8203

Hermetic/Capacitor Analyzer

Owner's Manual

WARNING: Because of the nature of this instrument it is very important that your read and fully undertand this manual before using the unit!

Congratulations!

You have just purchased a high quality handcrafted test instrument Your new Analyzer has been re-designed for convenience of operation, and is now covered by a full one year warranty.
We strongly suggest you take the time to familiarize yourself with the instrument while completely reading these operating instructions. **Please pay particular attention to the cautions and warnings.**

Cautions In Using:

Electricity can be hazardous when not understood or respected. This instrument is intended for use by qualified service personnel who fully understand the electrical operation of the equipment they are servicing. **Make sure that all power is disconnected from the equipment you are testing and that power to this instrument is not energized until all connections are made in accordance with these instructions.**
Never make a guess as to whether or not a wire is "live." **Any** wire should be checked for voltage between itself and ground before working on it. Never work on wires that are "live." A tool such as a Connectionless Voltage Detector is ideal for quickly identifying energized circuits. Whenever possible, remove the unit's fuses or turn off the main safety switches or circuit breaker before working on the unit's wiring. If power shut off is not in the area you are in, lock it off or tag it with a note to prevent unauthorized restoration of power.
For the chassis of this instrument to be grounded it **must** be plugged into a line voltage receptacle wired according to NEC standards. When using the cord adaptor, its black clip should be connected to the hot (for

120 VAC) or first hot leg (for 220 VAC). The green clip should be connected to the proper ground. Failure to connect the ground clip of the cord adapter, use of the power cord with an ungrounded receptacle, or defeating the ground plug may lead to hazardous voltage on the chassis and will automatically void the warranty. This instrument is protected with a master switch that has an ON/OFF switching capability. After final testing at the factory, this switch is placed in the "OFF" position. Connect the test leads, position the switches and hook up power according to instructions before placing this switch to the "ON" position. It is recomended, for safety, that this switch be kept in the "OFF" position whenever the instrument is not in use.

Ratings:

This unit is designed for temporary testing purposes only. This analyzer is designed for use on units up to 25 Amps, 110-240 VAC. Maximum test period is 2 minutes. Exceeding or ignoring these electrical ratings could be dangerous and will automatically void the warranty.

Care & Handling of your Instrument:

Unlike any of the mechanical tools you may own or work with, an electical testing instrument must be treated with care and respect in order for it to provide accurate and reliable service.
Dirt, grease and moisture can easily contaminate the switches, controls and meters - making them perform erratically. Common sense will tell you to keep your instrument clean and dry so as to avoid these problems. Prevent solvents and chemicals from coming into contact with the case, chassis or meter lens. Clean only with a damp cloth and mild detergent. Your instrument should be transported and handled with care, as bouncing, vibration and shock can damage meter movements or other more sensitive parts. Keep your unit in a protected place where it will be out of harms way. Periodically check the external condition of the wiring.

Applications:

- To check for continuity, shorts and grounds of unit windings.
- To start a compressor without relay, control or capacitor.
- To free stuck or frozen compressors.
- To check unit capacitors for shorts, leaks, grounds or opens.
- To read capacitance in mircrofarads.
- To measure amperage and voltage.
- To replace unit's start capacitor temporarily.
- To check and test all types of electrical appliances.

I Operation

***Note:** Model 8203 contains a neon power indicator lamp that lights when power and ground are connected correctly. Whenever model 8203 is connected correctly to any power source and the master switch is ON, the indicator lamp will come on and voltage may be present on the test leads.*

A. Voltmeter

1. Disconnect analyzer from external power source.
2. Put ammeter switch in **OFF** position. Put voltmeter switch in the 350v range. Turn master switch **OFF**.
3. Isolate black, red, white and green leads from each other and from ground.
4. Connect power supply cord of

analyzer to voltage source that is to be read. Use adaptor cord for any power source other than standard 120v. If power lamp is not lit, check breaker switch or hook-up for power and ground.
5. Turn master switch **ON** and read voltage. This is the line voltage supplied to the analyzer; if the reading is below 175v put voltmeter switch to 175v range for a more accurate reading.

B. Ammeter
1. Disconnect analyzer from external power source.
2. Put ammeter switch to **OFF** position. Put master switch to **ON** position.
3. Connect the apparatus under test to the red and black leads. Isolate the green and white leads from each other and from ground.
4. Connect the analyzer to a power supply of the correct voltage for the apparatus being tested. If the power lamp is not lit, check breaker or hook-up.
5. Put ammeter switch to **HI** position and read up to 25 amps. If the current draw on the ammeter is under 5 amps, switch to **LO** position.
Note: If reading of line voltage is desired while measuring amperage, place the voltmeter switch in the proper range.

C. Alternate AC voltmeter
1. Disconnect analyzer from external power source.
2. Isolate the power cord, the white lead and the green lead from each other and from ground.
3. Set the master switch to **OFF** and the ammeter switch to **HI.**
4. Set the volmeter switch to the scale desired and use the black and red test leads to measure AC voltage.

