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SO-LOW
ENVIRONMENTAL
EQUIPMENT COMPANY

ETL LISTED US
Intertek

LAB CHEST FREEZER

CH SERIES

INSTRUCTIONS

USER MANUAL

WARNING: READ BEFORE CONTINUING	
To reduce the risk of fire, electric shock or injury to persons using this freezer, read all instructions and follow basic safety precautions before using the unit, including the following:	
⚡	Do not modify the plug provided with the freezer. If it will not fit the outlet, have a proper outlet installed by a qualified electrician.
⚠	Do not position equipment so it is difficult to disconnect from the power supply. freezer must be at least 6” away from any wall or object on any side.
⚠	While under warranty, do not attempt to repair or replace any part of the freezer for servicing without first contacting the So-Low Service Department.
SAVE THESE INSTRUCTIONS	

So-Low Environmental Equipment Company
10310 Spartan Drive
Cincinnati, OH 45215-1221
Tel: 513-772-9410
http://www.so-low.com

For customer service:
Email: sales@so-low.com

For parts replacement:
Email: parts@so-low.com

For technical support:
Email: service@so-low.com

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SYMBOLS AND STARTING INSTRUCTIONS

Explanation

MEANING OF ILLUSTRATED SYMBOLS

ILLUSTRATED SYMBOLS

Various symbols are used in this safety manual in order to use the unit without danger of injury and damage of the unit. Be sure that you understand the warnings and cautions in this manual before operating the unit.



CAUTION

BLACK WITH YELLOW BACKGROUND
LIGHTNING BOLT
CAUTION, RISK OF ELECTRICAL SHOCK



WARNING

BLACK WITH YELLOW BACKGROUND
EXCLAMATION POINT
CAUTION, REFER TO ACCOMPANYING DOCUMENTS

STARTING INSTRUCTIONS

1. Move the freezer to an indoor location and plug the freezer into an appropriate outlet with an adequate power supply. Consult your maintenance department for additional information on the proper electrical configuration for this unit.

2. Once plugged in, the compressor(s) will start to operate and pull down to the setpoint on the temperature control. The default setpoint varies depending on model. Consult your freezer manual for specific information regarding setpoint.

3. Allow the freezer to reach the setpoint temperature. Depending on the size of the unit, this may take up to 12 hours.

4. Product can now be loaded into the freezer for storage

5. **To prevent overloading the cooling system, product should be loaded gradually, in batches. Allow the temperature to recover to setpoint before the next batch of product is loaded into the unit.**

Unit Information

PRE-INSTALLATION INFORMATION

RANGE OF ENVIRONMENTAL CONDITIONS FOR WHICH THIS EQUIPMENT IS DESIGNED

1. Indoor use.
2. Altitude up to 2000m.
3. Ambient temperatures 15°C to 30°C (60°F TO 85°F)
4. Recommended humidity range of 30% to 90%.
5. Mains supply fluctuations up to -5% to +10% of the nominal voltage.
6. Transient over-voltages typically present on the mains supply (overvoltage category II). Pollution degree 1.



WARNING

DURING OPERATION THIS UNIT MUST REMAIN IN UPRIGHT POSITION. DURING TRANSPORATION UNIT MUST NOT BE TIPPED MORE THAN 45° FROM UPRIGHT POSITION.



CAUTION

UNPLUG UNIT AND SWITCH OFF ELECTRICAL BREAKER BEFORE ANY TECHNICAL SERVICE IS PERFORMED.



CAUTION

COVERS ON BACK / SIDE OF FREEZER MAY ONLY BE REMOVED BY AUTHORIZED PERSONNEL. FAILURE TO RE-INSTALL COVER COULD RESULT IN HAZARD.



CAUTION

ONLY PLUG THIS UNIT INTO THE PROPER OUTLET. DO NOT ATTEMPT TO MODIFY PLUG IN ANY WAY. IMPROPER USE OF THE ELECTRICAL PLUG WILL VOID WARRANTY.

