

WAECO
mobile solutions



Installing & Operating Manual

› **FRONT LOADING
COMPRESSOR REFRIGERATORS / FREEZERS**

CR SERIES



WAECO USA • Clinton, CT • www.waecousa.com

toc

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WAECO

Thank you for purchasing a WAECO CR series refrigerator. With proper installation, maintenance, and care your new refrigerator should give you many years of trouble-free service. WAECO USA would like you to know that, should any questions or problems arise during installation or operation of your new WAECO refrigerator, our Technical Support staff is at your service at (860) 664-4911. Our regular business hours are 8:00AM-5:00PM Eastern Standard (USA) Time.

The WAECO CR series refrigerator should not be modified in any way from its original form. Modification of the unit may be extremely hazardous and cause personal injury or property damage.

BEFORE INSTALLATION:

CAREFULLY unpack the box and make sure that your new refrigerator is sitting upright. Check the packing list and make sure that all parts are included in the box.

PLAN YOUR INSTALLATION:

There are many variables that make a difference between a good installation and a problem installation—a refrigerator that will give trouble-free service and one that will have erratic or short operational life. Many problems that arise with refrigerators can be traced to improper installation. A little planning can go a long way toward having a reliable source of refrigeration.

READ AND UNDERSTAND THE INSTALLATION AND OPERATION MANUAL COMPLETELY BEFORE ATTEMPTING INSTALLATION.

CAUTION!!

Hazards associated with working with electricity include electrical shock and burns. Be extremely careful when working with electricity. Know all hazards involved and observe safe practices to avoid injury.

Be careful when lifting refrigerators. Refrigerators can be heavy objects. Know how to handle objects of its size and weight and avoid twisting or unusual positions while supporting it.

Use care when moving and handling the refrigerator. Use gloves to prevent injury from sharp edges.

Refrigerant lines contain gases. Be very careful when handling. Do not kink, dent, or bend.

NEVER lift unit by the door or handle.

The refrigerator is not waterproof. Avoid direct contact with water.

Install away from heat sources in a dry and well-ventilated environment.

It is necessary to have a trained technician do the installation in wet areas.

Do not operate the appliance if it is visibly damaged.

DANGER: RISK OF CHILD ENTRAPMENT

Before you throw away your old refrigerator or freezer:

- Take off doors
- Leave the shelves in place so that children may not easily climb inside.

ELECTRICAL REQUIREMENTS

The Danfoss compressor is powered by an internal 12V DC brushless motor. The DC brushless motor operates by a continuous “loop” of information passing between the electronic module and the compressor. Because this operation requires a “clean” and uninterrupted supply of direct current power, it is recommended that the refrigerator have a direct connection to the battery.

Wiring it into the fusebox, terminal block, buss bar, or another electrical circuit, may subject the supply voltage to electrical “noise”, or interference, which may disrupt the informational loop and render the electronic module inoperative. Best practice is to wire the unit directly to the battery with an inline fuse on the positive (+) terminal.

The CR Series refrigerator should be wired on its own circuit. There should be no other electrical loads on the same circuit. Although 10 amp protection is sufficient, **15 amp is preferable.**

The appliance must be wired and grounded in accordance with ABYC guidelines. Refer to the guidelines on page 5.

Failure to provide a sufficient wire size will result in an unacceptable voltage drop and inability of the refrigerator to operate.

