REPLACEMENT PARTS FOR
1/4" FL CONNECTION 4-WAY MANIFOLD SET

MBL	Compound (low side) 3 1/8" gauge (R134a, R404A, R22 & R507A)
MBH	Pressure (high side) 3 1/8" gauge (R134a, R404A, R22 & R507A)
91253-E	Blue gauge protector
91503-E	Red gauge protector
95103	Manifold gauge set only, less hoses & couplers
42016	Service hose replacement depressor
42010	Service hose replacement gasket
90336	Shut-off valve female hose replacement gasket

Also Available...
ROTARY VANE DEEP VACUUM PUMPS

90060	1.5 CFM VACUUM PUMP (TWO STAGE)
90065	5 CFM VACUUM PUMP (TWO STAGE)
90067	7.5 CFM VACUUM PUMP (TWO STAGE)
90070-2V-110	10 CFM VACUUM PUMP (TWO STAGE)
90060-220	220 / 240V VACUUM PUMP)TWO STAGE)
90065-220	220 / 240V VACUUM PUMP (TWO STAGE)
90067-220	220 / 240V VACUUM PUMP (TWO STAGE)
90070-2V-220	220V VACUUM PUMP (TWO STAGE)
90060-J*	100V / 50HZ VACUUM PUMP (TWO STAGE)
90065-J*	100V / 50HZ VACUUM PUMP (TWO STAGE)
90067-J*	100V / 50HZ VACUUM PUMP (TWO STAGE)

* (Japanese Standard)

4-WAY-INST

Mastercool Inc.
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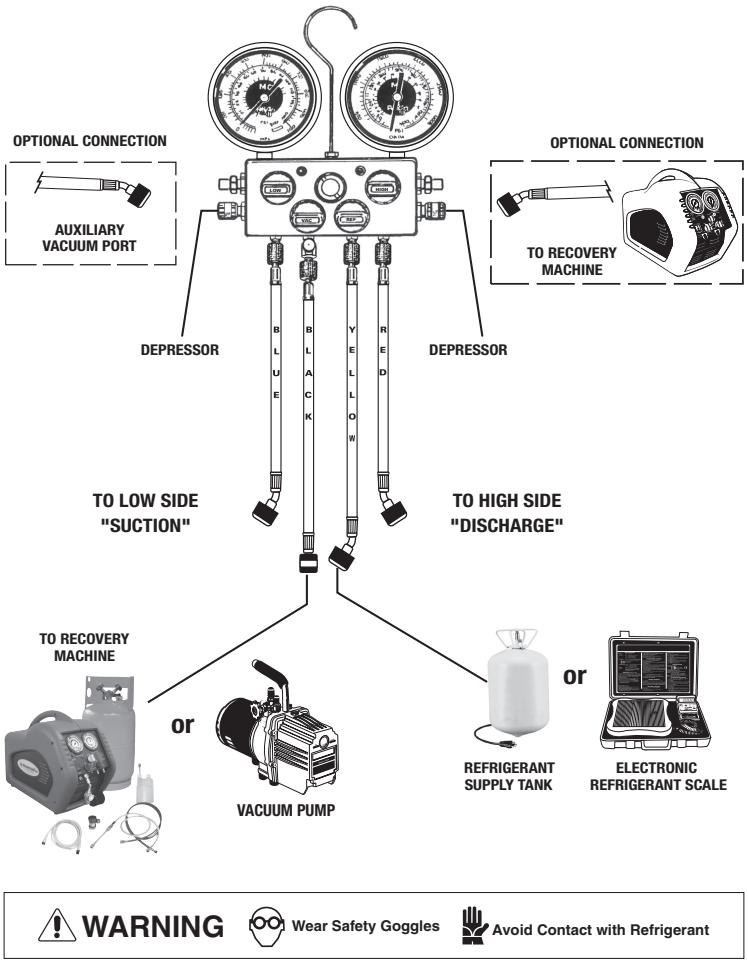
CHARGING & TESTING
ALUMINUM 4-WAY MANIFOLD



WARNING Wear Safety Goggles Avoid Contact with Refrigerant

PRE-SERVICE INSTRUCTIONS

- Do not use the gauge set on systems containing refrigerants other than those listed on the gauge face.
- Close all valves on the manifold by turning them horizontal to the block.