VOLTAGE	AMPERAGE	PLUG
115 VOLTS 60 HERTZ 1 PHASE (SUPPLY VOLTAGE SHOULD NOT VARY MORE THAN 5% FROM SERIAL PLATE RATINGS.)	**15 AMP** **DEDICATED LINE**	 **NEMA 5-15**

PREVENTATIVE MAINTENANCE

CLEANING PROCEDURE

Wipe down the exterior of the freezer with a soft cloth and/or general spray type polish. Do not use corrosive cleaners/chemicals on the exterior.

If frost builds up in the chamber, a bucket and ice-scraper can be used to remove ice. If excessive ice builds up, the unit can be defrosted (see below).

DEFROST PROCEDURE

1. Remove any product in the freezer, and temporarily store it in a back-up freezer or elsewhere.
2. Unplug the freezer, and fully open the freezer front door / lid.



ATTENTION

FOR UPRIGHT UNITS, IT IS IMPORTANT TO PROTECT THE CONTROL FROM DRIPPING WATER. PLACE A CLOTH OR TOWEL ON THE LEADING EDGE OF THE COOLING CHAMBER ABOVE THE CONTROL TO DEFLECT / ABSORB WATER THAT COULD DRAIN ONTO THE CONTROL.

3. Air out the freezer, allowing the unit to reach room temperature for at least 12 hours. Using fans to blow air into the unit is recommended.
4. Take a rag and wipe up all the excess water in the unit (melted frost).
5. Close the unit and plug the unit in to activate the start-up process.

PLEASE CONSULT THE START-UP INSTRUCTIONS ON PAGE 1 FOR UNIT STARTUP

6. Once the desired temperature is reached, you may slowly begin to add your product back into the unit.



ATTENTION

IT IS RECOMMENDED TO SLOWLY RE-ADD YOUR PRODUCT INTO THE FREEZER TO PREVENT AN EXTREME LOAD ON THE COMPRESSORS, WHICH COULD SHORTEN FREEZER LIFE EXPECTANCY.

DRY CONTACT RELAY / PART NUMBERS

RELEASE OF LIABILITY

IF THIS EQUIPMENT IS BEING USED TO STORE IRREPACEABLE AND / OR HIGH VALUE PRODUCTS, YOU (THE USER) MUST TAKE PROPER PRECAUTIONS TO ENSURE THAT PRODUCT IS NOT LOST.

SO-LOW WILL NOT BE ACCOUNTABLE FOR, CONSENT TO HAVE OBLIGATION TO, OR INHERIT RESPONSIBILITY OF PRODUCTS STORED INSIDE THE FREEZER / REFRIGERATOR REGARDLESS OF WARRANTY STATUS. THIS PERTAINS TO ANY DIRECT OR INDIRECT LOSSES (PHYSICAL OR ECONOMIC). PLEASE CONSULT THE WARRANTY OF THIS PRODUCT FOR ADDITIONAL CLARIFICATION.

Before this Refrigerator / Freezer can be placed into operation, complete all of the applicable tasks listed below. You may need to consult your own departments for additional assistance with these tasks.

1) Connect your company remote alarm contacts system (see below), or auto dialer, to the refrigerator's alarm system.

2) Develop an emergency backup plan, and designate a separate back-up refrigerator, freezer, or similar appropriate device to store your product, if this equipment has an unforeseen issue.

DRY CONTACT RELAY

The dry contact relay is a terminal strip located on the side of the freezer.

RATING OF THIS CONNECTION:

2A 125 VAC

2A 30 VDC

RED – NORMALLY CLOSED
WHITE – COMMON
BLUE – NORMALLY OPEN

TEMPERATURE CONTROL PARTS	PART #
DIXELL CONTROL	**XR60-CH**
TEMPERATURE PROBE FOR DIXELL CONTROL	**DH-PROBE**
RELAY	**DH-RELAY**
COMPRESSOR FAN	**CH-FAN**

CONTROL PROGRAMMING

CONTROL ADJUSTMENTS

HOW TO CHANGE UNITS FROM °C to °F

1. Press and hold the key to change units from °C to °F.

HOW TO SEE THE MININMUM (MIN) TEMPERATURE

1. Press and release the **(DOWN)** key.
2. The "Lo" message will be displayed followed by the minimum temperature recorded.
3. By pressing the **(DOWN)** key again or by waiting 5s the normal display will be restored.