ABYC STANDARD - ABYC GUIDELINES E9 – DIRECT CURRENT

Conductor Sizes For 3 Percent Drop in Voltage

TOTAL CURRENT ON CIRCUIT IN AMPS	Length of Conductor from Source of Current to Device and Back to Source - Feet																		
	10	15	20	25	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170
	12 Volts - 3% Drop Wire Sizes (gauge) - Based on Minimum CM Area																		
5	18	16	14	12	12	10	10	10	8	8	8	8	8	8	8	8	8	8	8
10	14	12	10	10	10	8	8	8	6	6	6	6	4	4	4	2	2	2	2
15	12	10	10	8	8	8	8	8	6	6	6	4	4	2	2	2	1	1	1
20	10	10	8	6	6	6	4	4	4	2	2	2	2	1	1	0	0	0	2/0
25	10	8	6	6	6	4	4	2	2	2	1	1	0	0	0	2/0	2/0	2/0	3/0
30	10	8	6	6	4	4	2	2	1	1	0	0	0	2/0	2/0	3/0	3/0	3/0	3/0
40	8	6	6	4	4	2	2	1	0	0	2/0	2/0	3/0	3/0	4/0	4/0	4/0	4/0	4/0
50	6	6	4	4	2	2	1	0	2/0	2/0	3/0	3/0	4/0	4/0	4/0				
60	6	4	4	2	2	1	0	2/0	3/0	3/0	4/0	4/0							
70	6	4	2	2	1	0	2/0	3/0	3/0	4/0	4/0								
80	6	4	2	2	1	0	3/0	3/0	4/0	4/0									
90	4	2	2	1	0	2/0	3/0	4/0	4/0										
100	4	2	2	1	0	2/0	3/0	4/0											

TOTAL CURRENT ON CIRCUIT IN AMPS	24 Volts - 3% Drop Wire Sizes (gauge) - Based on Minimum CM Area																		
	10	15	20	25	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170
	24 Volts - 3% Drop Wire Sizes (gauge) - Based on Minimum CM Area																		
5	18	16	14	12	12	10	10	10	8	8	8	8	8	8	8	8	8	8	8
10	14	12	10	10	10	8	8	8	6	6	6	6	4	4	4	2	2	2	2
15	12	10	10	8	8	8	8	8	6	6	6	4	4	2	2	2	1	1	1
20	10	10	8	6	6	6	4	4	4	2	2	2	2	1	1	0	0	0	2/0
25	10	8	6	6	6	4	4	2	2	2	1	1	0	0	0	2/0	2/0	2/0	3/0
30	10	8	6	6	4	4	2	2	1	1	0	0	0	2/0	2/0	3/0	3/0	3/0	3/0
40	8	6	6	4	4	2	2	1	0	0	2/0	2/0	3/0	3/0	4/0	4/0	4/0	4/0	4/0
50	6	6	4	4	2	2	1	0	2/0	2/0	3/0	3/0	4/0	4/0	4/0				
60	6	4	4	2	2	1	0	2/0	3/0	3/0	4/0	4/0							
70	6	4	2	2	1	0	2/0	3/0	3/0	4/0	4/0								
80	6	4	2	2	1	0	3/0	3/0	4/0	4/0									
90	4	2	2	1	0	2/0	3/0	4/0	4/0										
100	4	2	2	1	0	2/0	3/0	4/0											

ABYC STANDARD - ABYC GUIDELINES E9 – ALTERNATING CURRENT/AMPERAGE

Temperature Rating of Conductor Insulation (Guidelines when using an AC/DC Converter)