EVALUATING THE A/C SYSTEM

Detailed information on troubleshooting A/C systems can be found in Mastercool's **Automotive A/C Basic Service Training Manual #91183.**

To properly diagnose the problem in the A/C system, first check the overall system performance. Start the car and operate the A/C system on MAX. Note the interior temperature. Look for obvious indications of trouble such as a non-functioning compressor or a leaky hose or connection. Further testing includes monitoring the system's pressure and refrigerant flow, which can be done using the manifold gauge set.

WARNING - Be sure that the hand valves on the manifold gauge set are in the closed position. Always wear gloves and safety glasses when working with refrigerant!

1. Remove the protective caps at the high and low refrigerant ports. Make sure the ports are in fact used for the A/C system. Fuel injection ports are often mistaken for A/C ports. If unsure, consult the system flow diagram.
2. Connect the low side service hose (Blue) to the suction (Low) side of the A/C system.
3. Connect the high side service hose (Red) to the discharge (High) side of the A/C system.
4. Start the car, operate the A/C on MAX and monitor the High and Low side pressures. Depending on the pressures observed on the manifold gauge set, you must either add refrigerant or remove refrigerant and repair or replace a component.

ADDING REFRIGERANT (High side charging)

Close all manifold hand valves! Turn off the A/C system!

1. Connect the HIGH and LOW service hoses to the A/C system.
2. Connect a refrigerant supply to the black hose.
3. Open the REF hand valve and the valve of the refrigerant supply. Add a measured amount of refrigerant to the system using a calibrated heated charging cylinder or D.O.T. tank and electronic scale.
4. Close the REF hand valve and the valve on the refrigerant supply.

RECOVERING REFRIGERANT

Close all manifold hand valves!
MAKE SURE THE VALVE ON THE REFRIGERANT SUPPLY IS CLOSED!

1. Connect the HIGH and LOW service hoses to the A/C system.
2. Connect a recovery machine to the yellow hose from the manifold.
3. Operate the A/C system on MAX to warm the refrigerant and oil.
4. STOP the A/C system and shut off the car.
5. Open the HIGH, LOW and VAC hand valves and operate the recovery machine.
6. When the recovery machine stops and you are certain that no refrigerant remains, you can vacuum the system.

VACUUMING THE SYSTEM

Close all the manifold hand valves!

1. Connect the HIGH and LOW service hoses to the A/C system. The system pressure must be zero or less before vacuuming. If not, you must first recover any remaining refrigerant!
2. Connect the yellow hose from the manifold to the vacuum pump.
3. Open the HIGH, LOW and VAC valves on the manifold.
4. Start the vacuum pump and observe the LOW side gauge.
5. Evacuate the system for thirty minutes. Close the HIGH, LOW and VAC valves. Turn off the vacuum pump. Note the reading on the LOW side gauge. A drop in vacuum indicates a leak. Make necessary repairs and retest.

ADDITIONAL INFORMATION

- The additional port on the RIGHT side of the manifold is an auxiliary recovery port and can be used in conjunction with the REF, HIGH and LOW valves.
- The additional port on the LEFT side of the manifold is an auxiliary VACUUM port and can be used in conjunction with the VAC, HIGH and LOW valves.

HAND VALVE POSITIONS				
LOW	**VAC**	**REF**	**HIGH**	**OPERATION**
closed	closed	closed	closed	measure system pressure
opened	opened	closed	opened	recover refrigerant through black hose
opened	opened	closed	opened	vacuum system through black hose
closed	closed	opened	opened	high side charging
opened	closed	opened	opened	evacuate hoses using aux. recovery port

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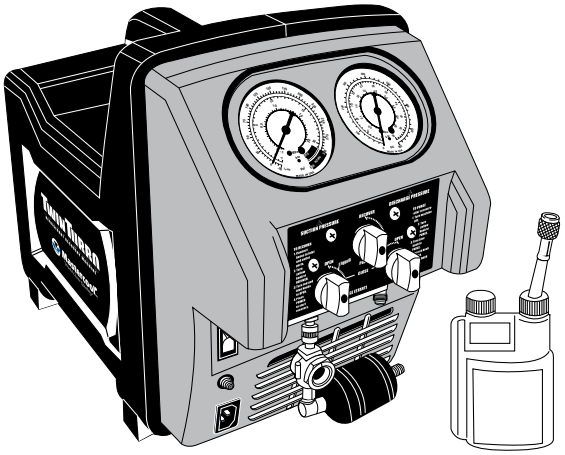
English