HOW TO SEE THE MAXIMUM (MAX) TEMPERATURE

1. Press and release the **(UP)** key.
2. The "Hi" message will be displayed followed by the maximum temperature recorded.
3. By pressing the **(UP)** key again or by waiting 5s the normal display will be restored.

HOW TO RESET THE MAX AND MIN TEMPERATURE RECORDED

1. Hold press the **SET** key for more than 3 seconds, while the max. or min temperature is displayed.
2. To confirm the operation, the "**rSt**" message starts blinking and the normal temperature will be displayed.

MAIN FUNCTIONS

HOW TO VIEW THE SETPOINT

1. Push and immediately release the **SET** key: the display will show the Set point value.
2. Push and immediately release the **SET** key or wait for 5 seconds to display the probe value again.

HOW TO CHANGE THE SETPOINT

1. Push the SET key for more than 2 seconds to change the Set point value.
2. The value of the set point will be displayed and the "°C" or "°F" LED starts blinking.
3. To change the Set value push the **(UP)** or **(DOWN)** arrows within 10s.
4. To memorize the new set point value push the **SET** key again or wait 10s.

HOW TO START A MANUAL DEFROST

1. Push the **(DEFROST)** key for more than 2 seconds and a manual defrost will start.

HOW TO CHANGE A PARAMETER VALUE

To change the parameter's value, operate as follows:

1. Enter the Programming mode by pressing the Set + **(DOWN)** keys for 3s (the "**C**" or "**F**" LED starts blinking).
2. Select the required parameter. Press the **SET** key to display its value
3. Use **(UP)** or **(DOWN)** arrows to change its value.
4. Press **SET** to store the new value. Once **SET** is pressed the display will move to the next parameter.
5. To exit, press **SET** + **(UP)**, or wait 15 seconds without pressing a key.

NOTE: The set value is stored even when the procedure is automatically exited by time-out.

LOCKING / UNLOCKING KEYBOARD

1. To lock the keyboard, hold down both the **(UP)** or **(DOWN)** arrows for more than 3 seconds.
2. The "**POF**" message will be displayed, and the keyboard will be locked.

NOTE: At this point it will be possible only to see the set point or the MAX or MIN temperature stored.

3. If a key is pressed more than 3s the "POF" message will be displayed.
4. To unlock the keyboard, hold down both the **(UP)** or **(DOWN)** until the "**Pon"** is displayed.

TEMPERATURE CONTROL

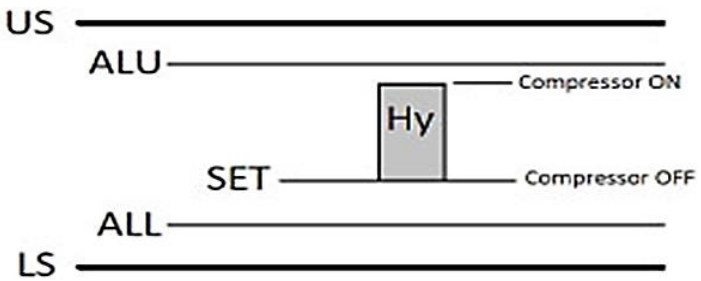


EACH LED FUNCTION IS DESCRIBED IN THE FOLLOWING TABLE

LED	MODE	FUNCTION
	ON	Compressor enabled
	Flashing	Anti-short cycle delay enabled
	ON	Defrost enabled
	Flashing	Drip time in progress
	ON	Fans enabled
	Flashing	Fans delay after defrost in progress.
	ON	An alarm is occurring
	ON	Continuous cycle is running
	ON	Energy saving enabled
°C/°F	ON	Measurement unit
°C/°F	Flashing	Programming phase