Conductor Size (AWG)	60°C (140°F)		75°C (167°F)		80°C (176°F)		90°C (194°F)		106°C (221°F)		125°C (257°F)		200°C (392°F)
	Outside Engine Spaces	Inside Engine Spaces	Outside Engine Spaces	Inside Engine Spaces	Outside Engine Spaces	Inside Engine Spaces	Outside Engine Spaces	Inside Engine Spaces	Outside Engine Spaces	Inside Engine Spaces	Outside Engine Spaces	Inside Engine Spaces	Outside or Inside Engine Spaces
18	7.0	4.1	7.0	5.3	10.5	8.2	14.0	11.5	14.0	11.9	17.5	15.6	17.5
16	10.5	6.1	10.5	7.9	14.0	10.9	17.5	14.4	17.5	14.9	21.0	18.7	24.5
14	14.0	8.1	14.0	10.5	17.5	13.7	21.0	17.2	24.5	20.8	28.0	24.9	31.5
12	17.5	10.2	17.5	13.1	24.5	19.1	28.0	23.0	31.5	26.8	35.0	31.2	38.5
10	28.0	16.2	28.0	21.0	35.0	27.3	38.5	31.6	42.0	35.7	49.0	43.6	49.0
8	38.5	22.3	45.5	34.1	49.0	38.2	49.0	40.2	56.0	47.6	63.0	56.1	70.0
6	56.0	32.5	66.5	49.9	70.0	54.6	70.0	57.4	84.0	71.4	87.5	77.9	94.5
4	73.5	42.6	87.5	65.6	91.0	71.0	94.5	77.5	112.0	95.2	119.0	105.9	126.0
3	84.0	48.7	101.5	76.1	105.0	81.9	108.5	89.0	126.0	107.1	136.5	121.5	147.0
2	98.0	56.8	119.0	89.3	122.5	95.6	126.0	103.3	147.0	125.0	157.5	140.2	168.0
1	115.5	67.0	136.5	102.4	147.0	114.7	147.0	120.5	171.5	145.8	185.5	165.1	196.0
0	136.5	79.2	161.0	120.8	171.5	133.8	171.5	140.6	199.5	169.6	213.5	190.0	227.5
00	157.5	91.4	185.5	139.1	199.5	155.6	199.5	163.6	231.0	196.4	248.5	221.2	259.0
000	182.0	105.6	217.0	162.8	231.0	180.2	231.0	189.4	269.5	229.1	287.0	255.4	301.0
0000	210.0	121.8	252.0	189.0	269.5	210.2	269.5	221.0	311.5	264.8	332.5	295.9	357.0

VENTILATION REQUIREMENTS

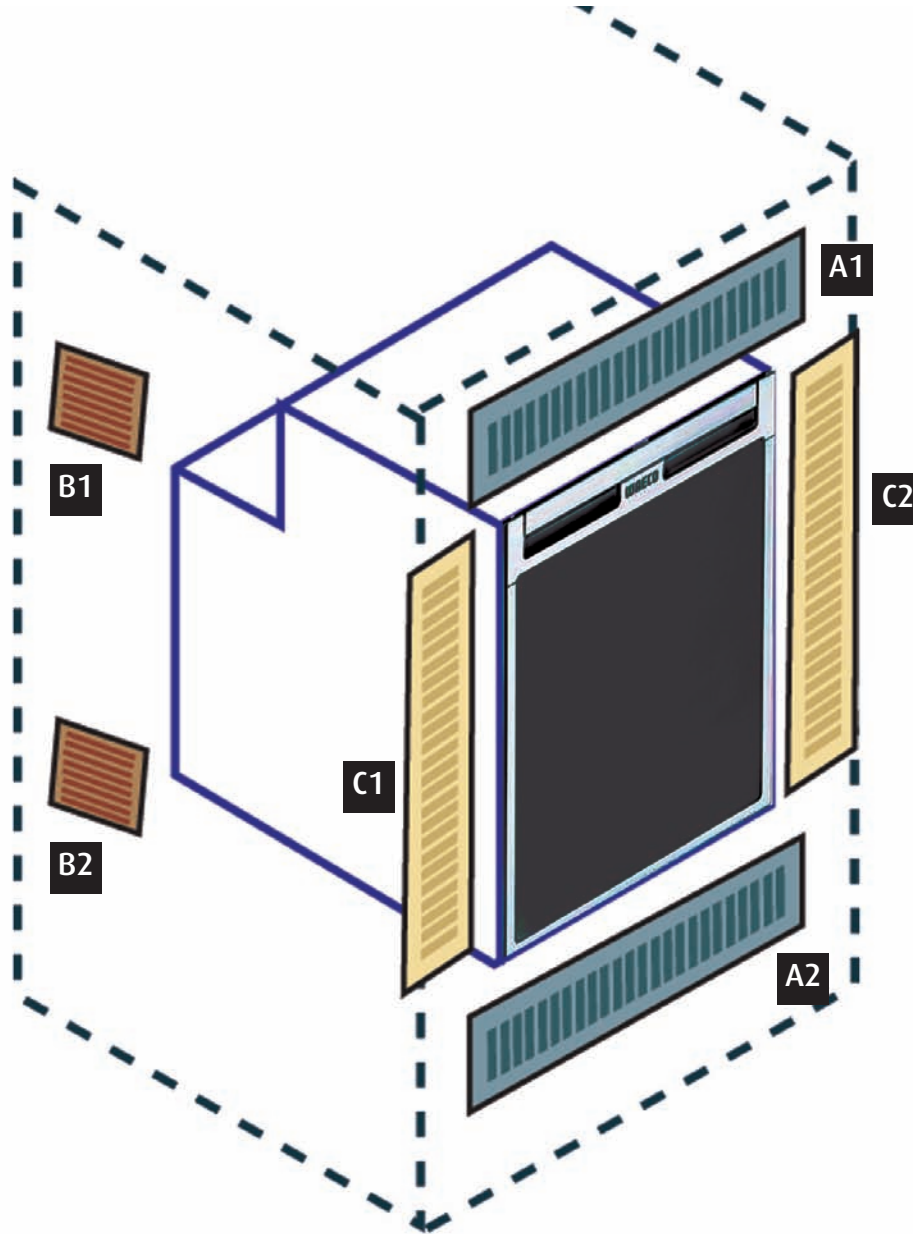
IT IS ABSOLUTELY ESSENTIAL that a refrigerator have adequate ventilation. It is not possible to have too much ventilation—more is better. A refrigerator removes heat from the refrigerated space and gives it off from the coils (condenser) on the back of it. The heat **MUST** be removed from the rear of the refrigerator or it cannot operate correctly.