II To check a hermetically sealed unit for shorts & continuity:

1. Remove all external wiring from the terminals of the compressor.
2. Disconnect analyzer from external power source.
3. Set master, voltmeter and ammeter switches to **OFF.**
4. Connect red test lead to run post, white lead to start post, black lead to common post and green lead solidly to frame.
5. Connect analyzer to **120v power supply only.** Use cord adaptor for non-standard 120v power source. If power lamp is not lit, check breaker switch or hook-up for power and ground.
6. Move voltmeter switch to **350v** position and press start button. If any voltage is indicated, windings are shorted to unit's frame. **Unit should be replaced.**
7. Release start button. Put master switch to **REVERSE** position and note voltmeter, line voltage should be read. If no voltage is present, the windings are open and **the unit should be replaced.**

III To start a hermetically sealed unit:

1. Repeat steps 1 and 2 from B.
2. Connect red lead to run post, white lead to start post and black lead to common post. DO NOT CONNECT GREEN LEAD; ISOLATE IT FROM FRAME, GROUND AND OTHER LEADS.
3. Place voltmeter and master switches in **OFF** position. Place ammeter switch in **HI** position. Place capacitor selection switch in proper range. (See section VI).
4. Connect analyzer to power supply of correct voltage for the compressor, use adaptor cord for 220v or non-standard 120v supply. If power lamp is not lit, check breaker or hook-up.
5. Holding start button **IN,** put master switch in **ON** position. Release button when unit starts. Turn master switch **OFF.** If unit fails to start in two seconds, put master switch in **OFF** position.

DIAGNOSIS: If unit OPERATES satisfactorily, the trouble is with the capacitor, relay, control, overload or other external wiring. Put ammeter switch and voltmeter switch to desired ranges for further tests, including low voltage or high current draws (above rated amperage). If unit FAILS TO START, it may be stuck. See section IV. Disregard capacitor lamp while making this test.

IV To reverse a stuck or frozen unit:

1. Proceed as outlined in section III, steps 1 through 4.
2. Holding start button **IN**, quickly move master switch to **ON** and back to **OFF**, then move it quickly to **REVERSE** and back **OFF**. Repeat 3 times. If unit starts, release the start switch and let it run for approximately a minute, then turn it off.
3. Now try to start unit as outlined in section III step 5. If unit now fails to start **it must be replaced**. If circuit breaker trips, wait five minutes and reset.

V To test capacitors:

1. Disconnect capacitor from all external wiring including bleed resistors. **Discharge the capacitor with a bulb or bleed resistor.**
2. Disconnect analyzer from external power source. Make sure master, voltmeter and ammeter switches are **OFF.** Connect black and green test leads to capacitor. Isolate the white and red leads.
3. **CONNECT ANALYZER TO 120 VOLT POWER ONLY**, regardless of capacitor's rated voltage. (Do not connect to capacitors rated below 120 VAC). Check power lamp. If power lamp is not lit check breaker or hook-up.
4. Place ammeter switch in **HI** position and note reaction of the red lamp.
   a. If light goes on and then out, the capacitor has taken a charge. New capacitors may keep the light glowing for a few minutes.
   b. If no light, the capacitor is open.
   c. If light stays on, the capacitor is shorted.
   d. If light decreases but does not go out, the capacitor is leaking.

Do Not Press the Start/Capacity Button If the Red Lamp Remains On.

5. If the lamp goes **out**, press the start/capacity button for the microfarad reading. If the reading is below 110 mfds., move the ammeter switch to **LO** and press the capacity button again. Discard capacitors which vary more than 20% from their ratings.
6. Return ammeter switch to **OFF.** Unplug the unit & discharge the capacitor before removing the test leads.
7. If a replacement capacitor is needed but not available, the analyzer can be used as an emergency substitue to run the unit until a replacement can be obtained.

Do not plug the analyzer in.

   a. Connect the green and white test leads to the wires that normally go from the system wiring to the capacitor.
   b. Put the master switch to **ON** and set capacitor switch to the range needed. All other switches should be **OFF** or in the center position.

VI Capacitor Information:

A. 110 volt units up to 1/4 HP use 75-155 MFD range.
B. 110 volt units of 1/3 HP use 160-240 MFD range.
C. 110 volt units over 1/2 HP use 250-380 MFD range.
D. 220 volt units, use label rating.

COMPRESSOR TERMINAL COLOR CHART

UNIT MAKE	START	RUN	COMMON
Analyzer	W	R	B
Admiral	B	R	R
Airtemp	W	R	B
Carrier	W	R or T	B
Coldspot	W	R	B
Copeland	W	R	B
Crosley	B	W	R
Frigidaire	R	B	W
General Electric	W	G	B
Gibson	G	W	B
Grunow	R	W	B
Hotpoint	W	G	B
Kelvinator	W	R	B
Kel-Kold	W	G	B
Leonard	W	R	B
Norge	R	B	W
Philco	W	G or R	B
Servel	W	R	B
Stewart Warner	W	R	B
Tecumseh	W	R	B
Universal Cooler	W	R	B
Westinghouse	R	B	W
Zenith	R	W	B

VII Relay Wiring Information

G.E. Relay - Lead from post #1 goes to start. Lead from post #3 goes to run. Other post is common.

Delco Relay - Lead from post #S goes to start. Lead from post #M goes to run. Other post is common.

Limited Warranty and Repair Policy

This instrument is designed and produced to provide unlimited service. Should it become inoperative after the user has performed the recommended maintenance, a no-charge repair or replacement will be made to the original owner within one year of the date of purchase. This applies to all repairable instruments which have not been tampered with or damaged. This warranty does not cover consumable items such as batteries, tips and fuses, nor physical damage and wear to components such as probes, sensors and adaptors. For repair or customer service return the tool to the place of purchase.

Repaired tools will carry a 90-day warranty.