ALARM SIGNALS / OTHER MESSAGES

MESSAGE	CAUSE
P1	Probe failure
HA	Maximum temperature alarm
LA	Minimum temperature alarm
Pon	Keyboard unlocked
PoF	Keyboard locked



CONTROL CALIBRATION PROCEDURE

DIXELL SENSOR CALIBRATION

Calibration is a simple and quick process which does not require any refrigeration experience. Any in-house personnel with basic knowledge of the electronic controller is able to perform the re-calibration. Please follow the below procedure for assistance in completing the calibration process.

- To accomplish calibration, you will need a calibrated thermometer of your own.
- Place an additional thermometer as close as possible to the air probe in the cabinet.
- Let the unit run for about 30-60 minutes with the lid closed.

1. While waiting for 30-60 minutes, verify the set point of the cabinet by pressing the **SET** key once. When you do this, the controller will display the running temperature that has been selected.

If you decide to change the setpoint temperature, hold the **SET** key down until the °C symbol begins flashing. Once flashing, let go of the **SET** key and use the **(UP)** ⌃ or **(DOWN)** ⌄ arrows to modify the setpoint to your desired temperature.

2. Press the **SET** key once to save your change and the entire display will flash confirming your change. Nothing more is required, and the display will return to showing internal temperature condition summarily. If the set point is changed, however, the unit will have to run for a period to stabilize.

3. To begin calibration procedure:
   - Check the set point by pressing **SET** key.
   - Confirm the temperature showing on the thermometer you placed near the inside the cabinet is within an acceptable range* of the temperature showing on the control.
     *Note; your company will be responsible for defining what is an “acceptable range”.

***** IF THERE IS NO DIFFERNCE IN TEMPERATURE, DO NOT PROCEED FURTHER *****

4. If there is a significant difference between your thermometer and the control, follow the below instructions below to re-calibrate your equipment to the correct temperature:

   - Press and hold both the **(DOWN)** ⌄ arrow and **SET** keys until **Hy** appears.
   - Release the keys.
   - Press and release the **(UP)** ⌃ arrow until you get to setting **Ot**.
   - Press the **SET** key to access the **Ot** setting (temperature control sensor calibration).
     Input the difference between your thermometer and the set point temperature into this screen.
     Press and release the **(UP)** ⌃ or **(DOWN)** ⌄ arrows to adjust the value to the desired value.
     - If the unit is too warm inside, put a positive number in **Ot**.
     - If the unit is too cold inside, put a negative number in **Ot**

   - Press and release the **SET** key to save your changes.
     The entire display will flash confirming your change.

     The calibration procedure is now complete.
     This correction will make the unit run at the desired set point.

FREQUENTLY ASKED QUESITONS

COMMON QUESTIONS

Q: When should I defrost my unit?

A: Units should be defrosted when ice accumulation reaches approximately 1/2 inch thick. Ice acts like an insulator and the unit must work harder to reach the same temperature.

Q: Is this unit self-defrosting?

A: No, this unit is a manual defrost unit.

Q: Should I leave my freezer operating when I am not using it?

A: This unit is designed to operate continuously. Leaving the refrigeration system in operation, (even if not in use) may extend the life of the freezer and reduce the chance of refrigeration issues that may occur if the freezer is not in operation for long periods of time.

Q: What ambient conditions is this unit designed for?

A: This unit is designed for:

- Indoor use
- Altitude up to 2000m.
- Temperatures 15°C to 32°C (60°F TO 85°F)
- Recommended humidity range of 30% to 90%.

Q: What electrical conditions is this unit designed for?

A: This unit is designed for:

- Main supply fluctuations up to -5% to +10% of the nominal voltage. Consult the serial tag for nominal voltage.
- Transient overvoltage typically present on the mains supply (overvoltage category II). Pollution degree 1.

Q: Does my unit require a dedicated electrical line?

A: Yes, this unit requires a dedicated electrical line.
Please consult the labels on your unit for specific electrical requirements.