Inadequate ventilation may lead to premature compressor failure or inability to cool.

There must be a minimum of 36 square inches of opening to the outside for ventilation.

Two openings are recommended.

Ventilation air must have a clear path in (supply) and a clear path out (discharge). There must be a minimum of 4" clearance behind the refrigerator. Use combinations of A1 and A2, B1 and B2, or C1 and C2 as shown below.



NOTE:

1. The goal is to provide as much ventilation as possible.

2. Not all vents are created equal. Vents should be positioned so that they allow warmer air to escape from the top, and be replaced by cooler air entering from the bottom.
3. This drawing is not to scale. Vent size is exaggerated for clarity.

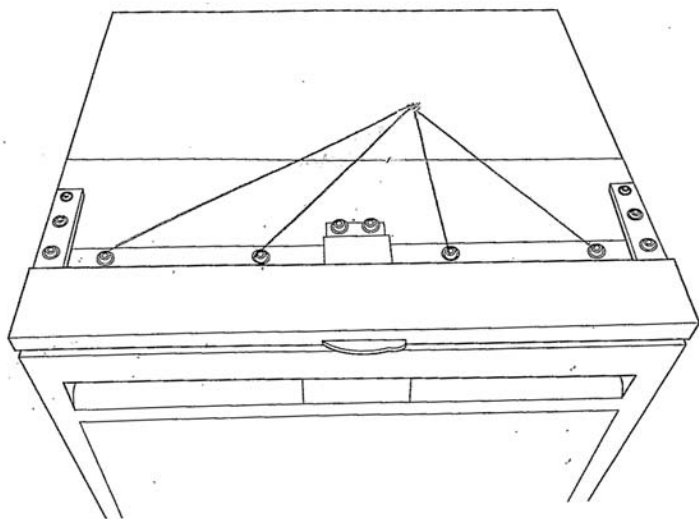
INSTALLATION

The refrigerator must sit upright for a minimum of 8 hours prior to installation.

1. PREPARE THE SITE

The refrigerator should have solid, secure support. Measure the opening to determine that you have proper clearance for installation. Do not install in direct sunlight or near a gas stove, heater, or other heat-generating device. Avoid hot water lines or warm air ducts.

Make sure that sufficient electrical power is connected per electrical requirements as outlined. Also be sure that you have enough length of wire to service the unit outside of the opening. Ensure that sufficient ventilation is provided per ventilation requirements. Verify that there is enough room for the door to swing open with the refrigerator installed.