OPERATING INSTRUCTIONS

TWINTURBO
REFRIGERANT RECOVERY MACHINE

MODEL#–69350, 69350-220

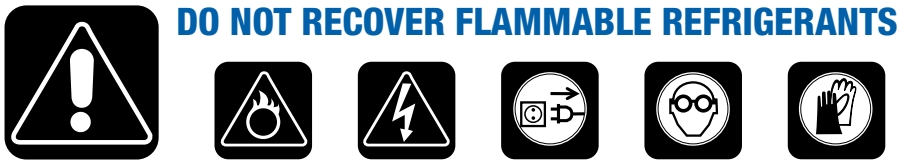


Note: Due to elevation and barometric pressure a small amount of pressure at inlet may be required to start the recovery machine.

SAFETY INFORMATION! READ CAREFULLY BEFORE USING MASTERCOOL RECOVERY SYSTEM!

1. This equipment is designed to be used by qualified service personnel. The operator of this equipment must be familiar with air conditioning and refrigeration systems. Do not attempt to operate this equipment until all safety instructions and operating instructions are read and understood.
2. Always use eye protection (safety goggles) and hand protection (gloves) when working with refrigerants. Other types of personal protective equipment should also be used.
3. All hoses used for interconnecting system should have shut off valves (manual or automatic) on both ends. Treat all hoses and connections with caution. Hoses or connections will contain liquid refrigerant or gas under pressure. Connect and disconnect fittings with caution.
4. Do not pressure test system with air. Some mixtures of air and refrigerant can be combustible or explosive.
5. Recovery tank contains liquid refrigerant under high pressure. Never over fill recovery tank. Tanks should be filled to a maximum of 80% of capacity only. Use only approved tanks for refrigerant recovery. An over filled tank can explode causing serious injury or death.
6. Do not breath refrigerant vapors and/or lubricant vapor or mist. Breathing high concentrations of these substances will cause severe health problems. Always use Recovery system in a well-ventilated area.
7. Do not use this Recovery System in the vicinity of spilled or open containers of flammable substances (gasoline, solvents, etc.).
8. If electrical extension cord is used, it must be 14 AWG or larger and 15240 mm (50 ft) maximum length. If lower amperage capacity extensions are used an over heat condition and fire hazard could occur.
9. Make sure system is electrically connected to a properly grounded power source. Always disconnect system from power source when servicing system.
10. Some governmental agencies require licenses or certification to work with refrigerants and this recovery equipment. Use this system only if operator has proper license or certification.
11. This recovery system is not to be used with any type of flammable refrigerant or flammable gas.
12. The Recovery System includes a fine screen filter at the inlet port. Since many recovery operations involve transferring contaminated refrigerants, the recovery system has an inlet in-line filter-dryer installed at the inlet port. Filter should be changed often or whenever contamination prevents proper operation of recovery system.

DANGER! - EXPLOSION RISK!!!



DO NOT RECOVER FLAMMABLE REFRIGERANTS

OPERATING GUIDE FOR DIRECT VAPOR OR LIQUID RECOVERY (Refer to fig.1)

Note: A) Connect hose (with coupler) to inlet filter. When Recovery Machine is in use, always keep hose and coupler assembled to inlet filter. When hose is removed from filter, use protective cap to seal inlet filter.
B) Connect another hose to recovery machine outlet. Valve end of hose is connected to recovery tank.

1. Make sure on-off switch is off, **"O"** pushed in. Connect system to grounded power connection.
2. Turn **INLET** (blue color) valve to **CLOSE** position. Turn center valve (yellow color) to **RECOVER** position.
3. Turn **OUTLET** (red color) valve to **OPEN** position.
4. Connect the hose from low side connection system to inlet port filter connection. Connect the hose from outlet port of recovery machine to vapor (gas) connection on recovery tank.
5. Purge air and moisture from system by bleeding lines, using vacuum pump or purge function of recovery system.
6. Open the vapor valve on the recovery tank.
7. Turn **INLET** valve on Recovery System to **OPEN**.
8. Turn on Recovery System (push power switch "I").

9. Observe operation of system. In rare instances “slugging” may be apparent (loud compressor noise or high vibration). If this condition is apparent turn inlet valve to **LIQUID** position. System can be run with this setting continuously. It is suggested that operator periodically turn inlet valve to **OPEN** position and check for proper operation of system. Best operation of the system is with inlet valve fully **OPEN.**
10. Recovery is complete when inlet reading is about 680 – 846mbar (20-25”) of mercury vacuum. Turn inlet valve to close position and turn power switch off. Recovery is complete.