Q: Will the freezer start up after a power outage?

A: Yes, the freezer will automatically re-start when power is restored (Unless the breaker on the freezer was tripped. Open the side panel and reset breaker if needed)

Q: Does my unit have a battery back up?

A: No, if your unit has a Dixell control it does NOT have a battery backup system. (he control, alarms and refrigeration system will not operate during an interruption of power to the unit.)

TECHNICAL ASSISTANCE

IN CASE OF REQUEST FOR REPAIR

If failure occurs, stop operation of unit, and unplug the power plug.



WARNING

IF FAILURE OCCURS AND UNIT IS STILL UNDER WARRANTY, DO NOT ATTEMPT TO MAKE ANY REPAIR MODIFICATIONS TO THE UNIT BEFORE CONTACTING THE SO-LOW SERVICE DEPARTMENT, AS THIS MAY RESULT IN WARRANTY BEING VOIDED.

< CHECK FOLLOWING ITEMS BEFORE CALLING OR EMAILING >

◆ Model Number of Product

_____

◆ Serial Number of Product

_____

◆ Issue (as detailed as possible)

_____

_____

_____

_____

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10310 Spartan Drive
Cincinnati, OH 45215-1221
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For technical support:
Email: service@so-low.com

MAINTENANCE CHECKLIST

◆ MODEL NUMBER OF PRODUCT _____

◆ SERIAL NUMBER OF PRODUCT _____

Checked that freezer is operating at the correct setpoint temperature. ☐

Confirmed ambient room temperature is within range acceptable ranges. ☐
Recommended room temperature range is 15°C to 26°C (60°F TO 80°F)

◆ **AMBIENT ROOM TEMPERATURE IS:** _____°

Checked operation of alarm system on unit. ☐
Note: Alarm can be simulated by temporarily raising setpoint out of range.

Checked temperature recorders for proper operation (If applicable). ☐
Note: If there are any deviations observed, further diagnosing may be required.

ITEMS BELOW MUST BE CHECKED BY YOUR IN-HOUSE TECHNICAL PROFESSIONAL
USE CAUTION WHEN WORKING AROUND ELECTRICAL CIRCUITS

Checked AMP draw of unit when compressors stabilize. ☐

Checked incoming voltage and voltage drop when compressors start up. ☐

◆ NOTES

_____

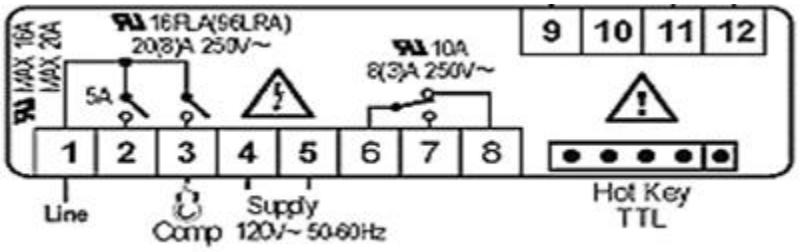
_____

◆ COMPLETED BY _____

◆ COMPLETED DATE _____

DIAGRAMS

NOTE: DIAGRAM ONLY APPLIES TO STANDARD CONFIGURATION (115 VOLTS), AND MAY NOT NECESSAIRLY APPLY TO YOUR SPECIFIC UNIT. CONSULT A CERTIFIED REFRIGERATION EXPERT.