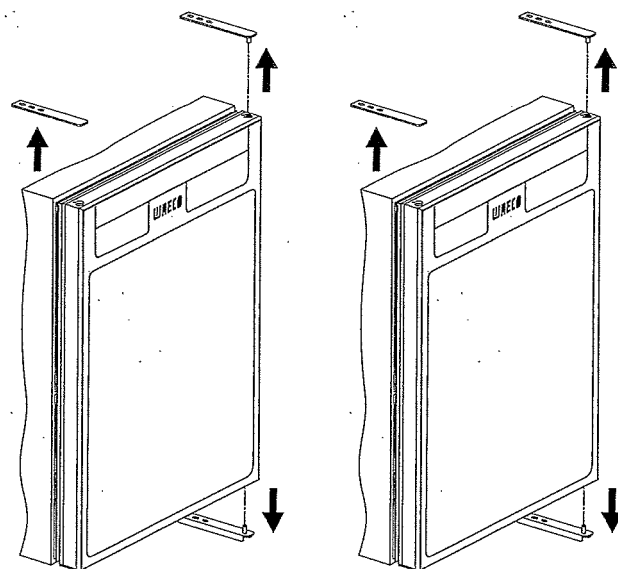
2. REVERSING THE DOOR SWING.

If the door needs to be reversed, remove the four screws that hold the top front panel.

Remove the top hinge and panel support by the three screws that hold them. Lift door off bottom hinge.

Remove the bottom hinge by three screws.

Reinstall the bottom hinge on the opposite side. Install door on hinge and close door. Reinstall top hinge and panel support on opposite sides. Reinstall top panel.



3. INSTALL THE FRAME.

Use the screws provided.



INSTALLATION

4. MAKE ELECTRICAL CONNECTIONS.

Make sure that polarity (+ and -) is correct on DC circuits.



5. CAREFULLY INSERT UNIT INTO OPENING

until frame is against it.



6. INSERT SCREWS THROUGH SCREW OPENINGS IN FRAME and screw into cabinet.



INSTALLATION

7. ALLOW REFRIGERATOR TO SIT FOR 1 HOUR BEFORE STARTING.

WAECO cannot be held responsible for any deviation from this set of instructions. We trust that you will enjoy your new WAECO refrigerator for many years to come.

8. START REFRIGERATOR AND CHECK FOR PROPER OPERATION.

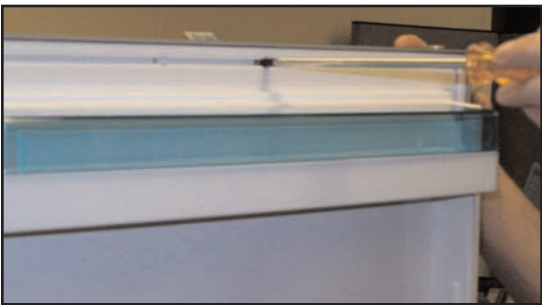
If, on the rare chance that your WAECO refrigerator doesn't work correctly, verify that the installation was not at fault by removing refrigerator and allowing it to rest in an open space for an hour. Connect it directly to a fully charged battery and turn it on. If the problem persists, contact WAECO at (860) 664-4911 before attempting repair.

CHANGING THE FACE PANEL

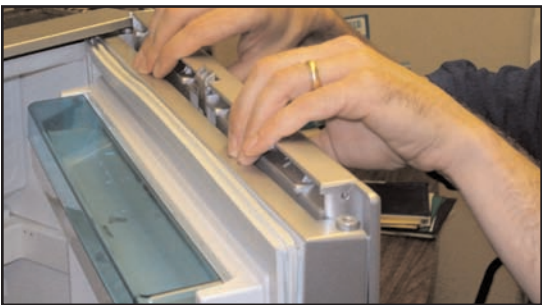
Unlike most front-loading refrigerators, the CR Series face panel is interchangeable—while installed in your boat or RV.



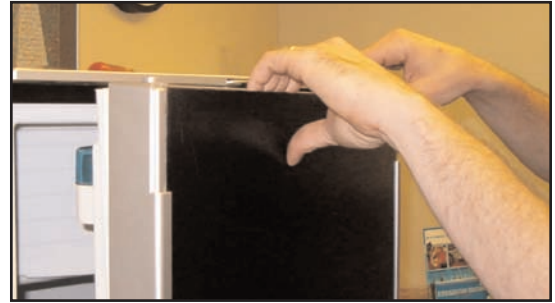
1. Remove rubber gasket from the interior door.