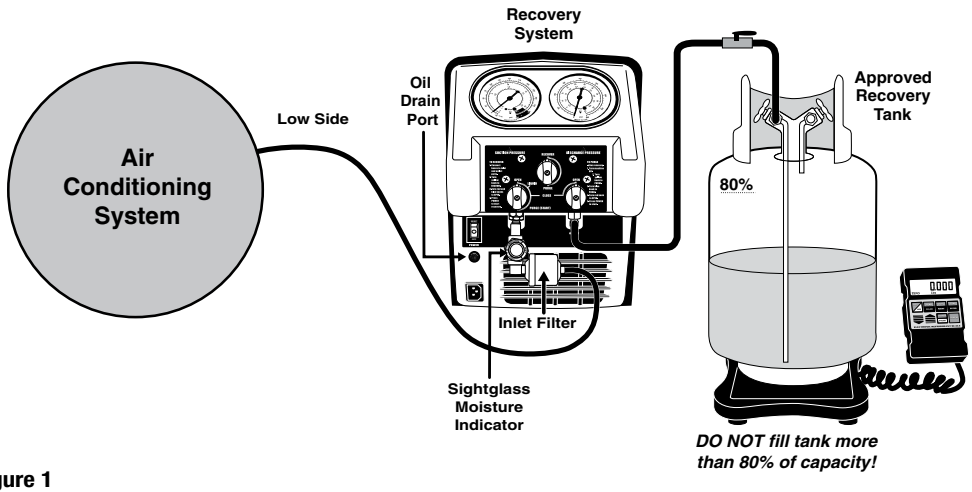


Figure 1

RECOVERY SYSTEM PURGE

1. Turn off power switch. Turn inlet valve to **PURGE** position. Turn center valve to **PURGE** position. Make sure outlet valve is in **OPEN** position. Start System.
2. Purge may take a few minutes as some liquid refrigerant may be in the Recovery System. The liquid must become vapor, which may require some time.
3. Shut **OFF** Recovery System. If System is to be used with the same refrigerant next operation, shut outlet valve and disconnect outlet hose. If venting of system is required, disconnect outlet hose to relieve residual pressure.
4. The inlet port has a fine screen filter. Remove inlet nut and clean screen filter after every use. A clean filter is very important for the proper operation of the System. Replace filter dryer whenever plugged or contaminated.

*** For optimal oil separation, throttle inlet valve to maintain about 40 PSI (2.7 Bar).**

TO DRAIN RECOVERED OIL

CAUTION! Do not cap the open bottle neck! The neck must remain open to vent pressure.

NOTE! The oil separator capacity is approx. 0.5 oz (14 g) which can recover normal car type A/C systems (up to 2 lb (1 kg) of refrigerant each). However, some systems deposit more oil in the separator due to high pressure or excessive oil in the system. Therefore it is recommended to drain oil after each use of the recovery machine and to turn off the unit and drain the oil separator for larger systems after every 11 lb (5 kg) of recovered refrigerant.

*** Please only attach oil bottle and hose to machine when draining oil. Hose and bottle should not be attached when machine is recovering refrigerant.**

1. Check pressure on recovery machine inlet pressure gauge. Pressure must be below 0.7 Bar (10 PSI), but above 0.1 Bar (2 PSI).
2. Insert short yellow hose into the “plastic bottle with two openings” which is supplied. Carefully attach the short yellow hose to the oil drain fitting on the recovery machine. As hose is tightened on fitting, oil will flow into container. (Hose is equipped with a depressor which will open core valve in oil drain fitting).
3. When oil has drained completely, disconnect the hose from the system. Unscrew the cap/hose from the bottle and dispose of the oil into an environmentally approved manner.

MAINTENANCE REQUIREMENTS

1. Replace filter if sight glass indicator is red/orange in color (as a reference, contaminated refrigerant may produce a color change in as little as 15 lb (7 kg) of refrigerant recovered.)
   The color change may be green/blue for dry condition when refrigerant is passing thru and red/orange in color for wet

condition.

2. Replace filter after recovering refrigerant from a known contaminated system.
3. Replace filter if excessive pressure drop is indicated. Difference of pressure gauge reading before and after filter.