LINE 1 - BLACK (LINE VOLTAGE)

LINE 2- <u>NOT USED</u>

LINE 3- RED- COMPRESSOR

LINE 4- WHITE- COMMON

LINE 5- BLACK POWER (LINE VOLTAGE)

LINE 6- WHITE ALARM RELAY

LINE 7- RED ALARM RELAY

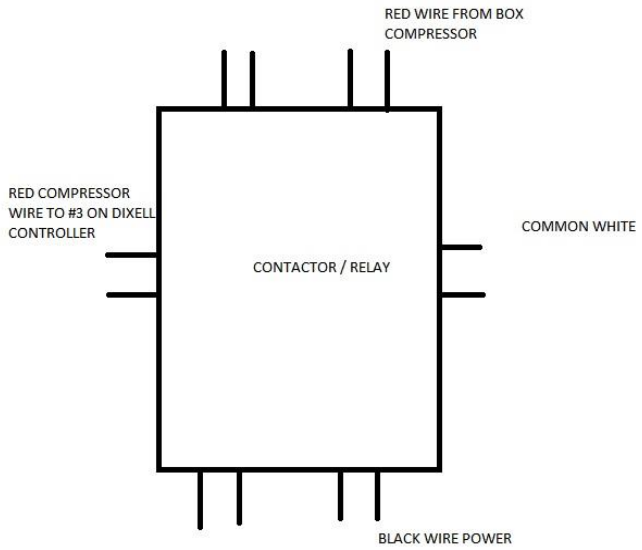
LINE 8- BLUE ALARM RELAY

LINE 9- <u>NOT USED</u>

LINE 10- <u>NOT USED</u>

LINE 11- AIR TEMPERATURE PROBE

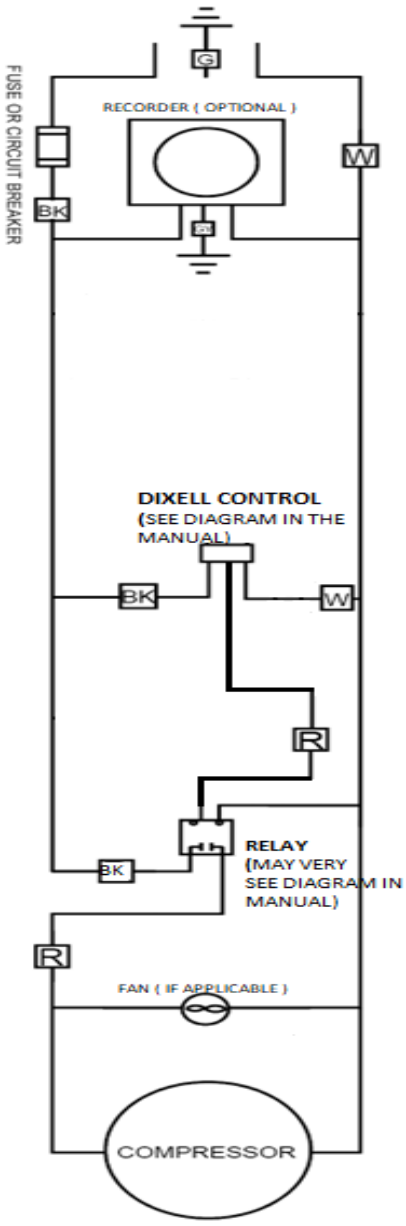
LINE 12- AIR TEMPERATURE PROBE



TEMPERATURE TO RESISTANCE CHART NTC THERMISTOR

Temp C	Temp F	Resistance Ohms
- 50	- 58	329.5
- 45	- 50	247.7
- 40	- 40	188.5
- 35	- 31	144.1
- 30	- 22	111.3
- 25	- 12.5	86.43
- 20	- 4	67.77
- 15	5	53.41
- 10	14	42.47
- 5	23	33.9
0	32	27.28
5	41	22.05
10	50	17.96
15	59	14.69
20	68	12.09
25	77	10.00
30	86	8.313
35	95	6.94
40	104	5.827
45	13	4.911
50	122	4.160
55	131	3.536
60	140	3.020
65	149	2.588
70	158	2.228
75	167	1.924
80	176	1.668
85	185	1.451
90	194	1.266
95	203	1.108
100	212	0.9731
105	221	0.8572
110	230	0.7576
All Resistance is k or (x1000)		