2. Unfasten the 4 screws with a Phillips screwdriver.



3. Remove the door handle by pulling up until the entire piece is removed.



4. Remove the existing face panel, by sliding it up and out of the door surround.

{Photo right shows unit with the face panel completely removed.}



5. Slide in preferred face panel.

Re-insert door handle, re-fasten 4 screws, re-apply rubber gasket.



OPERATION

BEFORE STARTING YOUR NEW REFRIGERATOR:

1. Clean with a mild cleaner to assure cleanliness and proper hygiene.
2. Assure that it is only operated within the design parameters. The design temperature range is 14–110°F (-10–43°C) and not above 90% relative humidity.

DOOR VENT:

In the **VENT** position the door will be held open slightly to allow for air circulation to the inside of the refrigerator. This will help to inhibit the growth of mold and mildew and avoid odors



OPERATION

SETTING THE THERMOSTAT:

The thermostat regulates the temperature of the refrigerator. It is calibrated by numbers, "1" being the warmest setting and "7" being the coldest setting.

Start with the thermostat at a setting midway between the warmest and coldest setting. After unit has reached a steady-state temperature, adjust as necessary to maintain desired temperature. Do not make large adjustments. Adjust by small increments and let cool before readjusting.

Understand that, should you load your refrigerator excessively with warm food, it may take a very long time to cool down. To avoid this "hot pull-down" condition, pre-cool food, or add only small amounts of warm food at a time. This will avoid unnecessary work by the cooling system and save on your energy usage.

LED:

There are **TWO LED'S** next to the thermostat. One is green during normal operation. The other flashes a specific number of times in sequence to indicate a problem that prevents operation. The number of flashes in a row indicate the fault.



TROUBLESHOOTING LED FLASHES

NUMBER OF FLASHES	FAULT	POSSIBLE CAUSE
1	Supply Voltage	The supply voltage is outside of the set range.
2	Excessive Fan Current	The fan loads the electronics unit with more than 1A.
3	Motor does not Start	The rotor is jammed. The pressure difference in the cooling system, is too high. (> 5 bar)
4	Speed too Low	If the cooling system overloaded, the minimum speed of the motor of 1850 RPM can not be maintained.
5	Overheating of the Electronics Unit	If the cooling system is loaded too heavily or the temperature is set too high, the electronics can overheat.

OPERATION

DEFROSTING THE REFRIGERATOR:

The CR series refrigerator is not frost-free. When operating over a period of time, the freezer will build-up with ice and requires periodic defrosting. Failure to defrost the refrigerator will result in an excessive build-up of ice and a reduced ability to absorb heat (cool).

Shut off the power at the thermostat and open the door to allow warm ambient air to melt the ice.

DO NOT add heat to speed defrost as this may distort components of the refrigerator.

Gather the water in the drip pan, located at the rear bottom of the unit. Empty pan when full. Alternatively, the drip pan can be removed and a drain hose connected to the drain (underneath the rear of the unit) to drain the water.

CLEANING:

Should your refrigerator become dirty, clean with a clean, damp cloth.

DO NOT use abrasive cleaners or cleansers as these can damage the refrigerator.

DO NOT allow electronic components to get wet.

DO NOT use sharp objects or scrapers to loosen stuck objects or ice.