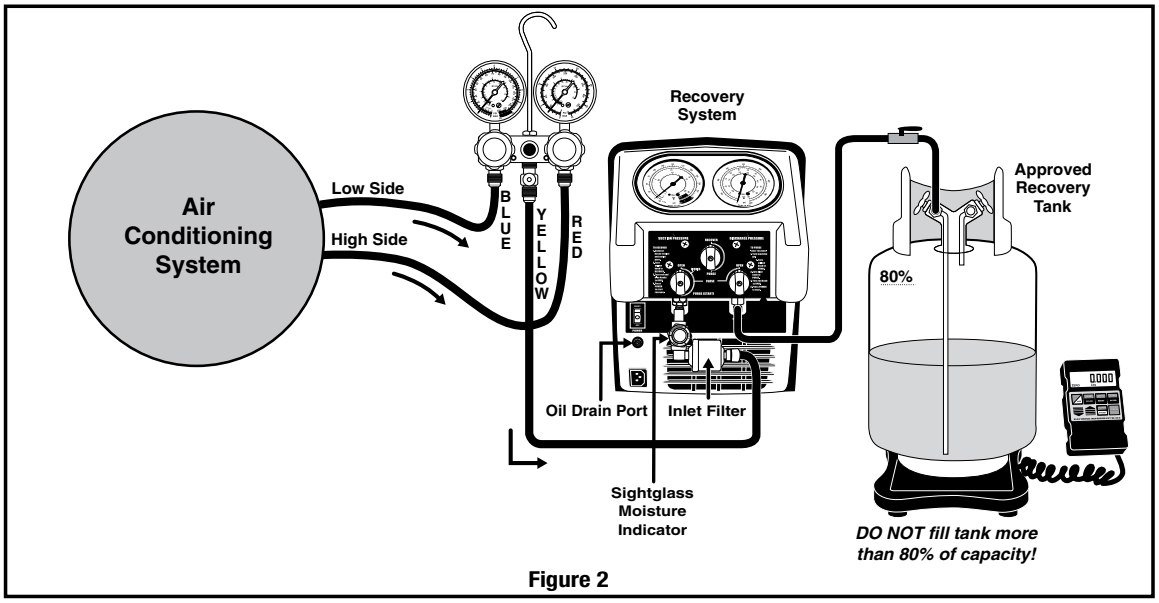


Figure 2

Connections for liquid/vapor recovery using manifold gauge set.

⚠ **WARNING:** This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

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English

OPERATING INSTRUCTIONS

Black Series

98210-BL

ELECTRONIC CHARGING SCALE with Bluetooth® Wireless Technology

WARNING
Wear Safety Goggles
Avoid Contact with Refrigerant

STATIC DISCHARGE: Climates in some parts of the world are conducive to creating static electric build up (ESD). Your scale has been designed to eliminate the damaging effects of ESD. In some extreme cases, ESD will be apparent on your scale by a lack of response or an inability to turn off the unit. In the rare case that this occurs, simply disconnect the battery, wait 1 minute and reconnect the battery. The scale will "reboot" itself and operate normally once the unit is
turned on.

OPERATING INSTRUCTIONS

KEY FUNCTIONS

ON/OFF: Turns unit ON or OFF

UNIT/SHIFT: UNIT - Select readout in lb, oz or kg
SHIFT - Move from one digit to the next, to edit display / To set up tank capacity

To Increase Value

To Decrease Value

CHARGE/PAUSE: CHARGE - To start CHARGE/RECOVERY mode
PAUSE - To pause and resume in CHARGE/RECOVERY mode

TARE/ENTER: TARE - zeros out display in BASIC CHARGING
ENTER - to start operation or input data

REPEAT: REPEAT - to repeat the last action

CLEAR: Use to clear the display during PROGRAM CHARGING ONLY! (DO NOT use CLEAR for any other function!)

CHECKLIST (Prior to 1st Use)

Your unit includes a 9V battery. Install battery. Place the platform on a flat surface and press **ON/OFF** button to turn unit on. The scale will begin counting down from 999999 to 000000! (DO NOT PRESS CLEAR while the unit is counting down). Proceed to BASIC or PROGRAM CHARGING.

*If the digital readout displays a small weight (±.5 Ounce or ±20 Grams) press and hold the **TARE/ENTER** button for approximately 30 seconds until you hear a DOUBLE BEEP. The scale will automatically zero out. Proceed to BASIC or PROGRAM CHARGING.