DIAGRAMS



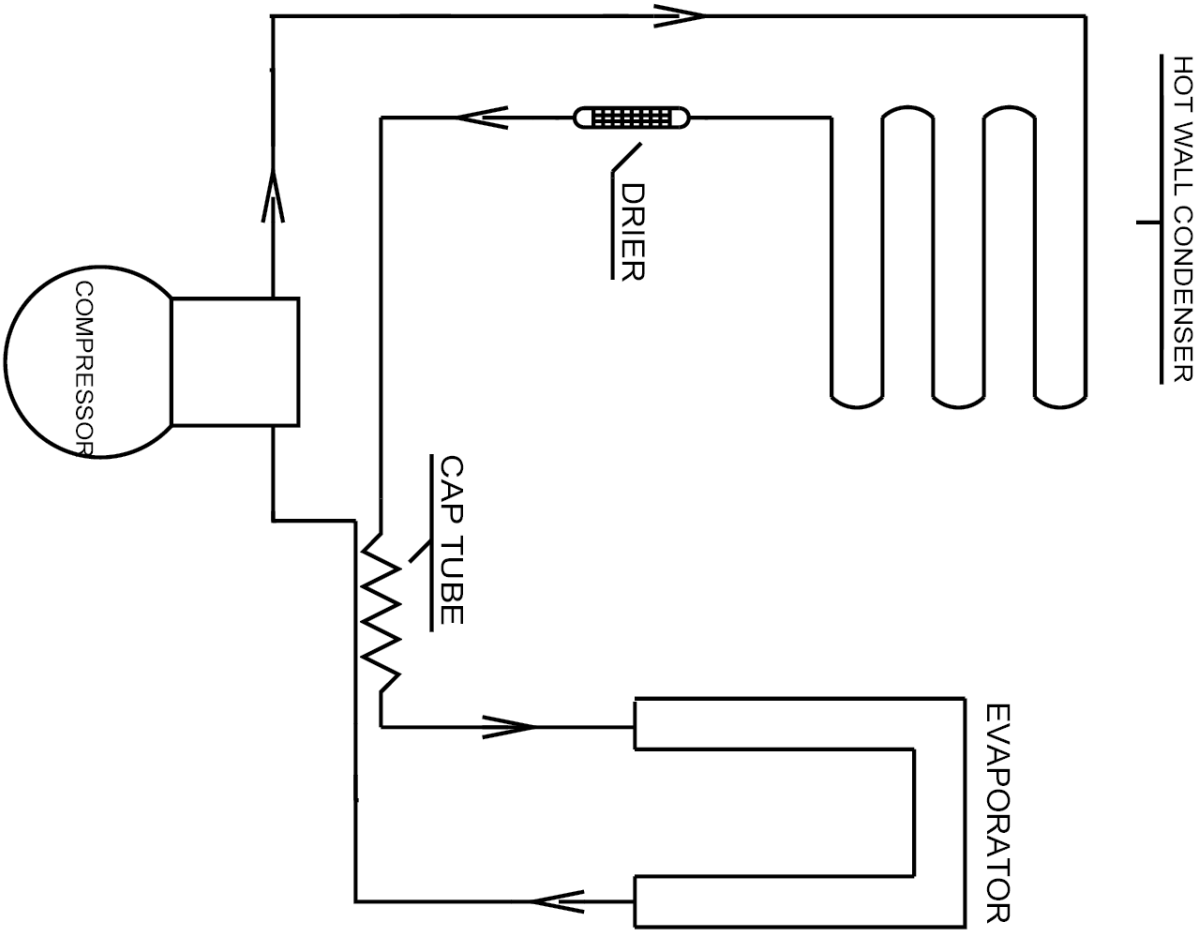
DIXELL CH 115VOLT

COLOR CODE CHART
RED = R
GREEN = G
WHITE = W
BLACK = BK

9-2022

DIAGRAMS

NOTE: DIAGRAM ONLY APPLIES TO STANDARD CONFIGURATION (115 VOLTS), AND MAY NOT NECESSAIRLY APPLY TO YOUR SPECIFIC UNIT. CONSULT A CERTIFIED REFRIGERATION EXPERT.



REFRIG. FLOW CHART

WWSS

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