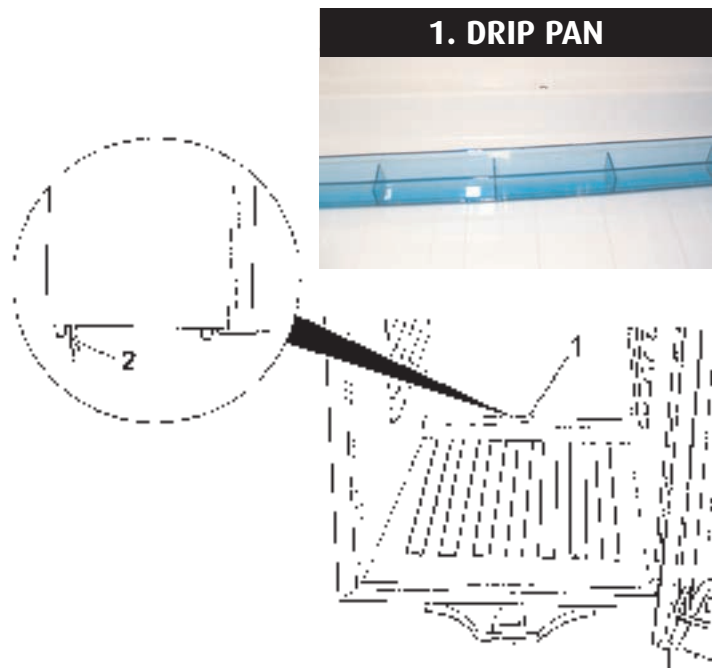
CHANGING THE LIGHT BULB:

Turn off power to the unit.

Pull off the light bulb cover, located behind the thermostat inside the unit.

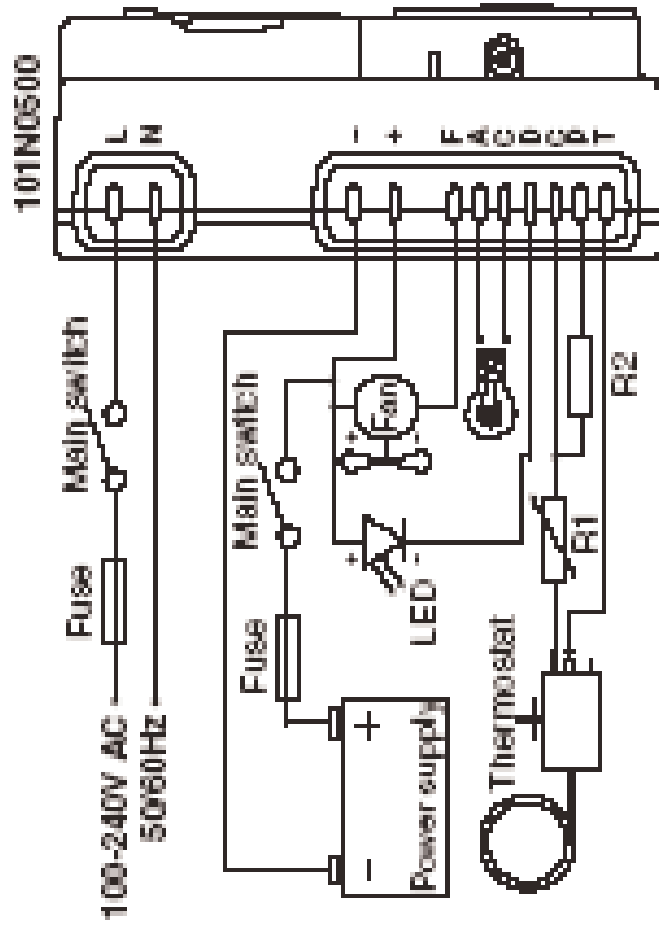
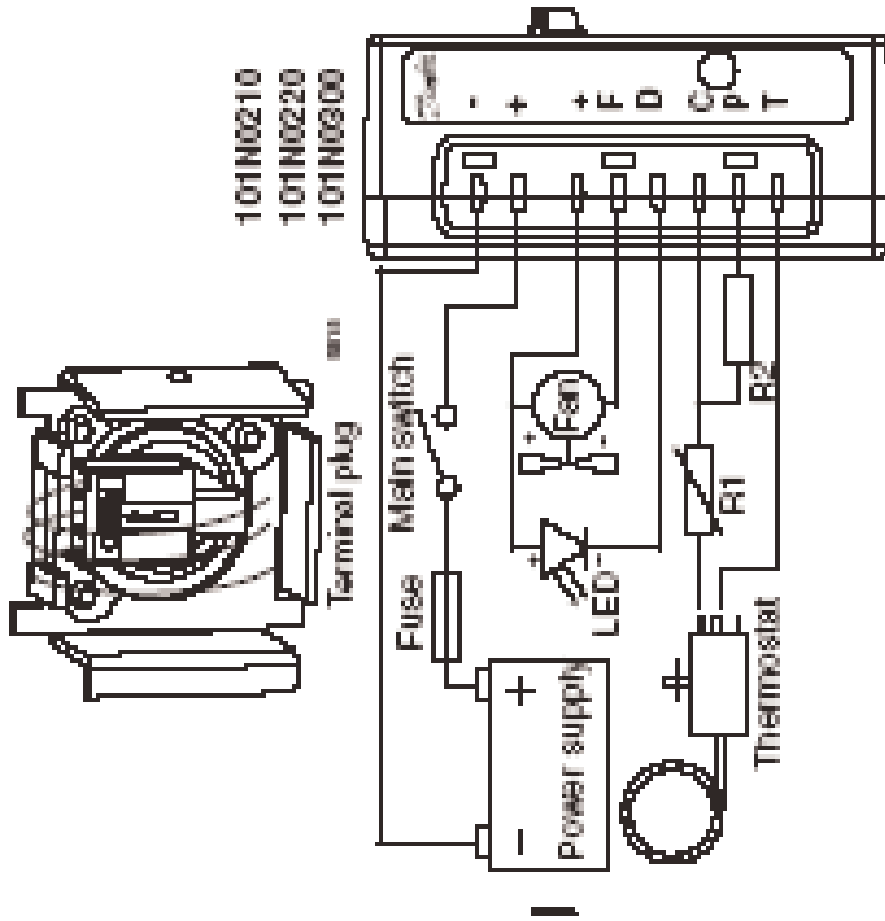
Remove the light bulb from the two prongs at each end of the bulb.