BASIC CHARGING

1. Remove platform from case.
2. Place platform on level surface.
3. Place DOT tank in center of platform and connect to liquid port. (Place disposable tank upside down).
4. Make sure the charging lines and the system are free of air using deep vacuum pump. (Follow vacuum instructions)
5. Press **ON/OFF** button to turn unit on.
6. Press **TARE/ENTER** button – display will read zero. (If the scale has not been used for a while press and hold **TARE/ENTER** button to reset the scale).
7. Open the valve to begin charging.
8. When the desired amount is reached, close the valve.
9. Press **ON/OFF** button to turn unit off.

PROGRAM CHARGING

1. Repeat steps (1 through 5) in BASIC CHARGING.
2. Press **CHARGE/PAUSE** button.
3. Set amount of refrigerant you want to charge using **CLEAR**, , **and SHIFT** buttons.
4. Press **ENTER** to start.
5. Open the valve on the tank to begin charging. Just before charging is completed, a short alarm will sound, allowing time to turn off supply.
6. When charging is completed, scale will sound an alarm again and display CH/END. Press any button to stop alarm. (If

the tank is empty and the charge is not complete, Empty Tank will display. Replace the tank and press **CHARGE/PAUSE** button to resume charging).

7. When the desired amount is reached, close the valve and press **ON/OFF** button to turn unit off.

This unit is preprogrammed for minimum and maximum cylinder weight 0 oz / 240 lbs (0 kg / 110 kgs).

* To change cylinder weight setting, refer to INSTRUCTIONS FOR SETTING TANK CAPACITIES.

REPEAT CHARGING

1. Press **REPEAT** to start charging the previously stored amount.
2. Open the valve.
3. When desired amount is reached, close the valve and press **ON/OFF** to turn unit off. (If scale was turned off, follow steps (1 through 5) of BASIC CHARGING, then follow the REPEAT CHARGING steps).

RECOVERY/RECYCLE

1. Repeat steps (1 through 7) in BASIC CHARGING.
2. Begin recycling.
3. The display indicates the amount of collected refrigerant when recycling is completed.

INSTRUCTIONS FOR SETTING TANK CAPACITY

1. Turn on the unit.
2. Select readout using **UNIT/SHIFT**.
3. Press **UNIT/SHIFT** again and hold down until the last digit in display "blinks".
4. Use **CLEAR**,  ,  and **SHIFT** to input the empty tank weight.
5. Press **ENTER** to set the empty tank weight. The display will read "GOOD" to confirm.
6. Use **CLEAR**,  ,  and **SHIFT** to input full tank weight.
7. Press **ENTER** to set the full tank weight. The display will read "GOOD - OUT" to confirm.
8. Press **ON/OFF** button to turn unit off.

CALIBRATION PROCEDURE

1. Turn on scale. When "HELLO" is displayed press **"TARE/ENTER"** and "CLEAR" together. Display will show " SEt-1."
2. Press **"TARE/ENTER."** Display will show SEt-11 for *kg calibration* (for *lb calibration* press and SEt-12 will display.) Press **"TARE/ENTER"** to confirm.
3. A "_ _ _ __" 5 digit number will display. Press  .
4. Place calibration weight on scale.
5. Press  . Press **"TARE/ENTER."** Number displayed must match calibration weight. If a digit needs to be changed, press **"UNIT/SHIFT"** to activate digit (digit will blink.) Press  or  to change number. Repeat until all digits are changed.
6. When number displayed agrees with weight on scale press **"TARE/ENTER."** Calibration is complete. Once "HELLO" appears you can remove the weight.

SPECIFICATIONS

- Capacity: 243 lbs (110 kgs)
- Accuracy: ≤±0.05% of reading
- Resolution: 0.05 lb/ 0.5 oz / 0.01 kg
- Automatic shut- off: (after 3 hrs)
- Operating temperature: 32˚F to 120˚F (0˚C to 49˚C)
- Battery life: Approximately 38 hrs

REPLACING THE BATTERY

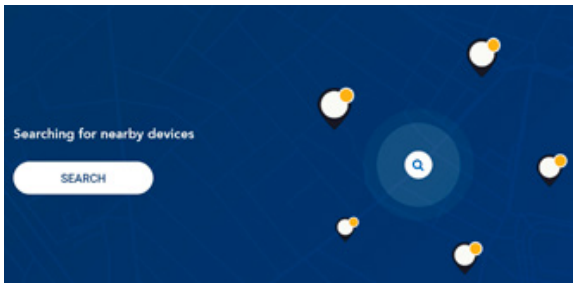
Replace 9V battery when a low-battery symbol prompts on LCD. **DO NOT OPERATE with a low battery.**