Replace with a new bulb by pushing each end of the bulb between the two prongs. Snap cover back into place.



WIRING DIAGRAM

The CR Refrigerator/Freezer is wired according to one of the following diagrams, depending on the compressor module number located on the face of the module.



IMPORTANT INFORMATION • LIMITED WARRANTY

WAECO USA LIMITED WARRANTY

WAECO USA, Inc. warrants its products to be free of defects in materials and workmanship for the periods specified below subject to the specified conditions and limitations. *What WAECO Will Do:* Repair or replace (choice of remedy at Company's discretion) goods or parts that prove to be defective in materials or workmanship after examination by a factory representative or authorized service dealer.

How long Coverage Lasts: COMPRESSOR PRODUCTS

Labor: WAECO will pay for necessary labor from an authorized service agent for one year from date of purchase or third party installation. For OEM factory installed products the duration is one year from the date of purchase of the vehicle (vessel).

Parts: WAECO will pay for necessary parts for two years from the date of purchase or third party installation. For OEM factory installed products the duration is two years from the date of purchase of the vehicle (vessel).

What is Not Covered:

1. Damages due to accident, misuse, abuse, normal wear, improper installation, lack of reasonable and necessary maintenance, transportation, corrosion, tampering, improper repair, unusual physical or electrical stress or recharging of the coolant.
2. Electric light bulbs or replaceable fuses.
3. Failures due to use of the products in applications for which they are not intended.
4. Warranty coverage following unauthorized service.
5. Warranty coverage following transfer of ownership.

How State Law Relates to this Warranty:

This warranty gives you specific legal rights, and you also have other rights, which vary from State to State.

THERE ARE NO OTHER WARRANTIES OF MERCHANTABILITY, FITNESS FOR PURPOSE OR ANY OTHER KIND. ANY EXPRESSED OR IMPLIED ARE HEREBY DISCLAIMED AND EXCLUDED. THE COMPANY SHALL NOT BE LIABLE FOR CONSEQUENTIAL DAMAGES TO YACHTS, EQUIPMENT OR OTHER PROPERTY OR PERSONS DUE TO ANY FAILURE OF WAECO USA PRODUCTS. THIS WARRANTY IS EXPRESSLY PROVIDED IN LIEU OF ALL OTHER WARRANTIES EITHER EXPRESSED OR IMPLIED.