⚠ **WARNING:** Cancer and Reproductive Harm – www.P65Warnings.ca.gov

USING THE ELECTRONIC CHARGING SCALE AND THE MASTERCOOL CONNECT APP

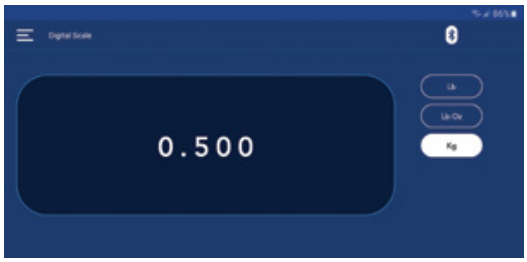
1. Download the Mastercool Connect app to a hand-held smart device from the Apple App Store or Google Play Store.
2. Press the power key on the digital scale keypad to turn on the device.
3. Launch the Mastercool Connect app on the mobile device.

4. Touch “SEARCH” on the Mastercool Connect app.

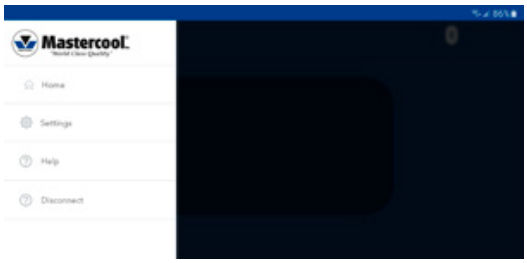


5. From the list of available devices, pick the digital scale. The digital scale should be listed as Raytac AT-UART.

6. Once the digital scale and the Mastercool Connect app are both linked the app will display what the digital scale is measuring in the selected unit.



7. To access the app options click on the main menu icon ( ) and the app options will be displayed.



8. To disconnect the app from the device open the main menu and hit disconnect.

NOTE: Incompatibility issues may arise due to changes passed down from Apple® and Android™ platforms. Mastercool will continually monitor and update our app software. Please contact us with any connectivity issues. Mastercool will not warranty claims based on app incompatibilities.

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English

OPERATING INSTRUCTIONS

BLACK SERIES
TWO STAGE DEEP VACUUM PUMP

90063-2V-110-BL, 90063-2V-220-BL, 90066-2V-110-BL, 90066-2V-220-BL, 90068-2V-110-BL, 90068-2V-220-BL, 90612-2V-110-BL, 90612-2V-220-BL, 90063-220-SVBL, 90066-2V-220SVBL, 90068-2V220SVBL, 90612-2V-220-SVBL

DO NOT ATTEMPT TO OPERATE WITHOUT USING OIL!!!
Use oil specifically refined for Deep Vacuum Pumps. Use of oil not refined for Deep Vacuum Pumps and/or operating with contaminated oil will void warranty.

WARNING:

1. Wear safety glasses
2. Do not evacuate combustible, explosive or poisonous gases.
3. Do not evacuate gases that corrode metal or react chemically with pump oil.
4. The temperature of evacuated gas shall not exceed 176˚F (80˚C) and ambient temperature shall be 41 - 140˚F (5 - 60˚C) in order to perform at maximum capacity.
5. Do not operate without oil.
6. Pump and motor can be extremely hot to the touch in high ambient temperature conditions.
7. Do not block vacuum pump exhaust.

CAUTION:

To reduce the danger of electric shock, keep the pump indoors and do not expose to rain.

DANGER:

1. Receptacle shall be well grounded, or else electric shock may be caused. Should power cord or plug require repair or replacement, do not use the pump. If you cannot fully understand grounding instructions and have doubt whether correct grounding is made, check with a professional electrician or service man. Do not change the structure of attached adapter connector.
2. When pulling out power plug, make sure to pull the plug rather than the wire.
3. Do not place anything on the power cord. It may damage the wire.
4. Do not use broken plug or socket.
5. Do not pull out power plug with wet hand.
6. Do not pull out, insert power plug or turn on power switch where flammable gases may be present.

OIL FILL

This vacuum pump has been tested at the factory and shipped with only trace amounts of oil. OIL MUST BE ADDED BEFORE OPERATING! Failure to add oil will damage cartridge and void warranty!

1. Make sure the oil drain valve located below the front casing is closed before attempting to add oil.
2. Remove the exhaust muffler from the top of pump and insert the oil bottle into the exhaust port.
3. Slowly add oil until oil level rises to the top of the Oil Level Line. Do not overfill with oil!
4. Replace exhaust muffler.

OIL CAPACITY:

3 CFM	6 CFM	8 CFM	12 CFM
8.5 oz. (250 ml)	15 oz. (440 ml)	19 oz. (570 ml)	18 oz. (536 ml)

CHECKING OIL LEVEL

1. Open the gas ballast valve (small brass fitting located next to the handle) one turn.
2. Start pump and run with intake port capped for about two minutes. Observe the oil level with the pump running. The oil level in the sight glass should be even with the level line.
3. If the level is low, open the intake port and run pump for 15 seconds, stop pump and observe oil level again. Add a small amount of oil as needed.

GAS BALLAST VALVE

The gas ballast valve must be opened 1/4 turn for the first part of the evacuation procedure. This will help to eliminate moisture and extend the life of the vacuum pump. After about two minutes close the valve and continue the evacuation procedure to reach ultimate vacuum. Failure to close the valve completely during the final evacuation will result in high

vacuum reading.

During the first stages of evacuation, vapors are highly concentrated. Unfortunately, some vapors will condense into a liquid and mix with the oil, thus reducing the oil's ability to produce a deep vacuum. The **GAS BALLAST VALVE** emits a controlled amount of dry air into the pump during compression to minimize this effect and keep oil relatively clean during the first part of the evacuation.

Periodically remove the Gas Ballast Valve Needle and clean or replace the O-ring. Clean mating surfaces and lightly coat with vacuum pump oil before securely re-tightening.

CHANGING OIL

In order to reach the deep vacuum required, your vacuum pump needs clean, moisture-free oil during evacuation. Dirty oil becomes a mixture of corrosive acids and water that effects the pump's ability to pull a deep vacuum. Left sitting in the pump, this sludge will rust and erode internal surfaces shortening the pump's life.

Care should be taken to avoid contact of oil with skin or eyes. OIL MAY BE HOT! Used oil should be properly disposed of in a leak-tight corrosion-resistant container according to local regulations.

1. After every evacuation, while the pump is warm and oil is thin, take a small sample of oil from the drain port.
2. If the oil is contaminated, drain the oil by placing the pump on a level surface and opening the oil drain valve. Catch the waste oil in a container and properly dispose of it.
3. If the pump has been sitting for more than one month, the oil is considered contaminated regardless of appearance and should be changed as outlined above.
4. To add oil, close drain, remove the exhaust muffler, fill to the Oil Level Line with fresh oil and replace the exhaust muffler.

INTAKE CONNECTIONS

After use, replace all caps and finger-tighten. Do not use caps with damaged or missing O-rings and always store vacuum pump with capped ports to prevent dirt and moisture contamination.

PUMP MOTOR

The PUMP and OIL must be above 30˚F (-1˚C). The line voltage must be equal to the rating on the motor nameplate ±10%. Normal operating temperature is approximately 160˚F (71˚C), which is HOT to the touch! Line voltage and ambient temperature will affect the normal operating temperature. Your vacuum pump is designed for continuous duty and will run for extended periods without overheating. The motor has an automatic resetting overload protection feature. If the motor will not restart the pump after shut-off, it may have opened the thermal protection. Disconnect the pump from the system, wait about 15 minutes for the motor to cool down and then try again.

SOLENOID VALVE AND GAUGE (OPTIONAL)

The solenoid valve opens when power to the vacuum pump is turned on. If the vacuum pump loses power for any reason, the solenoid valve will close, preventing vacuum pump oil from backing up into the system it is connected to. The vacuum gauge gives a rough indication of vacuum. It can be used for leak testing by setting the pointer at the current vacuum level and leaving the system closed for an extended period of time. For micron level readings, an electronic vacuum gauge (Mastercool's 98063-BT) is recommended.

LIMITED WARRANTY INFORMATION

The vacuum pumps are warranted against defects in material and workmanship for a period of one year. This warranty does not cover failure due to abuse, improper usage, or progressive wear and tear. Warranty becomes valid to the original owner and is effective on the purchase date. WARRANTY SERVICE IS PROVIDED THROUGH THE FACTORY ONLY. Please contact the service department toll free (1-888-825-6989) for parts, service concerns, or to obtain a return authorization number for warranty repair.

⚠ **WARNING:** This product can expose you to chemicals including Di (2-ethylhexyl) phthalate, lead and lead compounds, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov