

DOMETIC Refrigerators

- Americana
 - RM1350
- RM3762 & RM3962
- DMR702
- 8-Series

Americana & Americana Plus



Americana
(No Temp Adjustment on
eyebrow board)



Americana Plus
(Temp Adjustment built
onto upper eyebrow
controls)

- DM2652
- DM2662
- DM2852
- DM2862
- DM2663
- RM2351
- RM2354
- RM2451
- RM2454
- RM2551
- RM2554



- Use Hercules, ZhenBang, and Universal boards
- Interchangeable upper boards from no temp adj to Plus



Americana II

Eyebrow controls relocated behind freezer door.



- DM2672
- DM2682
- DM2872
- DM2882



- LED Interior Light
- Residential Design
- Redesigned Shelves
- Optional Ice Maker

Redesigned door handles.



RM1350 Side-by-Side

RM1350XXXX

- Installation Depth 26"
- Foam Panels
- 2 Fans

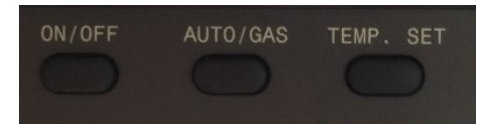
RM1350SLM

- Reduced install depth by 2" to 24" (Easy replacement for Norcold 4 Doors)
- Vacuum Panels
- 4 fans

NOTE: These model have an automatic frost reduction feature. It is a timed cycle. 60 hours after the fridge is connected to 12VDC, the cooling unit will shut off for 2 hours. This cycle then repeats every 48 hours.



Digital Display at the upper right hand corner of the unit will display modes of operation and average Fresh Food air temperature



Controls for unit are at the top of the Freezer Compartment behind the Right Hand Door

The bottom flapper guide was removed as a design change in December 2018.

New Generations 3762 & 3962

RM3762

- 7 cubic ft.
- 53 ¾ x 23 11/16 x 24
(recess dimensions)
- Direct replacement for
DM2652 and DM2662

RM3962

- 9 cubic ft.
- 62 63/64 x 23 11/16 x 24
(recess dimensions)
- Digital read out
- Optional icemaker
- Auto climate control
- Auto low ambient control



DMR702 Renaissance

- 7 cubic ft.
- Direct replacement for RM2652 and RM2662
- 53 ¾ x 23 11/16 x 24 (recess dimensions)
- DMR702XB: Use Hydra Board
- DMR702XB-D: Use Hydra
- DMR702XB-C: Use Zhang Bang
- DMR702XB-E: Use Zhang Bang
- Upper controls between freezer and fresh food

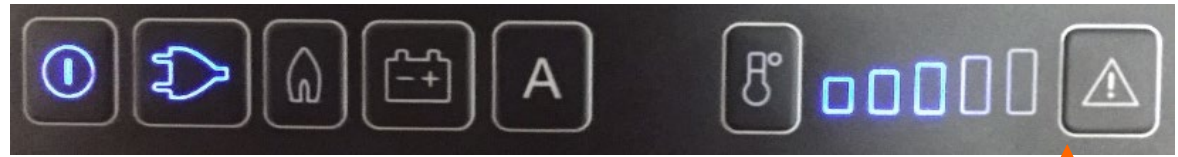


White Light
Replacement:

4450010552

8-Series

- 3.7 or 4.3 Cu. Ft.
- Manual and Automatic energy selections available
- Removable Freeze Compartment



Upper Control Panel



Interior
Lighting/
Locking
Mechanism





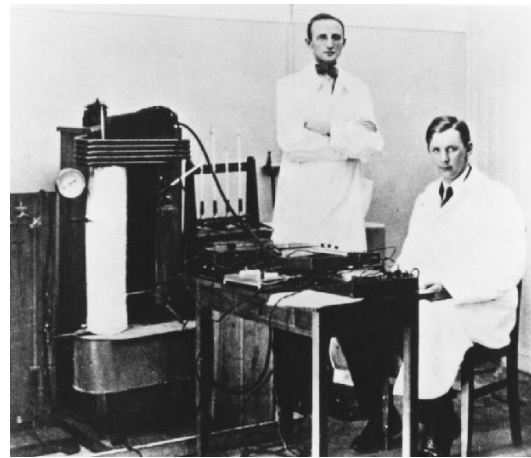
Absorption System & Proper Installation

Mobile living made easy.

 **DOMETIC**

Compressor vs. Absorption Refrigerators

- Compressor units will create more noise than silent absorption systems
- Controlled environment vs. changing environment
- Initial cool down period is longer on absorption than compressor
 - Absorption units should pre-cool for 24-48 hours before use
- Recovery time is vastly different
 - 30-45 minutes for a compressor refrigerator
 - 1-2 hours for an absorption refrigerator
- Ventilation requirements differ
 - Compressor units can run without the need to vent outside
 - Absorption systems will need to have upper and lower outside vents
- Power/operating sources differ
 - Absorption offers the possibility to operate off of 120V, 12V, or Gas
 - Compressor units will mostly operate on 120V with some 12V options
- Standards are different - FDA vs. ANSI



Absorption cooling technology has been around since the mid 1800s.



The Absorption System

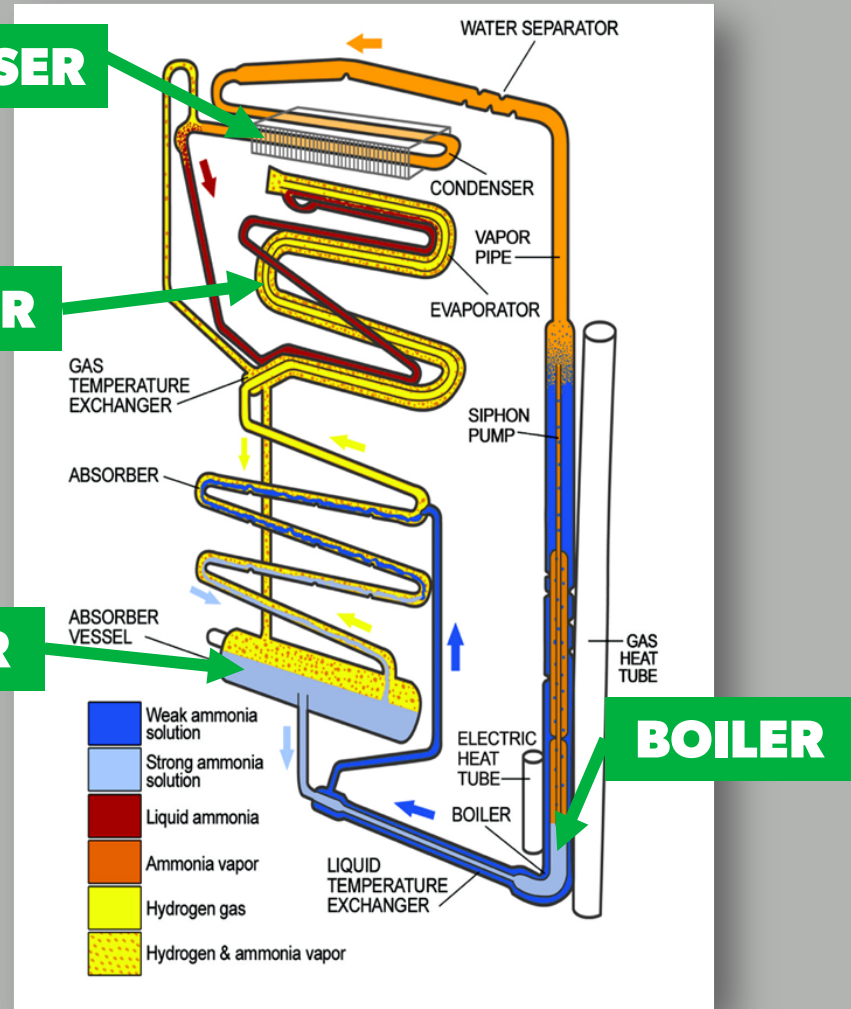
Solution is made up of a unique formula including

- Ammonia
- Water
- Hydrogen
- Rust Inhibitor
 - Sodium Chromate

CONDENSER

EVAPORATOR

ABSORBER



BOILER

Cooling Unit Sequence:

Other than the mixture moving from gas to liquid, the cooling unit has no moving parts and is a silent system.

Mixture starts
condensing back
into liquid

Cold!

Slightly
Warm

Gravity feed back
down to Absorber
to repeat process

Mixture is a gas at this point

Pretty
Warm

Pretty
Hot

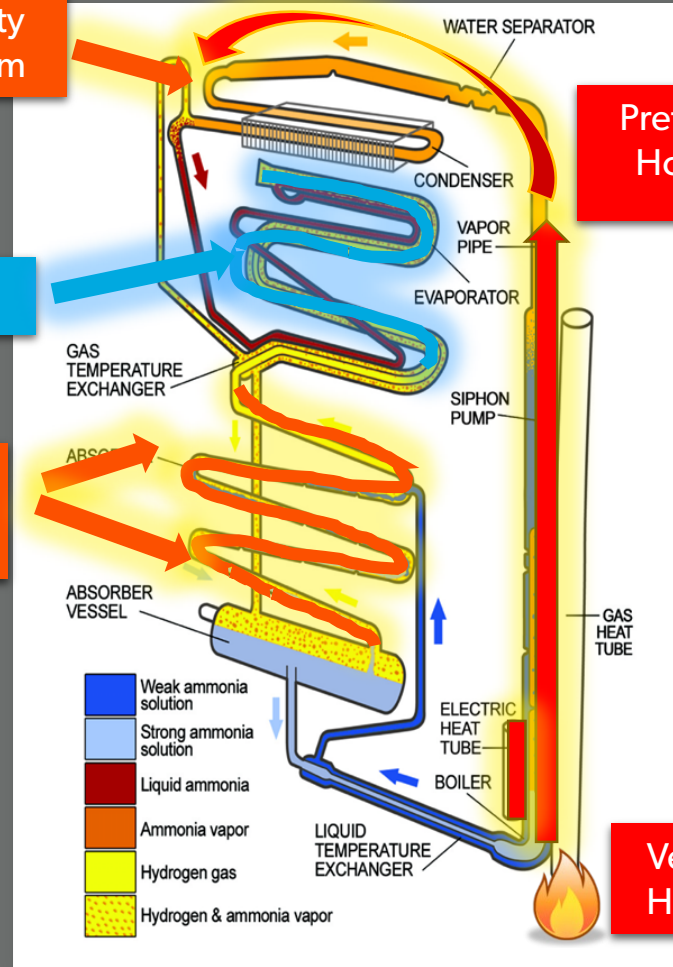
Heat Rise
-Mixture begins
to boil into gas

Very
Hot!

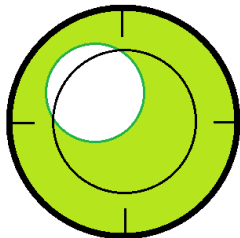
Heat is
applied via
Gas or Electric
Element

Three Criteria have to be met:

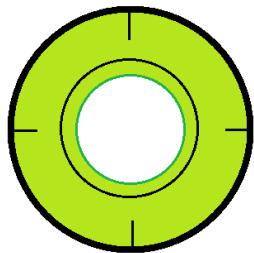
- Unit Must Be Level
- Proper Ventilation
- Heat Source (Gas/Electric)



Verify the Refrigerator is Level



Use a bubble level in the freezer and level the RV to the fridge.



Leveling the fridge as much as possible will maximize cooling and prolong the life of the unit.



Running the unit out of level for too long is one way blockages form in the cooling unit.



Does the unit have to be level during travel?

It is not critical to level the refrigerator while the vehicle is moving. The rolling and pitching movement of the RV helps keep the refrigerator operating efficiently.

Ventilation

Proper Venting, Airflow & Clearances

The number one reason a fridge will struggle to cool or hold temp **AND** the most overlooked issue when troubleshooting an absorption fridge is improper venting (installation).

Understanding the requirements for proper venting and clearances will help you diagnose improper fridge cooling situations much faster.

If an absorption fridge has symptoms of chasing outside temps, such as, the interior fridge temp is below specifications in the heat of the day but performs better at night or in a cooler environment, improper venting is the most likely cause.

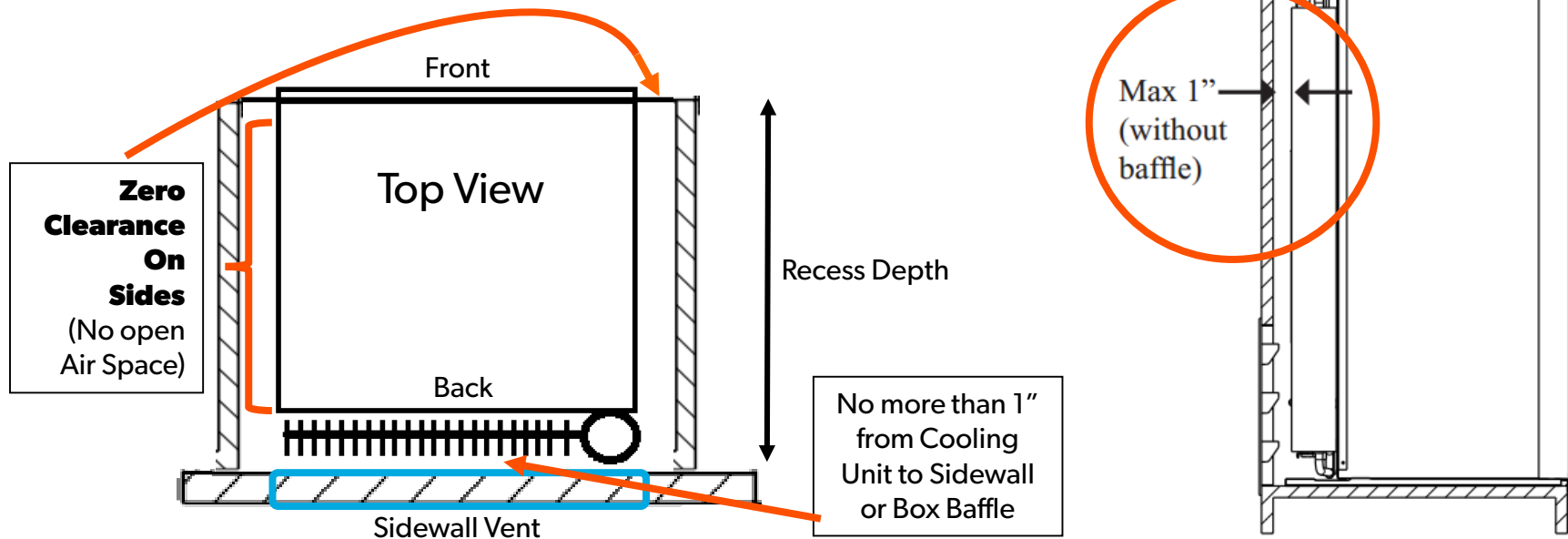
If you find the fridge to have a decent gap from fresh food temps to freezer temps, for example, 25F in the freezer and 55F in the fresh food compartment, this is likely a venting issue as well.

The next several slides will extensively go over venting requirements. If any of these are not met to specifications, the fridge will not cool properly.

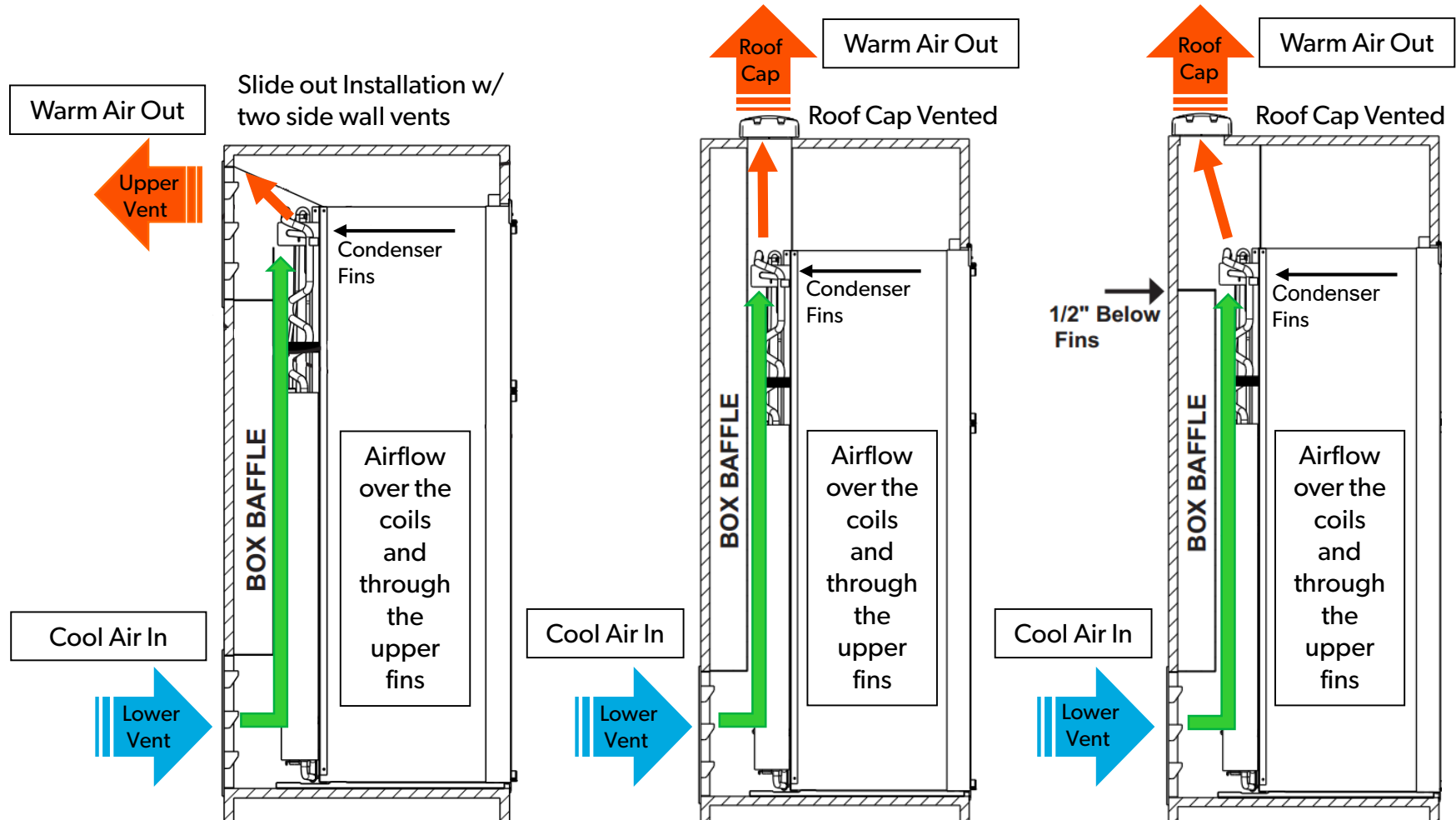
Ventilation

Make sure that you check ventilation and air flow

- 0" clearance on the sides and top. Any open air space on the top, left, or right side of the unit should be filled with insulation.
- No more than 1" from the back of the cooling unit to the sidewall. (A box baffle may need to be installed to help direct air through the coils).
- If there is an auxiliary fan, check that it is working properly and installed in the correct position.

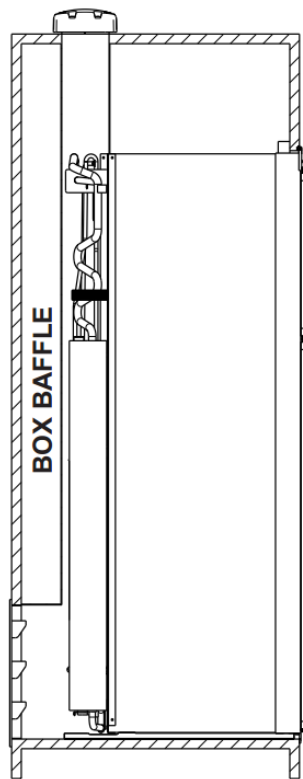


Airflow over the Condenser Fins is **Critical!**

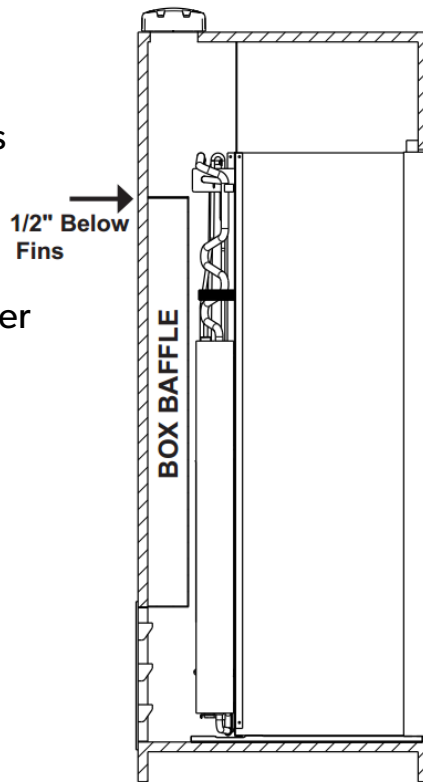


Installation with Roof Cap

When a Box Baffle is needed to keep the space between the cooling unit and the sidewall 1" or less, the box should start at the top of the Lower Sidewall vent and lead up and past the upper Condenser Fins.

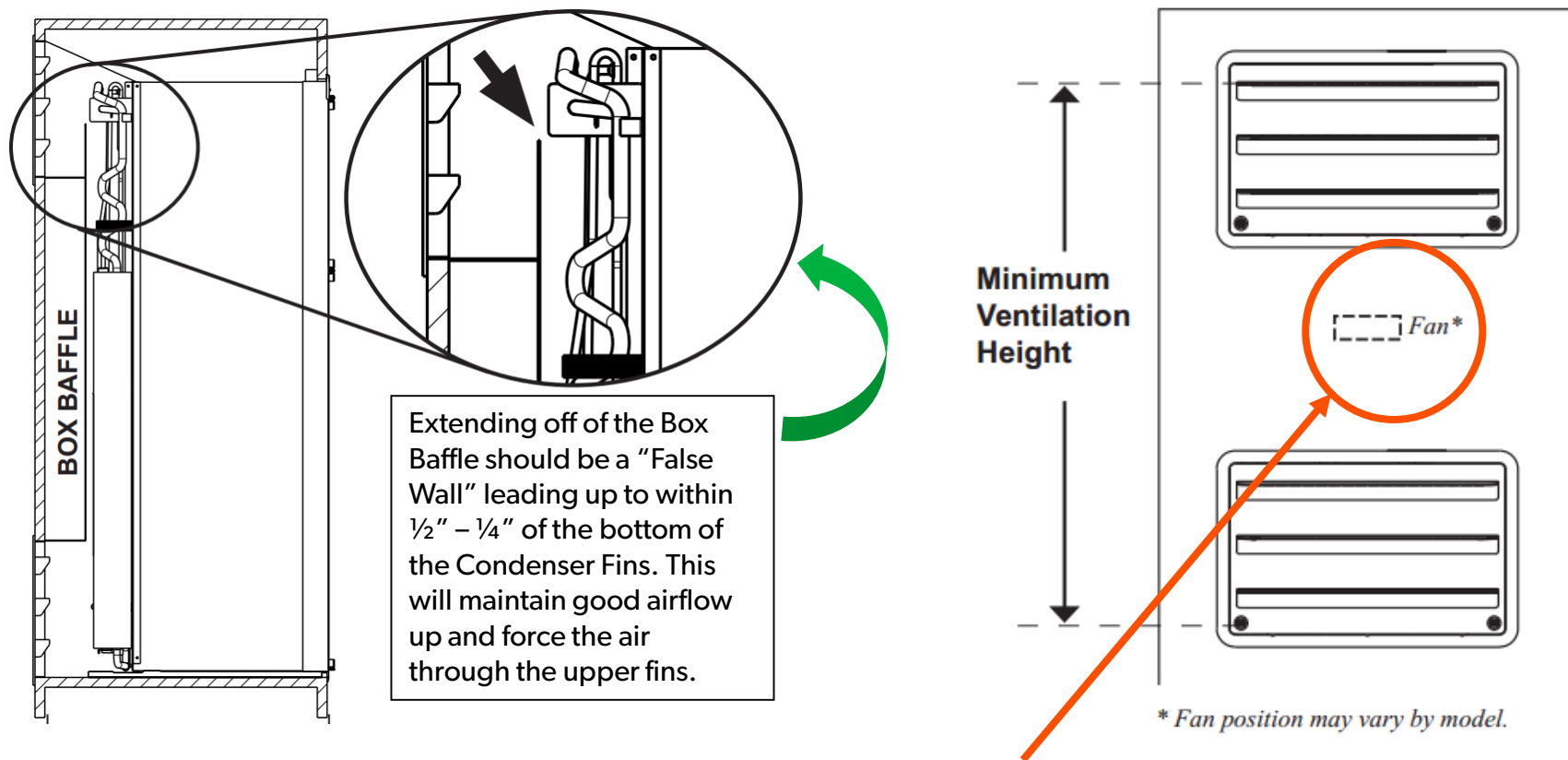


The Box Baffle can also be installed as such that it would lead up to within $\frac{1}{2}$ " – $\frac{1}{4}$ " of the bottom of the upper Condenser Fins.



These types of installations maintain airflow and force air up and through the Condenser. Too much open air space between the Cooling Unit and the Sidewall would allow warm air to collect and become stagnant.

Slide Out Installation with Two Sidewall Vents



All installations with two sidewall vents must have at least one ventilator fan. Two fans for the RM1350 (Can be up to 4 fans).

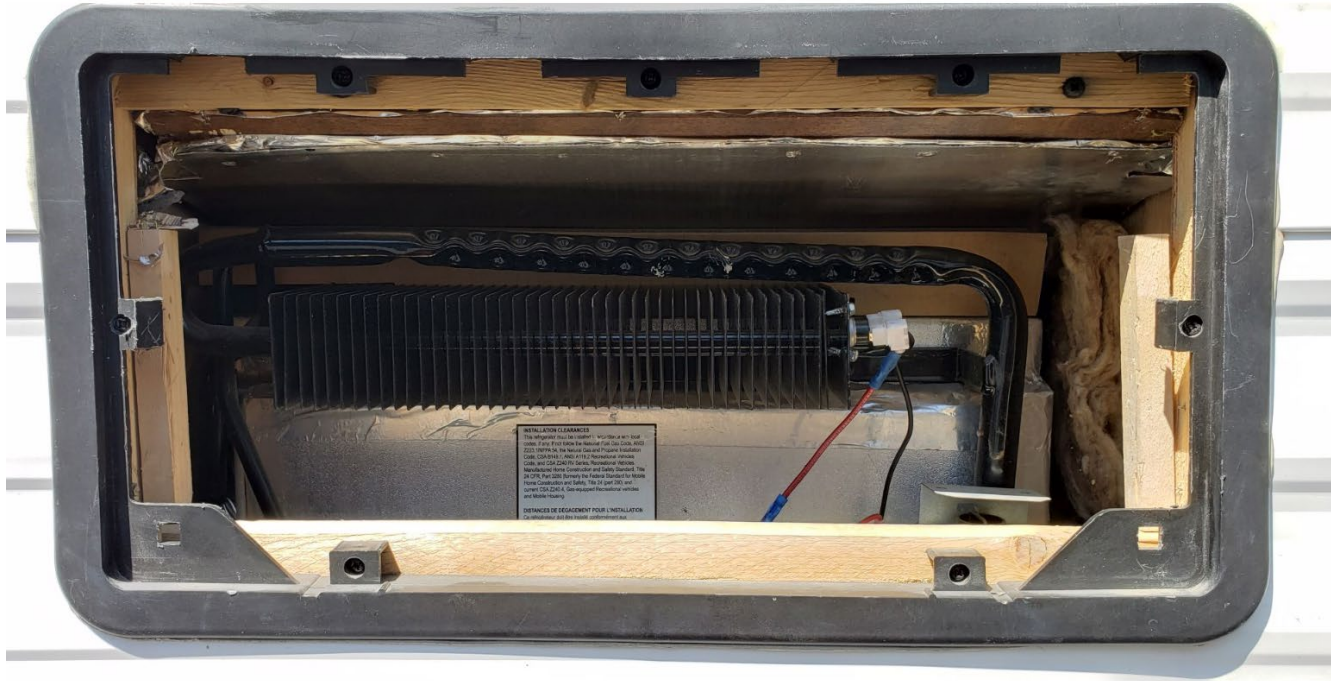
Improper Ventilation

Too much open air space on the top side of the fridge will allow warm air to collect, become stagnant, and overheat the unit.



The “false wall” baffle is also too far up in this installation. It should lead to 1/4” - 1/2” away from the bottom of the fins, not pass beyond them.

Improper Ventilation



The "false wall" baffle is too low in this installation. It should lead to 1/4" - 1/2" away from the bottom of the fins. There are too many open air gaps around the fridge, allowing warm air to collect. No deflector present above the fins to assist in turning the air out.

Improper Ventilation

Excessive Insulation

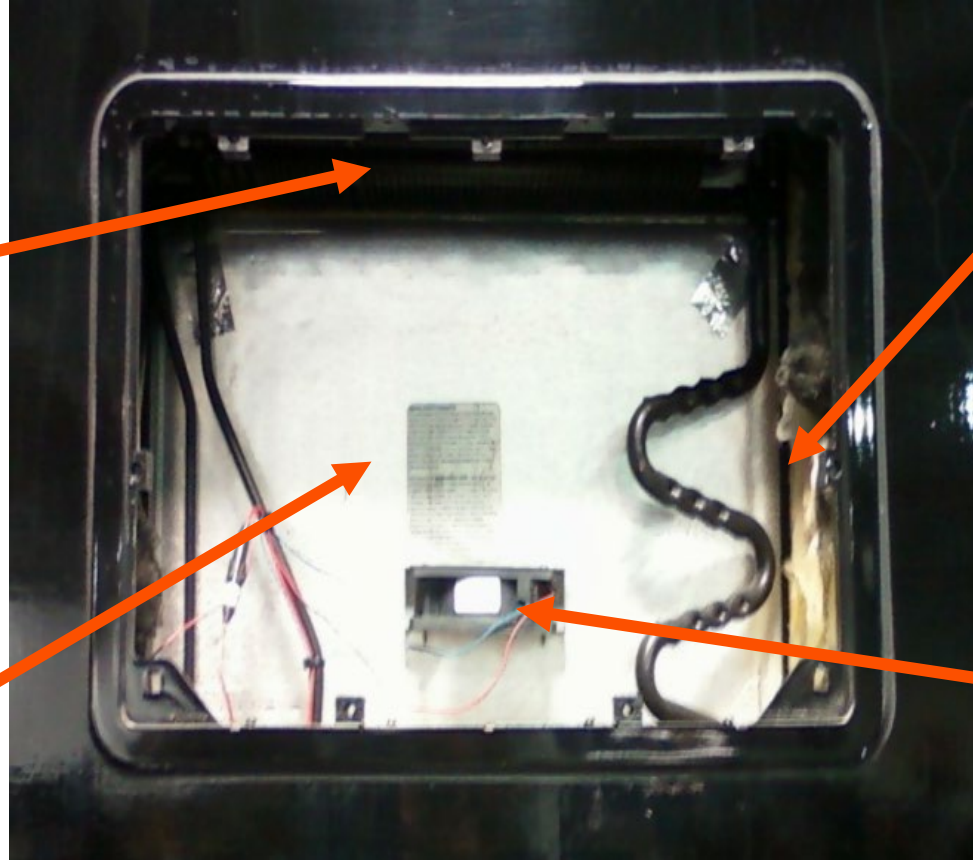


Remember: The key to airflow is that the air not only gets to the upper condenser fins but can pass through the fins and out of the upper vent.

Improper Ventilation

Condenser fins are so high up within the cutout that air cannot pass through and out of the vent. (There is a fix for this on the next slide.)

Missing "false wall" or baffle box extension leading up to within $\frac{1}{4}$ " – $\frac{1}{2}$ " of the bottom of the condenser fins.



Too much open air space on the sides allowing warm air to collect and overheat the unit.

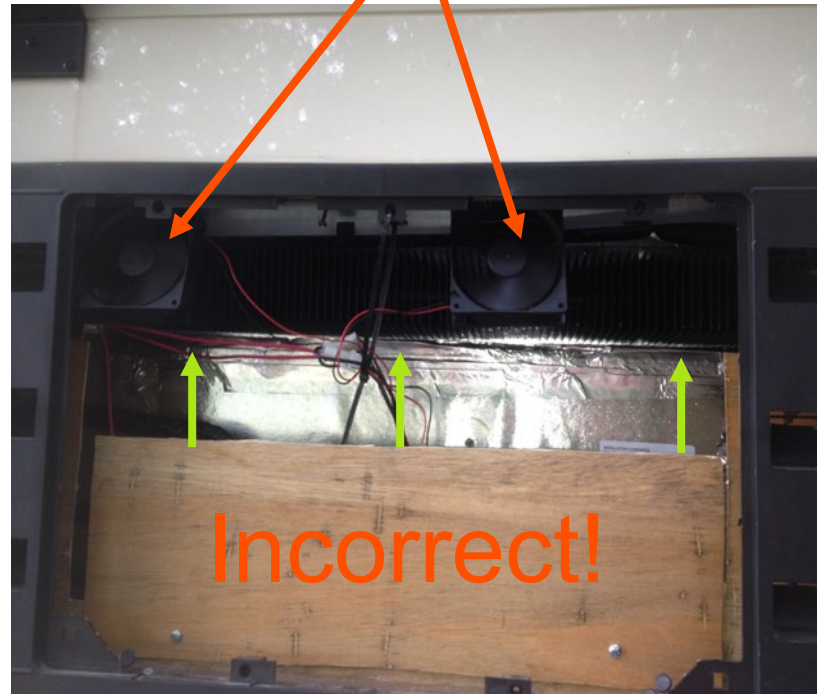
Ventilator fan is installed too high. Should be located in the middle of upper and lower vents.

The correction for the upper fins located so high up within the side wall cutout in the previous slide would be the following...



...since the air cannot pass through the condenser fins, fans should be installed at the upper vent to pull the air off of them.

Be sure the fans are blowing the right direction. They should be blowing out, pulling the air off of the fins, not blowing in.



Make sure the "False Wall" baffle is high enough, again $\frac{1}{4}$ " – $\frac{1}{2}$ " from the bottom of the condenser fins.

In the example to the left, it appears as though this fridge is installed well enough to work in mild conditions (50-70 F).



It is missing a "turning vein" though and would probably not be able to vent well enough on very warm days (80-100 F)...



...however, looking at the same fridge from a different angle, we now see there is a large gap between the top baffle wall and the fridge. This would allow warm air to collect on the top of the fridge and in turn overheat the unit since the environment is not being controlled around the top.



What's wrong with this picture?

Where are the condenser fins?
While a turning vein / deflector is required for this type of installation, remember the goal of airflow, air up to the fins to grab the heat, and expel it out.

In this case the air is getting trapped behind the deflector and the fins cannot breath.

Proper Ventilation

Baffle "False Wall" installed to within $\frac{1}{4}$ - $\frac{1}{2}$ inch of condenser fins.



"Turning Vein" installed above the condenser fins to help deflect air out.



Pre-installed Ventilator Fans

Pre-installed Fans Part Numbers

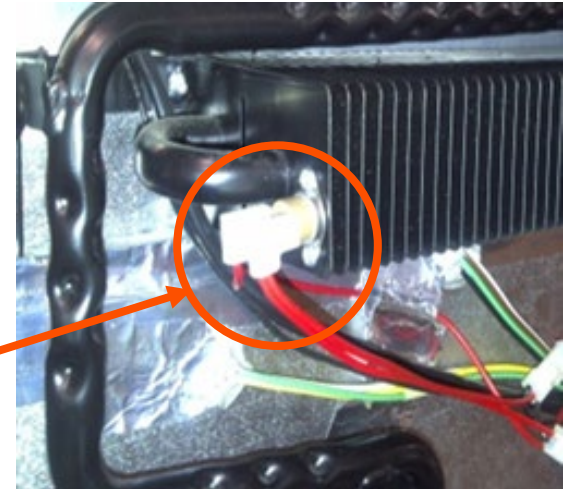
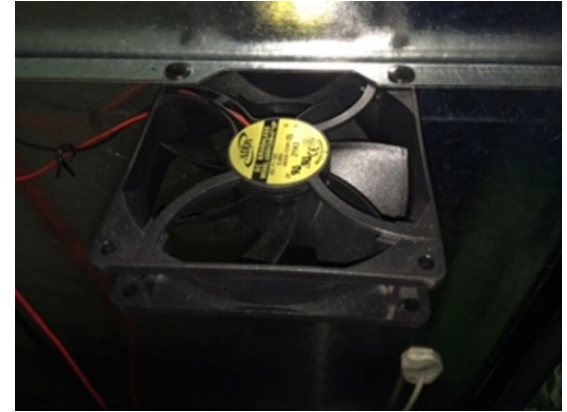
- 3" fan size
- Fan only PN: 38511830166
- 8-Series Switch PN: 2412906204

Requirements

- If the refrigerator is installed in a slide room it must have 1 fan.
- RM1350 installed in a slide room must have 2-4 fans.

Switch

These fans are controller by a switch that will open and close at specific temps.



After Market Ventilator Fans

Aftermarket Kits

- 5" fan size
- Will draw 0.5 amps each
- 3108705.751 for single door refrigerators
 - Fan switch will close at **105°F** and open at **90°F**
 - Switch only PN: 3313470.095
- 3108705.744 for double door refrigerators
 - Fan switch will close at **150°F** and open at **120°F**
 - Switch only PN: 3104133.016

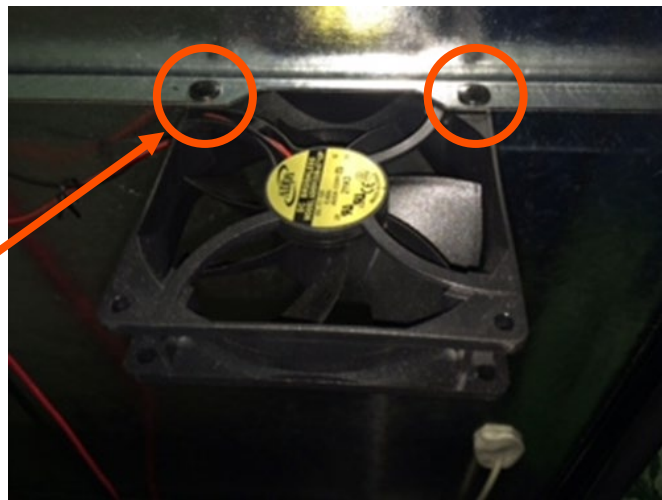


Ventilator Fans

Upon complaints of fans being too loud or noisy.

First and foremost, fans are a moving part and will always make some noise. Use your best judgment, if a fan is excessively loud, it will be one of two things, either the fan bearings have gone bad and the complete fan will need to be replaced, or the fan is vibrating against the mounting bracket.

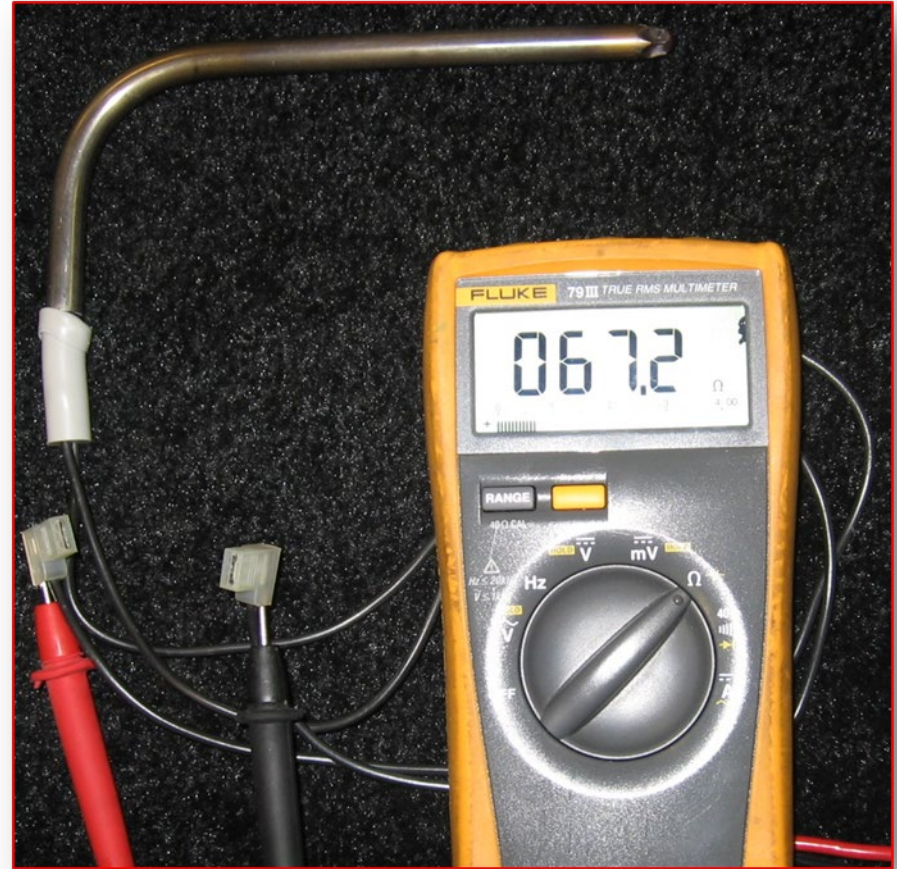
If it is a vibration issue, simply install some rubber washers/grommets between the fan casing and the mounting bracket to absorb the vibration. **NEVER** install an on/off switch for the customer. This will void the warranty.



Cooling Unit Testing

Heat Source

- During operation check the AC amp draw of the element.
- When testing the cooling unit, test on the AC side. **There are too many variables when testing on LP.**
- Measure the ohms value of the heating element at room temperature.
- Never OVER or UNDER size your heat source!
- It is okay to have wiggle room up and down – not side to side.



Heating Element



What's wrong with these pictures?

Proper Cooling Unit Testing

Before going any further in diagnosing a fridge that has a complaint of not cooling properly, use your senses... See, Smell, Hear.

See:

- If you can see a visible leak on or around the cooling unit (yellow or green residue). In this case, clean the area if only a small amount is present (Sodium Chromate will dissolve in warm water), if the residue appears again overnight there is a compromise in the sealed system and the cooling unit will need to be replaced.

Smell:

- If there is a strong smell of ammonia present there is a leak within the cooling unit and it will need to be replaced.

Hear:

- If you can hear a “gurgle” sound coming from the cooling unit, there is a pin hole leak in the sealed system and the cooling unit will need to be replaced.

If any of these issues are present, your diagnosis is done.

DO NOT perform any further testing, the cooling unit has been compromised and will need to be replaced.



Proper Cooling Unit Testing

Three Criteria have to be met:

Leveling:

- The unit must be level in order for the mixture within the cooling unit to cycle through and gravity feed down to repeat.

Heat Source:

- There must be a source of heat to boil the mixture in the cooling unit to have the proper heat transfer. We require testing to be done on the AC side, not LP.

Ventilation:

- The proper clearances and baffling must be in place in order to have good air movement over the coils, through the condenser fins, and expel out of the upper vent.

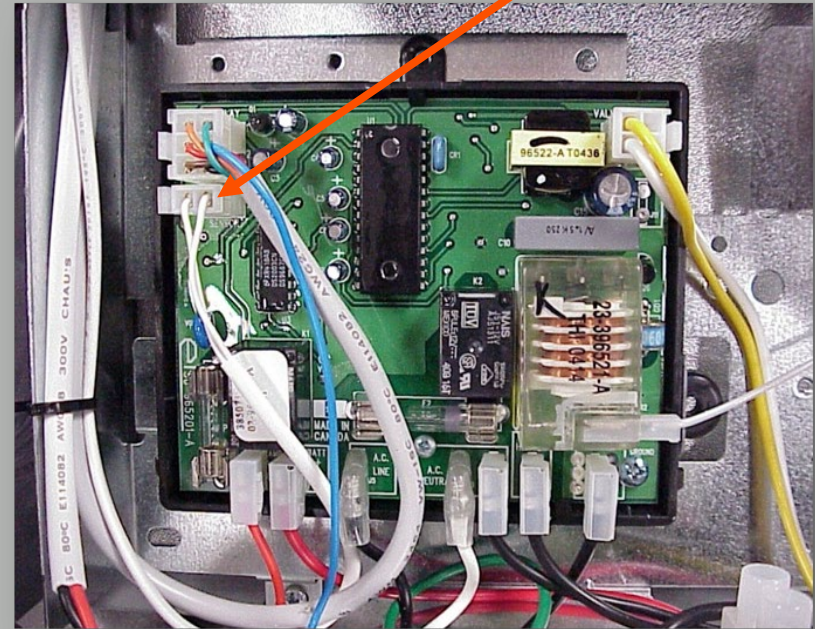
Once these three criteria have been verified and met, if there is a complaint of the fridge not cooling properly, then we can move on to the **Cooling Unit Bypass Test...**

To Perform a Bypass Test of the Cooling Unit

Americana/Americana Plus

Disconnect the thermistor from the control board at **P2** (with the thermistor unplugged no temperature is sensed, therefore, it will run continuously). This was designed intentionally so that if the thermistor fails the unit will get as cold as it possibly can since there are no error codes to display and warn the customer that the thermistor has failed.

Unplug at P2



To Perform a Bypass Test of the Cooling Unit

RM3762

RM3962

RM1350

DMR702



Secondary Thermistor Required

PN:3851059042

- RM1350 with water in the door—drain the bladder first
- Disconnect the thermistor from the control board. Connect a secondary test thermistor and let it hang out the lower sidewall vent to sense outside ambient temperature. This will trick the system to run “wide open” and never feel satisfied.



Unplug

Note: This can only be done when the outside/shop ambient temperature is 50° F or warmer.

Cooling Unit Testing Continued

- Place a glass of water in the refrigerator along with a thermometer.
- Plug unit into 115 VAC and allow to run “wide open” for a minimum of 6 hours in the AC mode.
- Record the substance temperature in the refrigerator and the freezer compartments. (DO NOT record surface or air temps as this will not give an accurate average food temp.)



Results

After 6-8 hours check the liquid substance temperature

Industry (ANSI) Standards With Thermistor Plugged In

- 8 cubic ft. and larger should be 43°F or less at 110°F ambient temperature.
- 6 cubic ft. and smaller should be 43°F or less at 90°F ambient temperature.

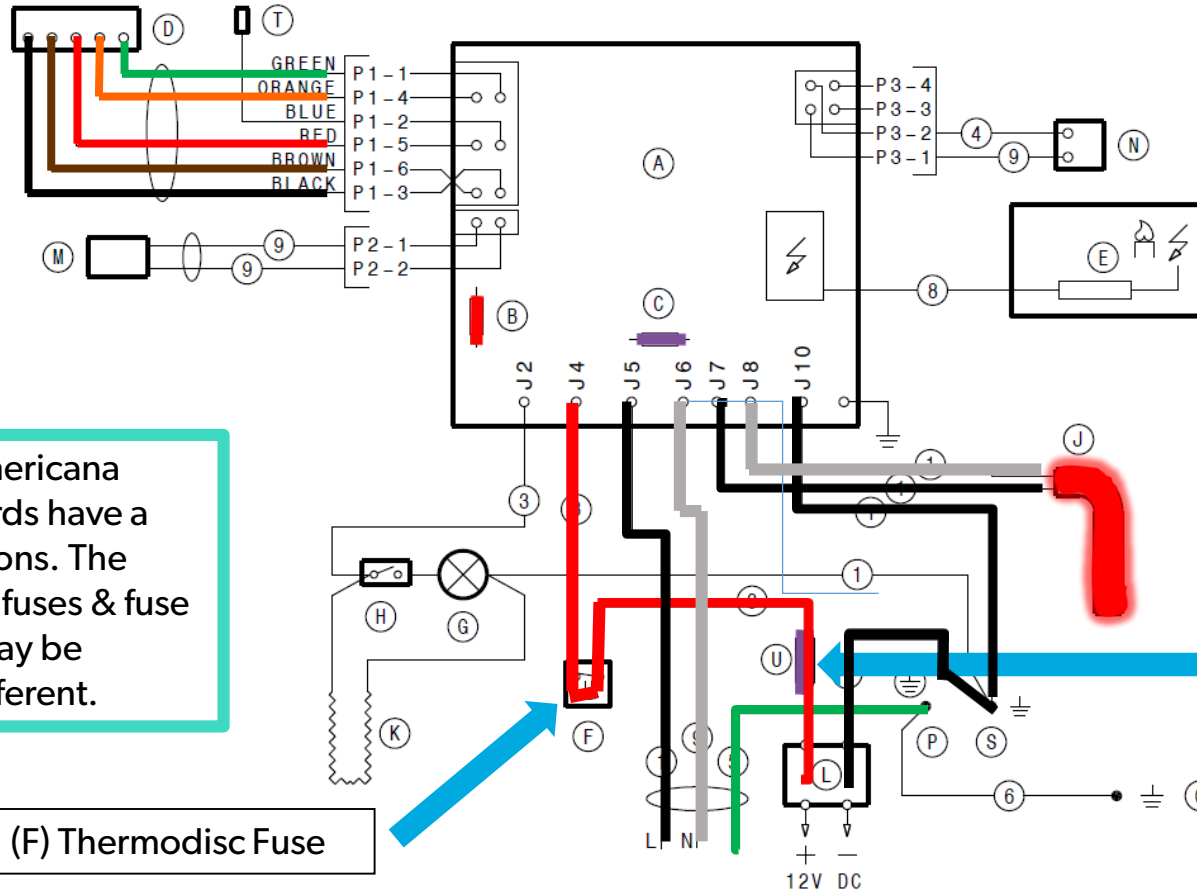
After Running 6-8 Hours “Wide Open”

- Refrigerator compartment should be approximately in the lower 30's, if there is not excessive heat and ventilation has been confirmed.
- Freezer compartment should be at 12° F or less. This is due to ice makers installed in Dometic fridge units. Ice makers will not call for ice unless it is 12° or less. ANSI requirement for the freezer is 16 ° F.



Sequence of Operation Electric vs Gas

Electric: Americana Series

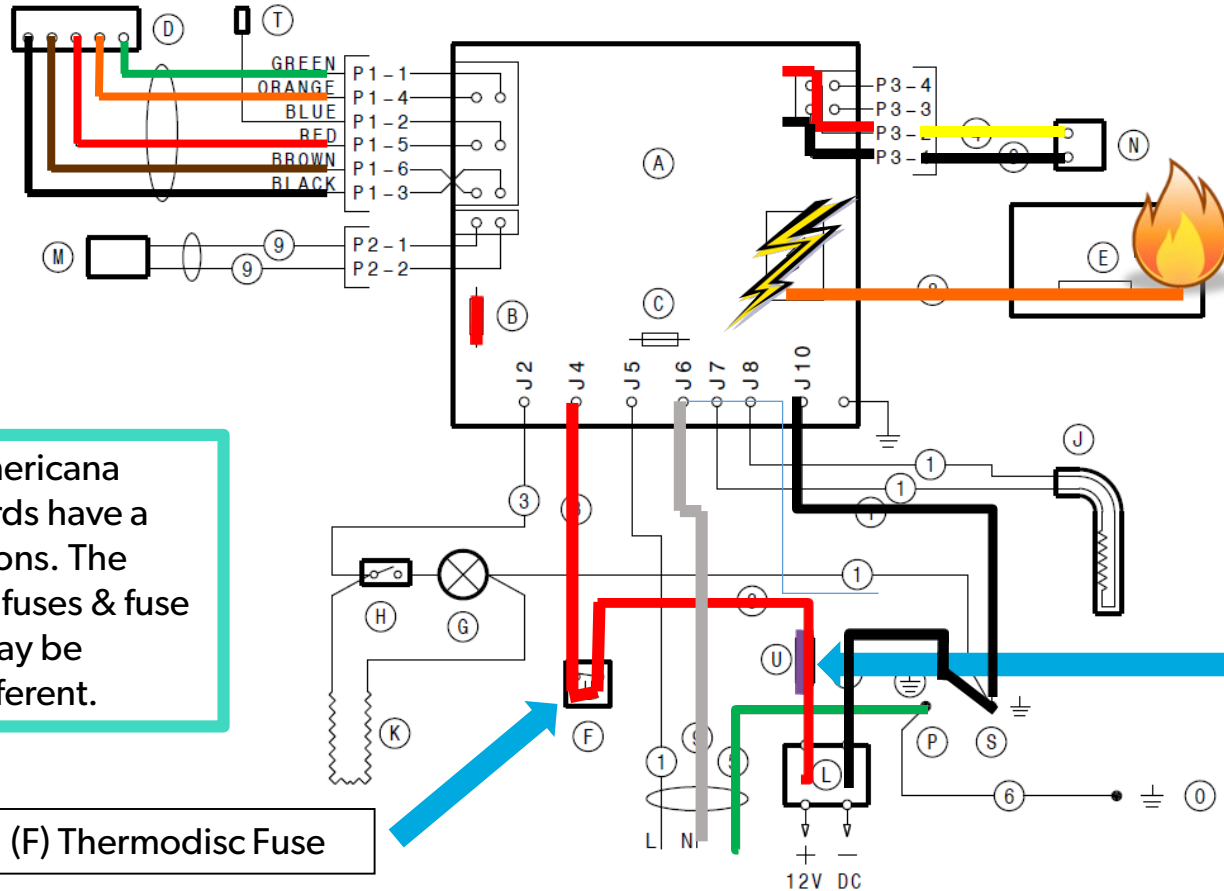


NOTE: Americana lower boards have a few variations. The number of fuses & fuse location may be slightly different.

(F) Thermodisc Fuse

(U) Thermal Melt Fuse

Gas: Americana Series



NOTE: Americana lower boards have a few variations. The number of fuses & fuse location may be slightly different.

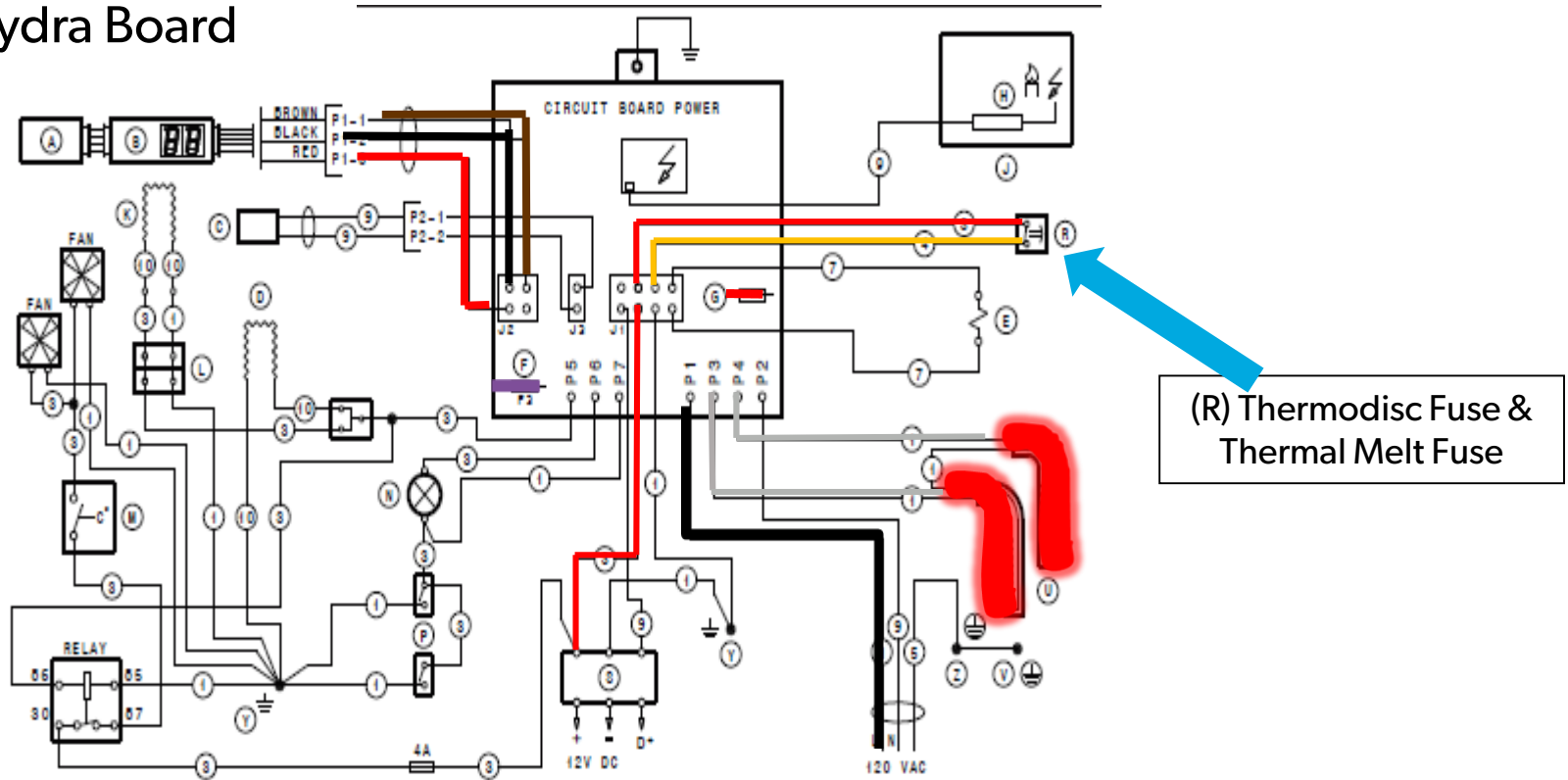
(F) Thermomelt Fuse

(U) Thermal Melt Fuse

Electric:

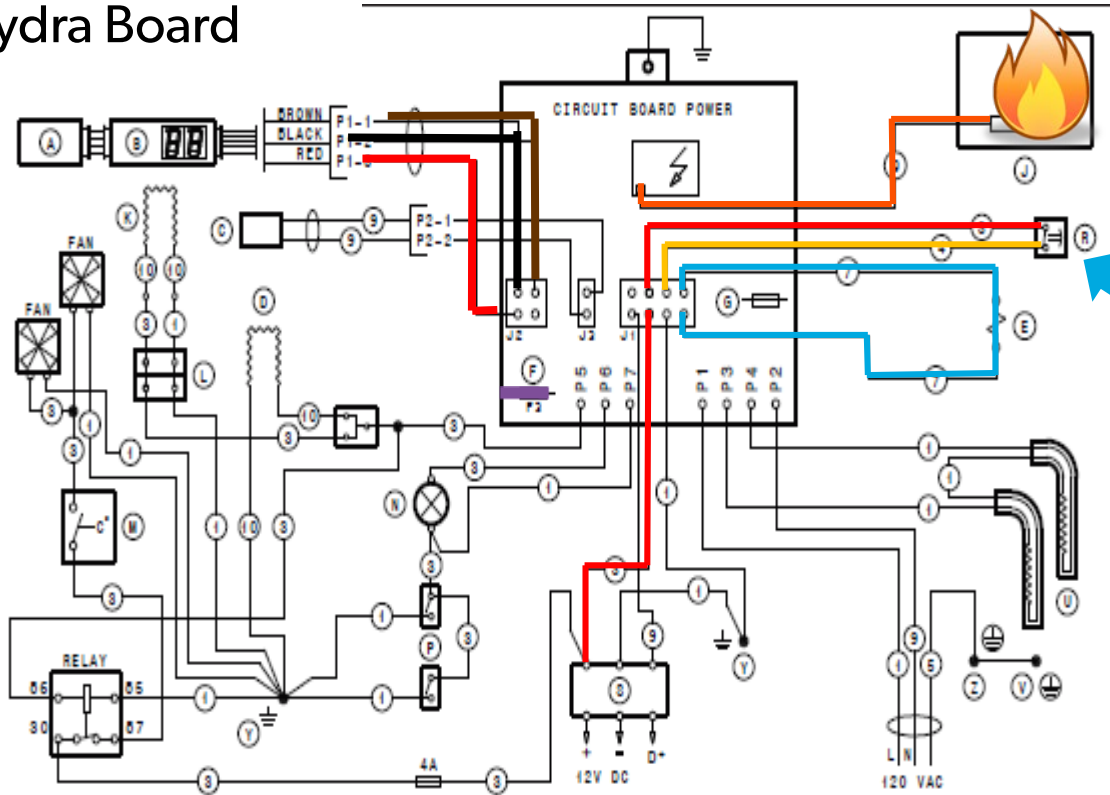
RM1350/RM3762/RM3962/DMR702

Hydra Board



Gas:

Hydra Board



(R) Thermodisc Fuse & Thermal Melt Fuse



Mutual Components

Employed for both Electric & Gas Operation

Mobile living made easy.

 **DOMETIC**

Thermodisc

Safety device interrupts operation if overheated

- Closed circuit – opens if overheated
- 12 VDC on both sides
- Resettable

Symptoms:

- No panel lights on upper display
- Fridge not operating/turning on
- E3 Error Code on New Gen/1350

Troubleshoot:

- Overheating – ventilation
- Heating element – not inserted correctly/corroding



NOTE: Only replaceable through warranty department with an RGA. Part is not purchasable for stock.

Thermalfuse

Safety device interrupts operation if overheated

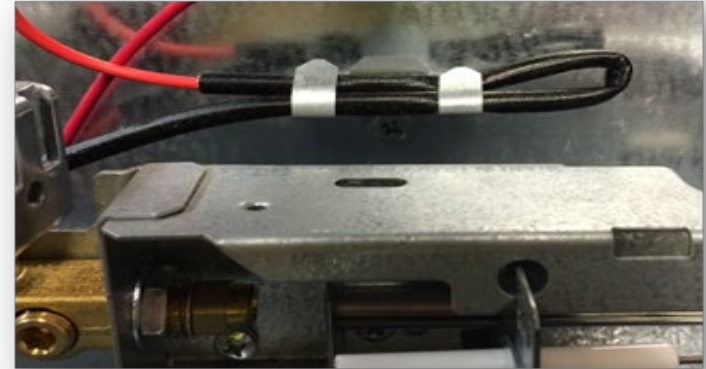
- Breaks continuity if overheated
- 12 VDC on both sides
- Non resettable

Symptoms:

- No panel lights on upper display
- Fridge not operating/turning on
- E3 Error Code on New Gen/1350

Troubleshooting:

- Check continuity on fuse



NOTE: Only replaceable through warranty department with an RGA. Part is not purchasable for stock.

Thermistor

The function of the thermistor is to monitor the temperature inside the refrigerator box using resistance

Symptom: Over cooling (low Ohms) or under cooling (high Ohms)

Check the ohms value of the thermistor. In a glass of ice water at approx. 34°F you should see between 8,500 and 9,500 ohms +/- 10%.

Check each wire to chassis ground to verify there is not a short in the wire.

Note: Older NDA 1402 model has a different value. At approx. 34°F you should see between 5,000 and 6,000 ohms +/- 10%.

Thermistor adjuster P/N 2932164011

Plugs in between the thermistor and board making it read 5° warmer, in turn, making the unit run about 5° cooler.



Thermistor Locations

Americana & Americana Plus

Far right fin, probe in the middle of the clip.

RM1350/RM3762/RM3962

Bracket on the left hand sidewall

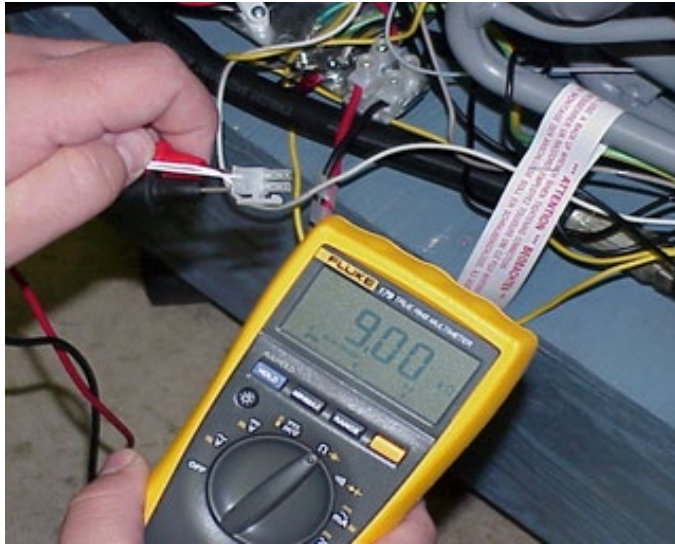
DMR702

Bracket below the second shelf on the back wall.



Thermistor Ohms Values

If you are not able to test the thermistor in a glass of ice water, you can refer to this chart for the ohms resistance you should see at specific temperatures. Remember there is always a +/- 10% tolerance when testing ohms resistance.

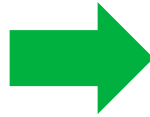
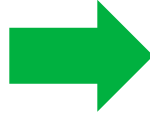


TEMP C	TEMP F	R VALUE
-2.8	27	10849
-1.1	30	9932
1.1	34	8842
3.3	38	7883
6.1	43	6845
8.3	47	6124
11.1	52	5341
13.3	56	4795
15.6	60	4311
17.8	64	3882
20.0	68	3500
22.2	72	3160
24.4	76	2857
26.7	80	2586
28.9	84	2344
31.1	88	2127
33.3	92	1933
35.6	96	1758
37.8	100	1601

Climate Control "Frame" Heater"

Prevents condensation around the frame

- Switched option on older models (up to roughly late 2008).
- Built in on all current models (since 2009).
- Heater is built into the frame.
- 0.5 amp
- 24 ohms +/- 10%



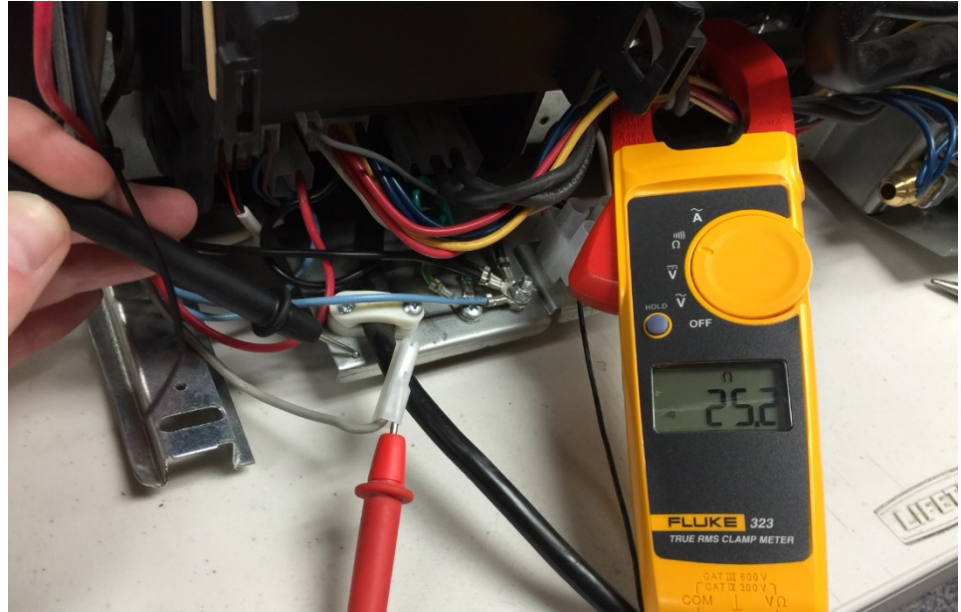
Low Ambient Temperature Control

Allows the refrigerator to cycle in cold temperatures.

- Switched option on older models
- Currently built into the RM3762, RM3962, RM1350, & Renaissance
- 0.5 amps & 24 ohms +/- 10%

Switched Models

Turning the switch on allows the interior light to turn on, creating heat on the thermistor and causing the cooling unit to cycle. Prevents frozen foods from thawing.



Low Ambient Cont.

RM3762, RM3962, & RM1350

- Timed cycle. If no cooling for 30-45 minutes, a signal is sent to activate the interior light to create heat on the thermistor. Thermistor sends a signal to the control board to activate the cooling unit. Once the cooling unit is activated, the interior light turns off. Timer will reset at the end of the cooling cycle.

DMR702

- LED interior light = no heat. This model is equipped with a heater built into the lighting mechanism, which when activated, will create heat on the thermistor. Cycle is the same as the RM3762, RM3962, & RM1350.



Low Ambient Cont.

It's important to note that even with the Low Ambient Temperature Control that none of Dometic's refrigerators are considered "Four Seasons" units, regardless of an "Artic Package" installed on the RV.

It is advisable to the customer that they should be cautious of running the fridge in any temperature below 25 degrees Fahrenheit. The unit should NOT be ran at all in sub zero temps.

The mixture in the cooling unit may get so cold in these temperatures that it can begin to gel up and not flow through the coils as intended. As heat is applied to the mixture in this gelled form it can begin to solidify and this is another way in which a blockage is formed in the cooling unit. This is not a warrantable situation if the cooling unit is ruined due to this.



Once a blockage has formed in the cooling unit it is there permanently. It may move at times or float in the system but at some point it will create a restriction to flow of the cooling unit mixture.



Troubleshooting Frost Build Up

Common Culprits of Excessive Frost

- **Bad Door Gasket/Seal**
 - Verify gaskets are making a good seal all the way around by performing a “dollar bill test”.
- **Warped Door**
 - Use a straight edge around the door to verify possible warping.
- **Crack in Plastic Liner**
 - Closely inspect white plastic liner for any hairline cracks.
- **Warped Liner**
 - Use a straight edge around the white plastic liner where the door gasket meets for any possible warping.
- **Faulty Frame Heater (or, it has been disabled)**
 - Perform an ohms test on the heater (24 ohms +/- %10), verify it is plugged in to the board, some models have a button to turn the frame heater off.

Heavy Frost Build Up in Freezer



Situations where too much frost is building up in the freezer compartment and the issue is not related to the door seal/gasket, verify first that the frame of the fridge and/or the door is not warped.

If the issue is not related to the gasket or the door/frame, attempt to seal the circled area with some food safe silicone. This will help prevent warm and cold air mixing.

If the above suggestion fixes the issue, and the unit is under warranty, please contact our warranty claims team for payment regarding this repair.



Troubleshooting Erratic Operation

Symptoms of Erratic Operation

- Fridge randomly shuts down all together
- Works on a specific mode some days but not others
- Check light shows up with fridge still working & cooling
- Upper control board is lit up but no function from fridge
- Boards don't work one day and not the next for no reason

All of the above are situations you will see when there are underlying problems not caused by the fridge. 99% of the time Dometic components either work or they don't. You don't get boards that work one day and not another.

With any of the above symptoms, follow the next few slides for troubleshooting and verify we are meeting all the proper voltage requirements and eliminating any possible interference from other appliances within the RV.

Operating Requirements: Gas or Electric

- A minimum of 10.5 VDC at terminal block for controls to operate properly (Max 22 VDC).
- Upper Controls will stay lit with as little as 4 VDC but no function from the fridge unless voltage is maintained above 10.5 VDC.
- Best directly from a battery, if not from the battery then filtered side of the converter.
- **A dedicated fused circuit – Nothing else tied into the circuit!**



Check for AC Ripple (Dirty Voltage)

Dometic fridge control boards can handle a decent amount of AC ripple, or bleed over of AC on the DC lines. A maximum of 6 VAC is tolerated on the DC side of the control board.

A good RV convertor will filter ALL of the AC out of the DC lines and ideally no AC ripple will be present on the 12V side.

Upon symptoms of erratic operation from the fridge, do not rule this out as a possibility. There are a few ways to verify this is an issue or not.

To check for AC ripple set volt meter to check for AC voltage and see if any is present on the 12 VDC terminal block at the back of the fridge. If more than 2-3 VAC present, there is a likely chance of erratic or intermittent operation.

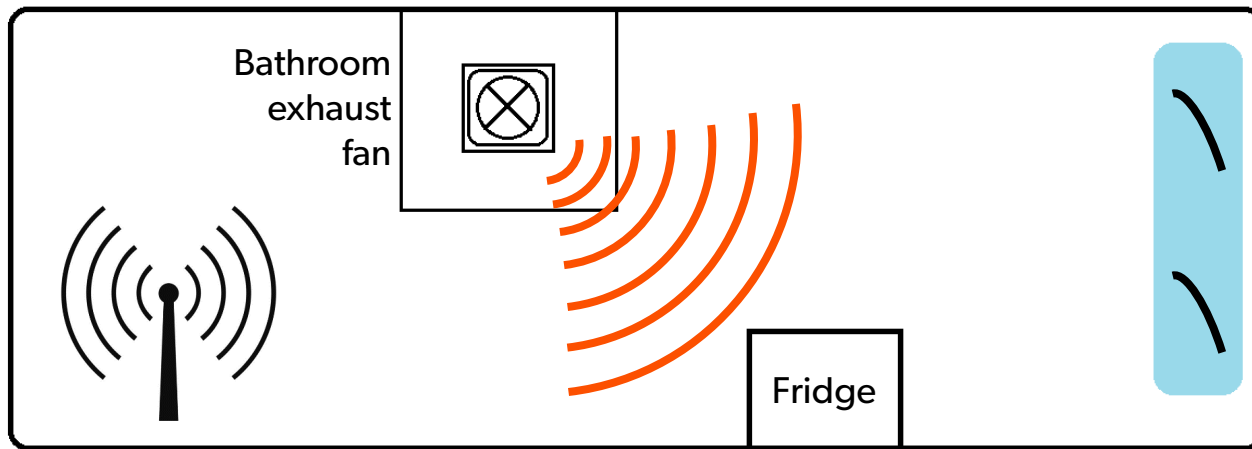
An Isolation test is also a good way to prove this issue. This requires disconnecting the 12 VDC lines supplied to the fridge coming from the RV convertor and supplying 12VDC from a separate source, like a deep cycle battery, or a jumper pack. If the fridge begins to operate as designed during the isolation test, dirty voltage is the likely source of the erratic or intermittent operation.

RF Interference (Radio Frequency)

With symptoms of weird or erratic operation, and all other electronics test good, you will need to eliminate the possibility of RF interfering with the lower control board. To test, completely deaden the RV (unplug shore power and disconnect the batteries), bring an alternate 12VDC source to the back of the fridge and run the unit isolated. This will essentially bench test the fridge without the need to remove it from the RV. If the problem persists, replace the lower control board.

Examples of some appliances that can put off RF:

- DC Brush Motors (fans)
- LED/Florescent Lights
- Cell Phone Chargers
- CB & HAM Radios
- Water Purifiers





Americana & Americana Plus

Mobile living made easy.

 **DOMETIC**

Upper Control Board

The function of the upper control board is to send commands to the lower control board

- Upper Boards are interchangeable between standard Americana and Plus
- Automatic or adjustable
- 2-way or 3-way

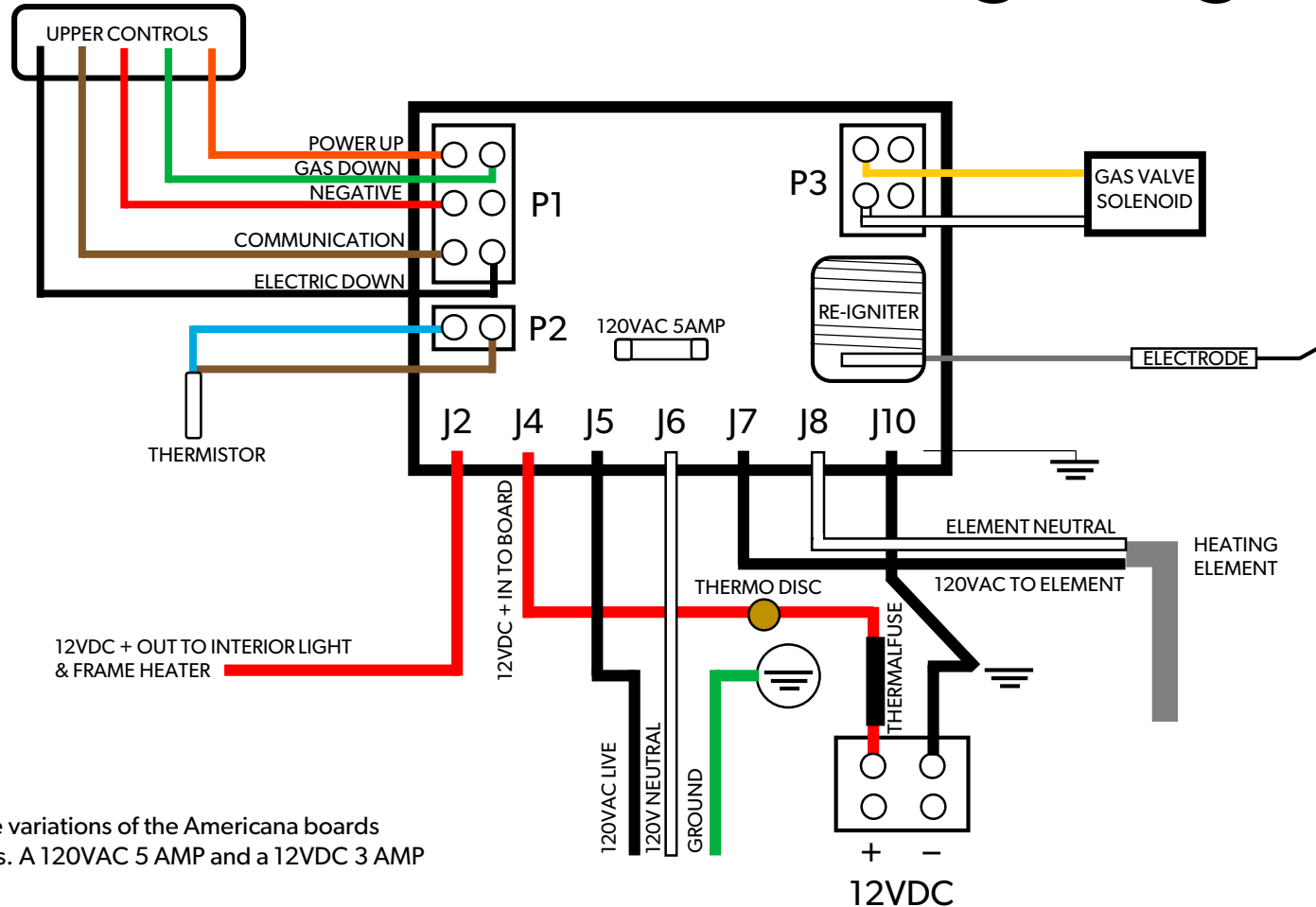
Americana - 2-Way

Americana Plus - 2-Way

Americana Plus - 3-Way



Americana Series Wiring Diagram

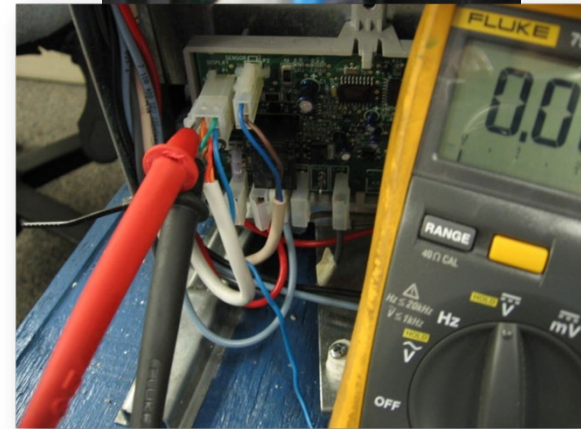
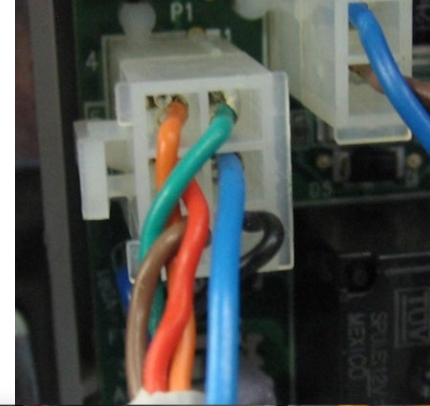


***NOTE:** Some variations of the Americana boards have two fuses. A 120VAC 5 AMP and a 12VDC 3 AMP

5/6 Wire Harness

Allows communication from the lower control board to the upper control board

- Test Harness by unplugging from P1 and checking continuity through each wire to chassis ground.
- Test communication with the harness plugged into P1 at the lower board.
- Turn on refrigerator.
- Check DC voltage at the 5/6 wire harness plugged into the P1 terminal on the lower board.
- Check from - **red** to + **orange** (power up to the eyebrow).
 - Note: If no voltage, check 3 amp fuse and also power at terminal block.
- Check from - **red** to + **green** (gas down) and - **red** to + **black** (electric down).



Lower Control Boards

REPLACES

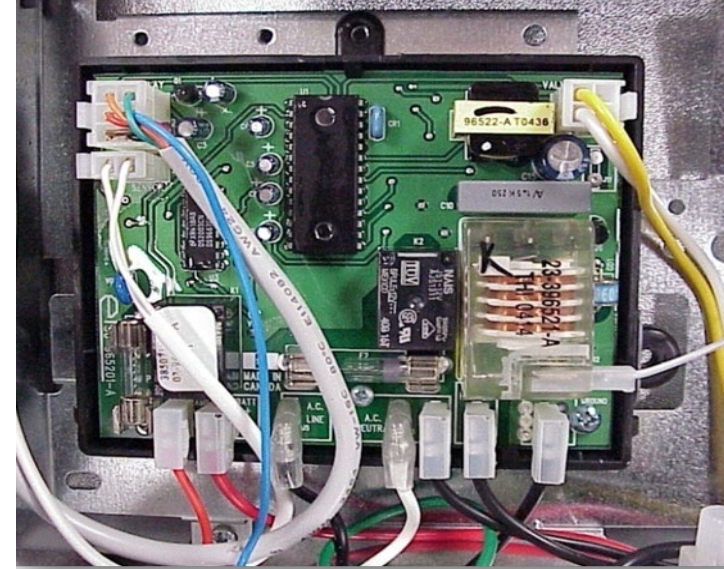
Hercules



Single Try Ignition System

- Sparks for 45 seconds before Check Mode

Integrated Ignition

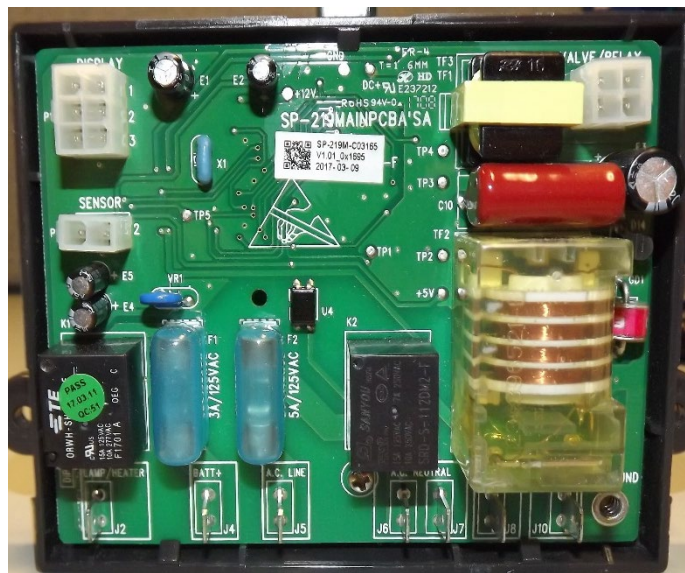


Three Try Ignition System

- 3 Cycles of Spark for 45 seconds before Check Mode

Lower Control Boards

ZhangBang

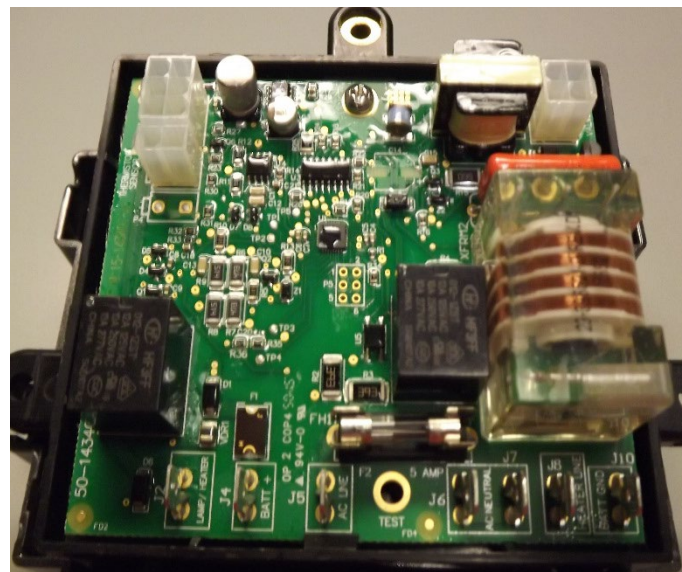


3 way vs. 2 way

Three Try Ignition System

- 3 Cycles of Spark for 45 seconds before Check Mode

Hercules

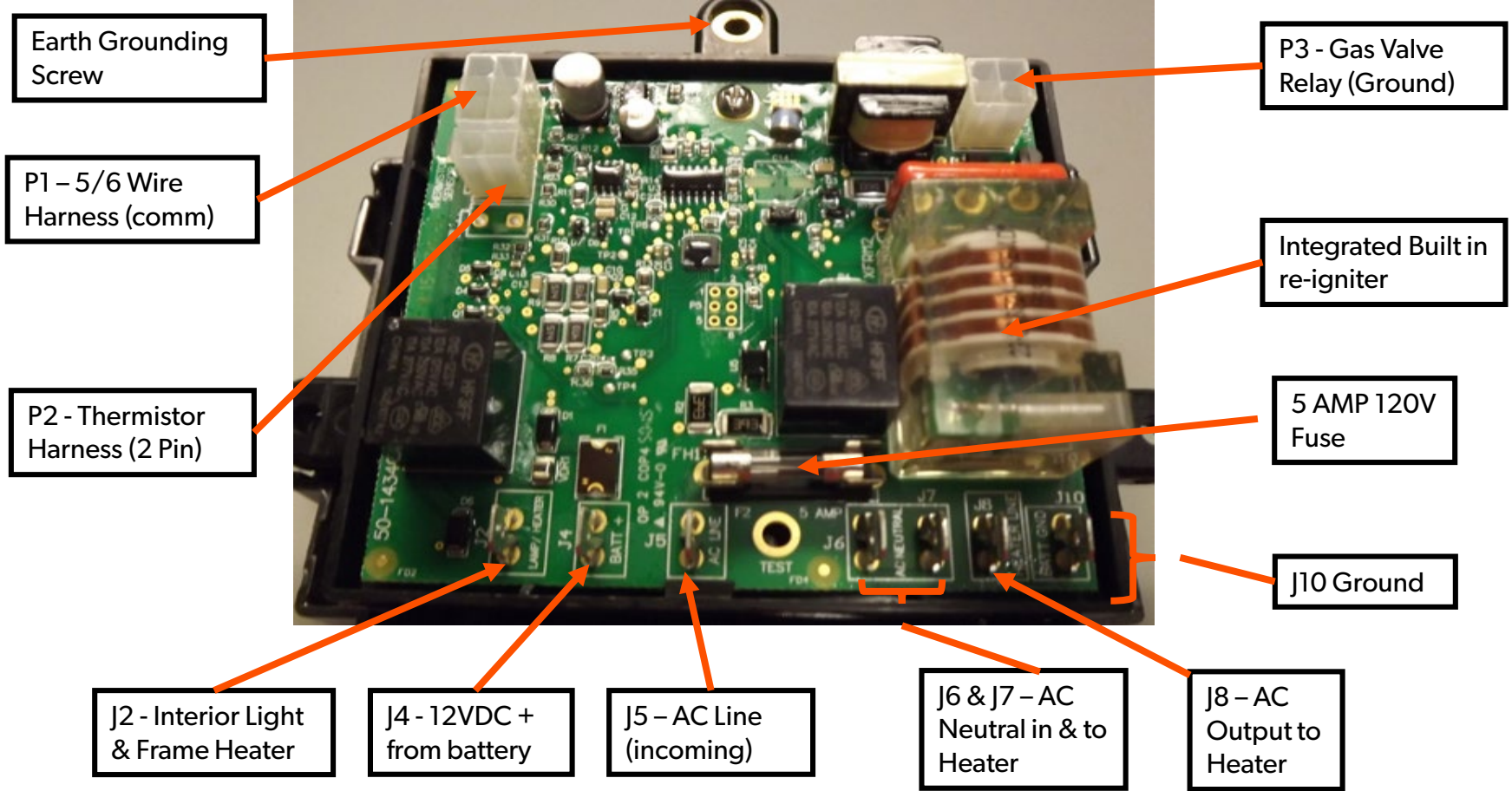


Single Try Ignition System

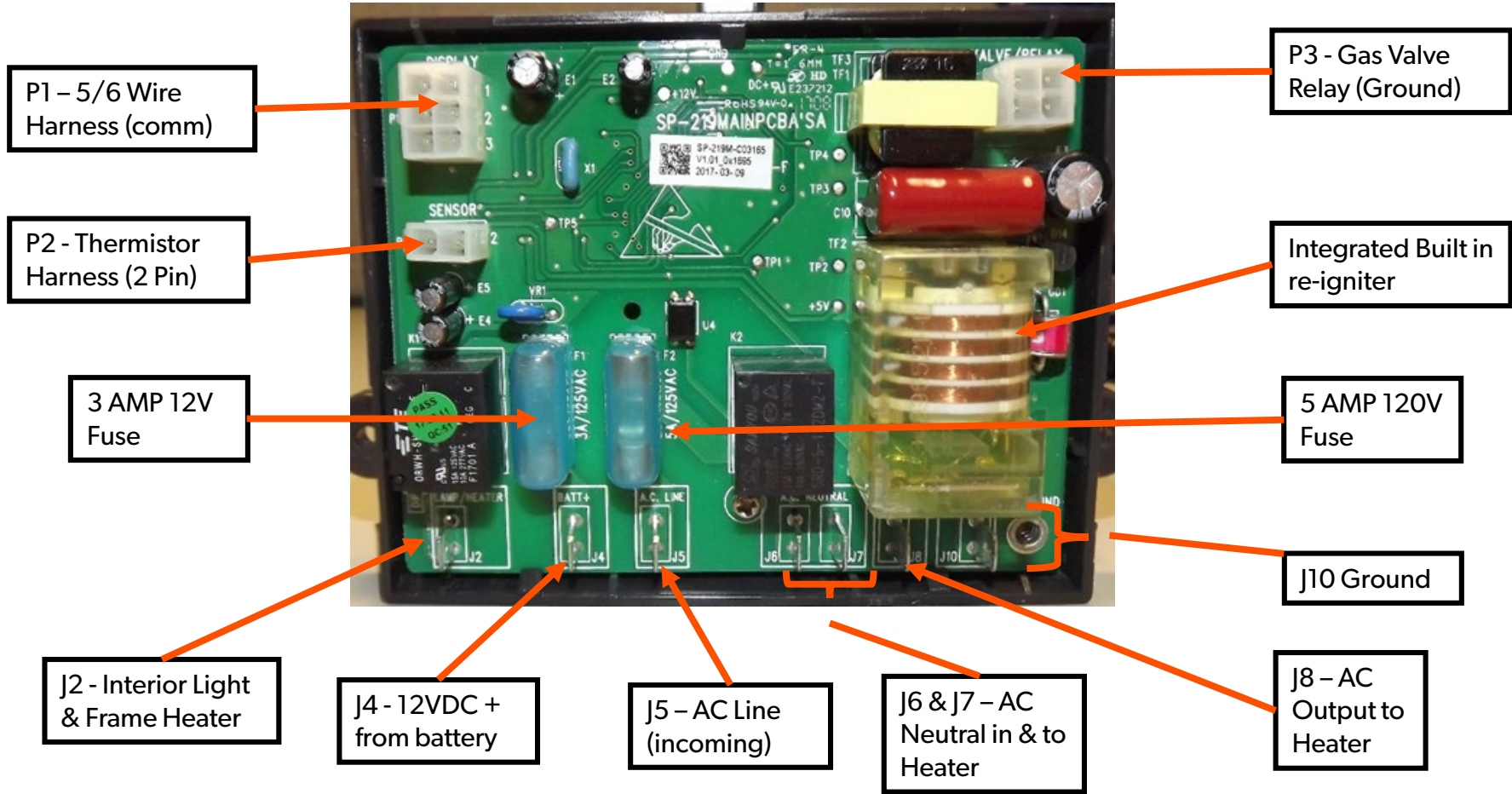
- Sparks for 45 seconds before Check Mode

***NOTE:** These boards are not interchangeable unless you change both upper eyebrow control and main lower boards together.

Hercules Lower Control Board



Zhang Bang Lower Control Board

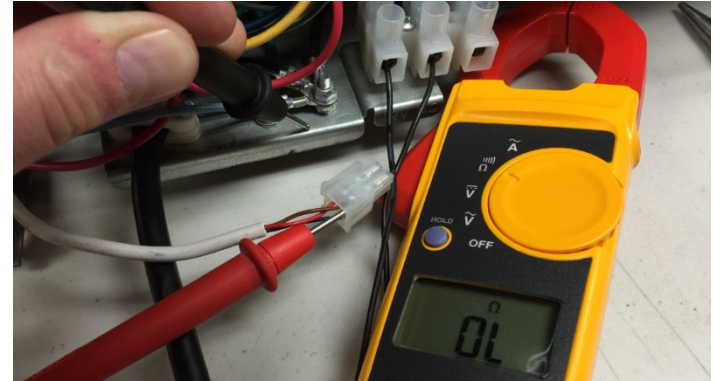
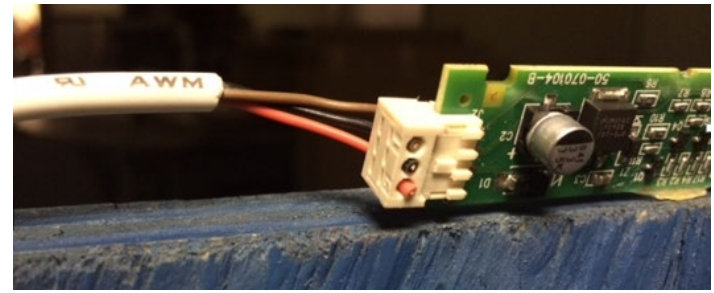




**RM3762
RM3962
RM1350
&
DMR702**









3 Wire Display Harness

- **Positive**, **negative** & **communication**
- Test for continuity on the **brown** communication wire
- Test for power on the + **red** and - **black** wire at the upper control board
- With both ends (top and bottom) unplugged, check each wire to chassis ground to verify the harness is not grounded, you should not have continuity

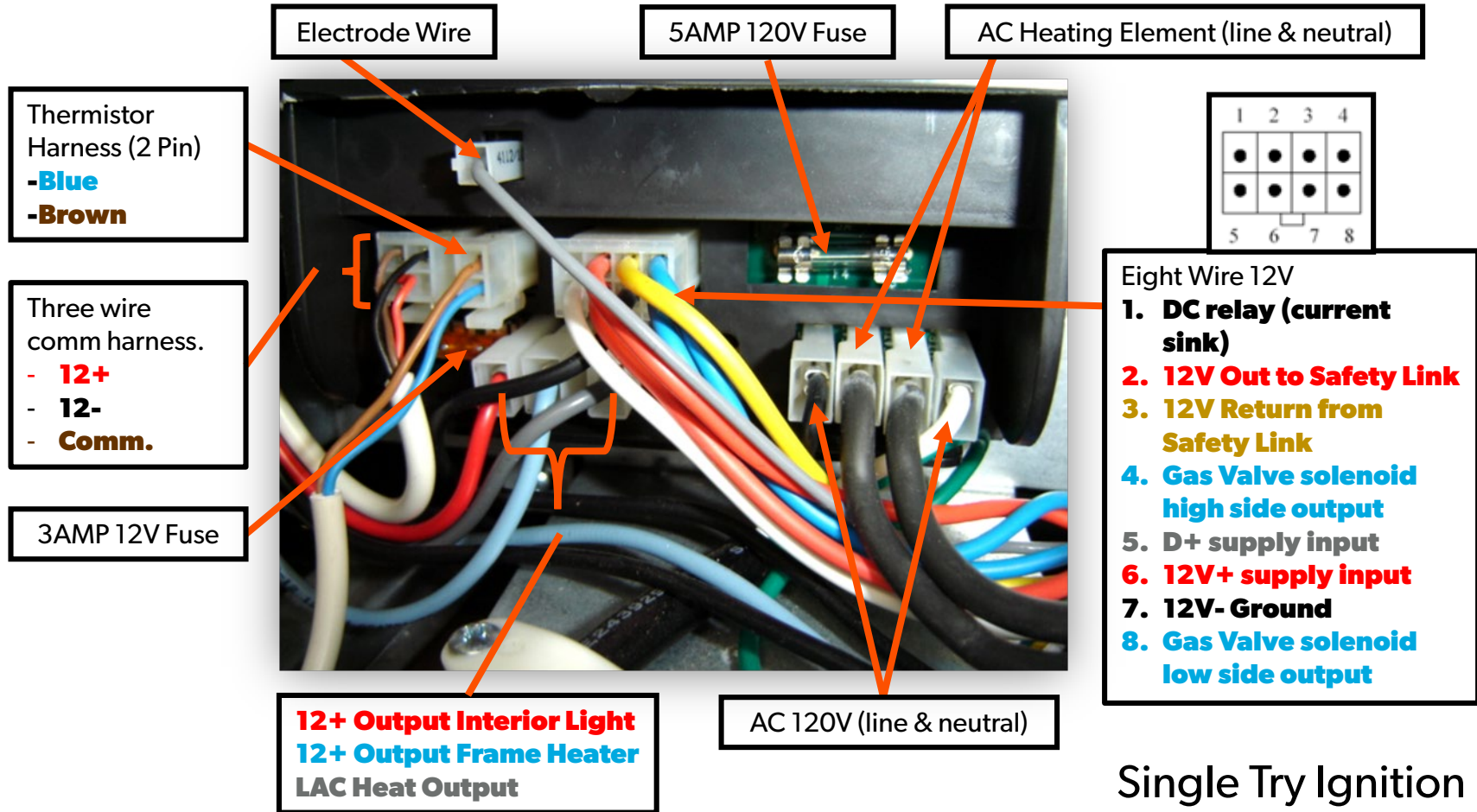


LED Display Panel



LED PANEL INDICATIONS		STATUS INFORMATION
Display is on		Refrigerator on
Display is off		Refrigerator off
The AUTO indication dot is lit.		AUTO mode and AC operation
The AUTO and LP indication dots are lit.		AUTO mode and LP gas operation
The AUTO indication dot is lit. LP dot flashing slowly.		Temporary gas lockout. Only in AUTO mode. 15 min ignition refueling delay.
The LP indication dot is lit.		Manual LP gas operation mode.
Digits Note: Fresh Food temp is an average over time – not actual	 	Fresh food temperature. Thermostat range setting (1 – 5). Temporary during setting. Setting stores automatically after 5 seconds.
Message indications:		Fresh food compartment temp is above measurement range.
“LP” Flashing		LP Gas operation lock out. (Check LP)

Lower Board (Hydra Board)



Diagnostic Mode

RM3762

RM3962

RM1350

To enter the diagnostic mode:

- Turn off the refrigerator
- Press and hold the **TEMP SET** button and then press the **ON/OFF** button
- Release the **TEMP SET** button
- Use **TEMP SET** button to toggle the list of functions step by step



Diagnostic Mode Continued

RM3762, RM3962, & RM1350



Number	Test Function	Test Indication	Test Result Indication
1	All outputs Off	F	E0 = Communication Fault E2 = Temp Sensor Fault Actual temp at the sensor (F)
2	Turn LAC heater On	LH	E0 = Communication Fault ON = LAC Heater on Pressing the lamp switch, the lamp should remain on.
3	Turn AC heater on	AC	E0 = Communication Fault ON = AC heater on " " = AC heater off, AC not available.
4	D+ status (if D+ is connected) Not available on all model.	DP	E0 = Communication Fault ON = D+ high " " = D- low
5	Run Gas (one attempt only)	LP	E0 = Communication Fault E1 = Igniter & valve off, gas hardware fault ON = Igniter & valve on FL = Igniter off & valve on, flame detected " " = Igniter & valve off, gas problem (check gas) (If flame is not ignited within 45 secs.)

Error Codes (RM3762, RM3962, & RM1350)

- **E0** – No communication between display & power module
 - Test 3 wire harness. Make sure you have continuity and good contact. Check each wire to chassis ground
 - Clean all grounds
 - Try straight-line DC voltage and deaden the coach (this will eliminate interference or RF [Radio Frequency])
 - If problem continues, replace lower control board
- **E1** – Hardware fault in the gas operation system
 - Test gas solenoid
 - Clean all grounds, Lower Board, Gas Valve, & Convertor. E1 error codes are often due to loose or bad ground connections
 - Test wire harness and upper control board
 - Try straight-line DC voltage and deaden the coach
 - If problem continues, replace lower control board






Error Codes Cont.

- **E2** – A failure of the temperature sensor or associated electronic circuitry has occurred.
 - Make sure the thermistor is plugged in
 - Test thermistor by taking an ohms reading
 - Test each wire to chassis ground
 - On rare occasions the lower board cannot detect the thermistor
- **E3** – Overheating thermostat is disconnected/one of the two safety fuses has popped or lost continuity.
 - Trace 12V through both thermal and thermo fuses to find where the break is
 - Check for poor ventilation
 - If happening on AC only, make sure the heating element is in the pocket. Also try rotating the flue shielding to move the sensor further away from the heating element.
 - If occurring on both modes, replace the thermo disc.
- **E4** – DC voltage out of range. Below 8 or above 18 VDC

Error Codes – DMR702-D

The DMR702-D uses the same lower control board as the New Gen. (RM3762, RM3962, & RM1350) the Hydra Board, but does not have the digital display in the upper right hand corner of the unit. It will display any error codes via the temperature bar as the lights blink in the following sequences...



ERROR CODES	INFORMATION
 E0	Communication issue between upper display and lower control board.
 E1	Disconnected gas valve or hardware fault in the gas operation system. Ignition failure.
 E2	Thermistor is defective or removed. Possible issue with the lower control board not detecting the thermistor. If resistance is present on the thermistor, board is defective.
 E3	One of the over protecting fuses (Thermo/Thermal) in line with the 12 VDC has popped or lost continuity. <div data-bbox="1290 954 1812 1048">Note: Could be lights 2 & 3 or 1 & 2 (only error with 2 lights)</div>
 E4	DC voltage is out of range (exceeds or drops below limit values approx. (8-18 VDC)).

Error Codes – DMR702-D




The DMR702 uses the same lower control board as the New Gen. (RM3762, RM3962, & RM1350) but does not have the digital display in the upper right hand corner of the unit. It will display any error codes via the temperature bar as the lights blink in the following sequences...

These error codes are the same codes that were represented on the "New Generation" units (3762, 3962, & 1350) from the previous two slides. All of the testing, troubleshooting, and diagnostics would be the same. The codes are simply displayed differently since there is no LED digital display readout in the upper right hand corner of this model refrigerator.

Error Codes – DMR702-C & -E

The DMR702-C uses the same lower control board as some of the Americana units (the Zhang Bang Board). It will display any error codes via the temperature bar as the lights blink in the following sequences...



ERROR CODES	INFORMATION
	Communication issue between upper display and lower control board.
	Thermistor is defective or removed. Possible issue with the lower control board not detecting the thermistor. If resistance is present on the thermistor, board is defective.
	Disconnected gas valve or hardware fault in the gas operation system. Ignition failure. The LP light will also flash if this occurs.

Electric Components

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 **DOMETIC**

Heating Element

The function of the heating element is to provide the boiler with a specific amount of BTU's of heat

AC Heating Element 6-10 cubic ft.

Ohms – Approx. 44 +/- 10% (At room temp.)

Amps – Approx. 2.7 (During operation)

Watts – 325

Series AC Heating Element for Side by Side

Ohms – Approx. 34.3 +/- 10% (At room temp.)

Amps – Approx. 3.5 (During operation)

Watts – 420

DC Heating Element (not shown) 6 cubic ft.

Continuity – yes or no

Amps – Approx. 18 (During operation)

Watts – Approx. 215

Note: Only use DC heating element when driving from location to location or to maintain temperature.



Not working on Electric– Works on LP

- ☐ Minimum of 10.5 VDC to maximum of 22 VDC
- ☐ Check grounds and neutrals
- ☐ Upper control board will stay lit at 4 VDC, but no commands will be sent to the lower board
- ☐ Check incoming AC voltage – 120V +/- 10%
- ☐ Test Heating Element – Ohms, Amps & visual inspection
- ☐ Double check wiring – refer to wiring diagram
- ☐ Unplug the thermistor from the lower control board (P2) during lower board testing to assure unit is calling for operation

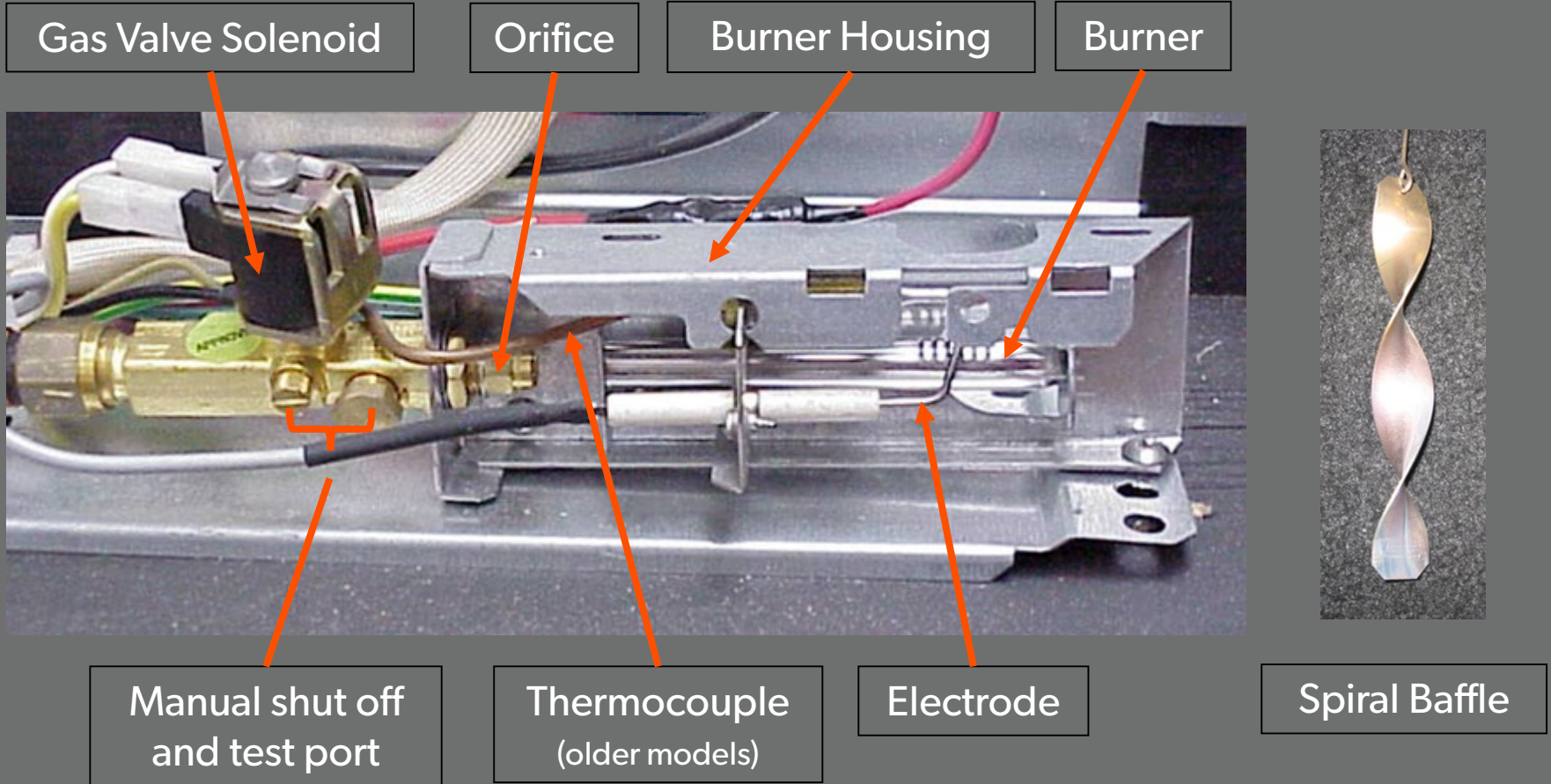
If all of the above tests within specifications and is correct but the problem is persistent, replace the lower control board.

Gas Components

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 **DOMETIC**

Gas Components

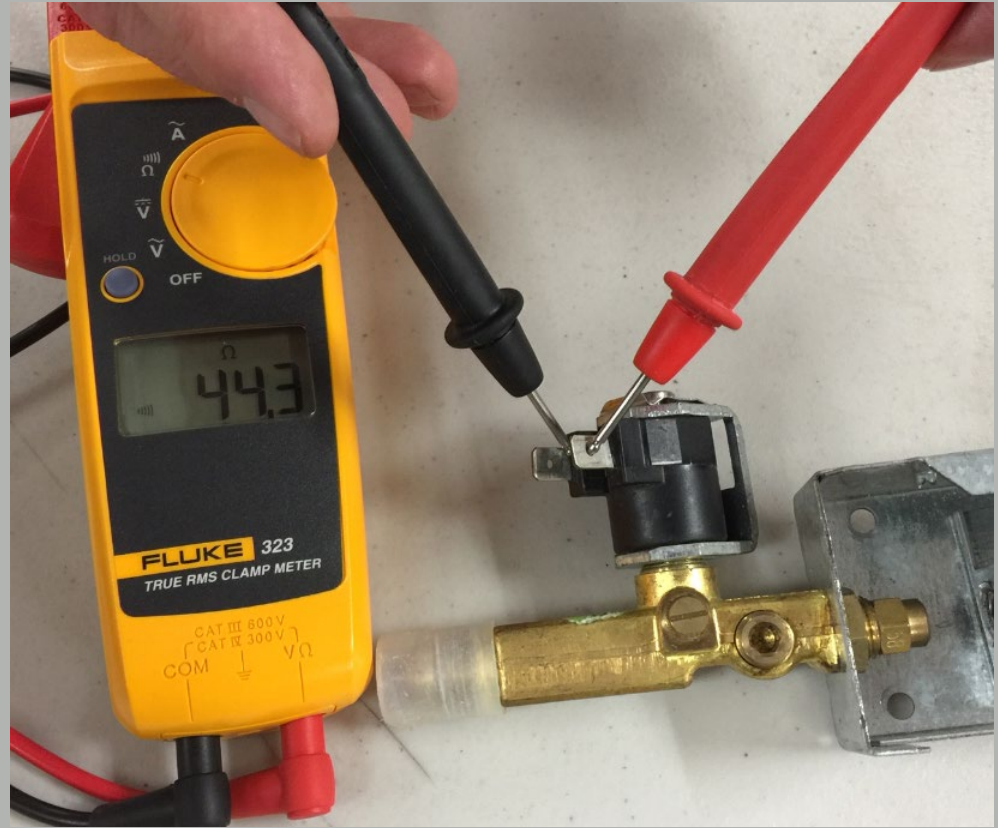
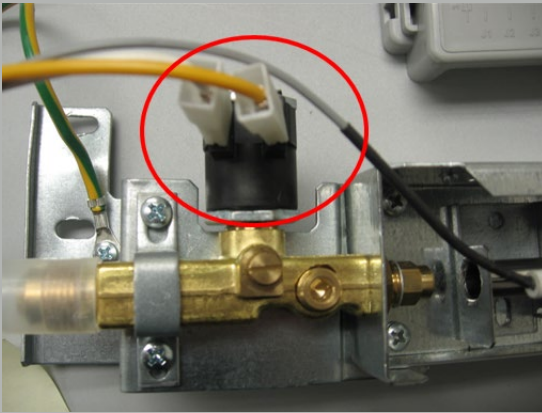


Gas Solenoid

The function of the gas solenoid is to allow gas to flow through the gas valve assembly

Symptom: Check light or no LP (gas)

- Needs at least 9.6VDC to open
- Ohms: 49 +/- 10%



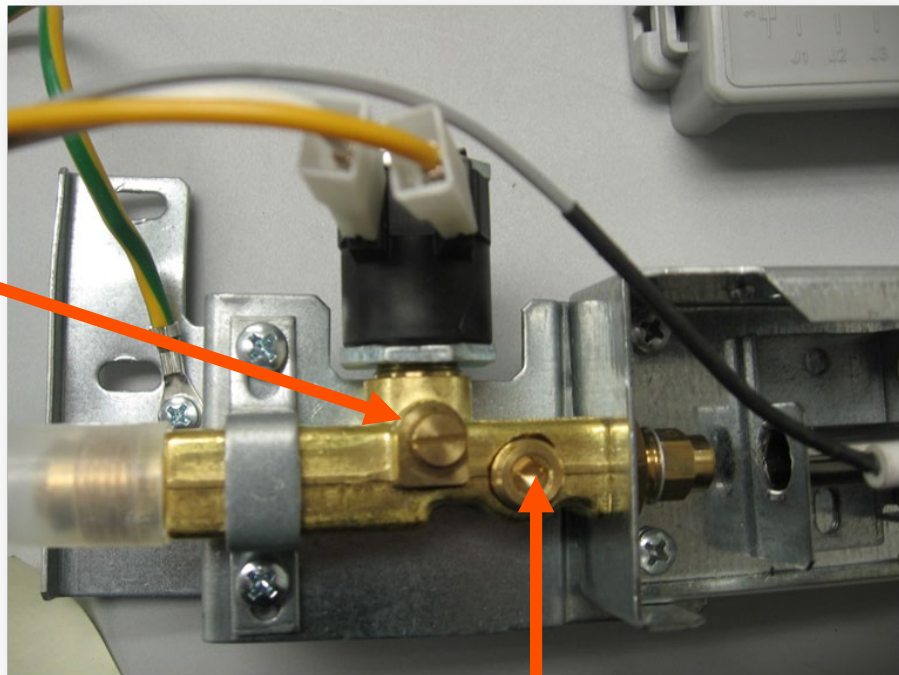
Manual Shut Off Valve & Test Port

The gas valve is responsible for allowing gas to the burner chamber

Symptom: Check light or no LP (gas)

- Check the manual shut off valve
- Horizontal = open
- Vertical = closed

Test Port: When checking the gas pressure in the system always check at the gas valve test port.



Orifice

The orifice provides a pre-determined amount of gas to the burner.

- The orifice has a man made ruby inset that allows LP to mix with air in order to get combustion.

Symptom: Check light or no LP (gas)

- Check to make sure orifice is the correct size
 - Only authentic Dometic parts should be used, otherwise voids the warranty.
- Check the orifice for debris.
 - The smell of LP attracts many insects; nats, flies, mud daubers, spiders, ect...
- Use **ONLY** alcohol based solvent to clean.
 - **DO NOT** blow compressed air or stick anything into the ruby.
- Soak in solvent & allow to air dry.



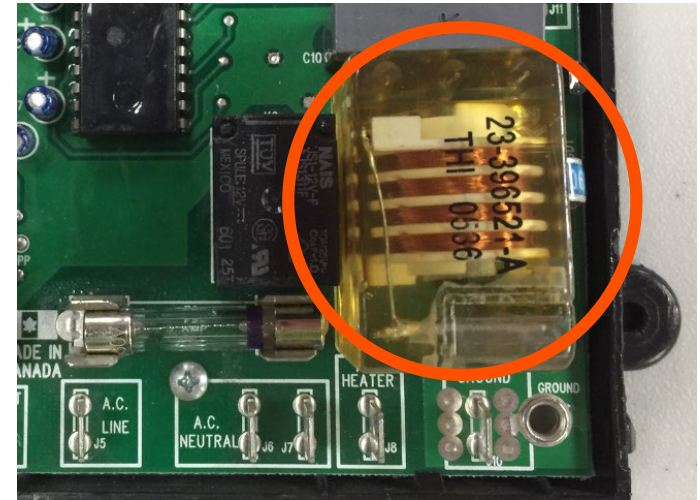
Re-Igniter

The function of the re-igniter is to sense resistance through the flame between the electrode and the burner

- No flame = high resistance, causing the igniter to spark.
- Flame lit = decreased resistance, causing the igniter to stop clicking (flame rectification)
- 12V transformer, puts out 17K volts

Symptom: Check light or no flame. No sparking sound or continuous sparking sound.

- Verify voltage at + yellow and – black (ground)



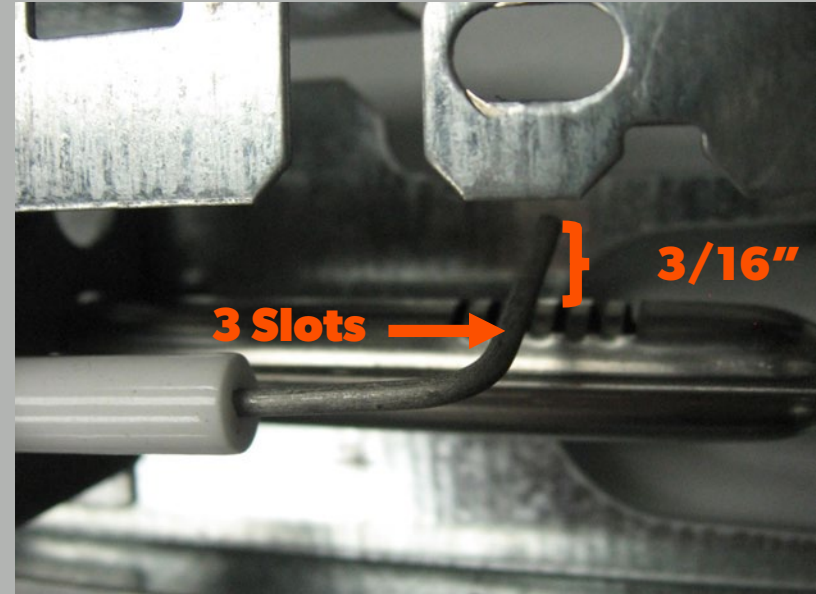
Electrode

The electrode passes the spark to the burner to ignite the fuel

Flame Rectification

Symptom: Check light or no spark

- Check for cracks or breaks in the ceramic
- Check for moisture
- Make sure it is in the proper location
 - 3/16" above the 3rd slot on the burner (thickness of a nickel)

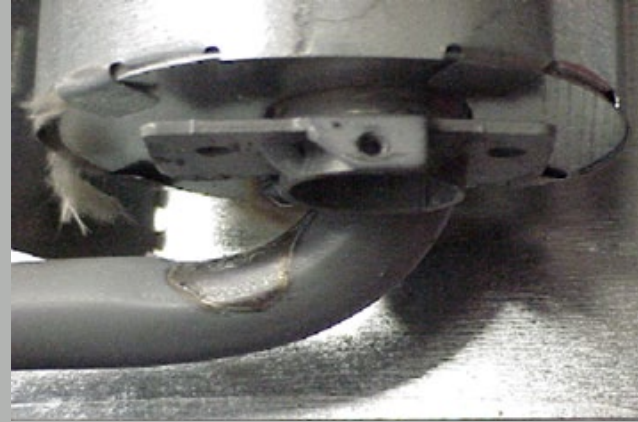


Flue Tube & Flue Baffle

The flue baffle helps slow the process of heat rise in the flue tube. The flue tube is where heat is transferred to the boiler at the weld point.

Symptom: Cools on 110 but not on LP

- Check that baffle is present (new baffles do not come with replacement cooling units)
- Clean flue tube/baffle of carbon build up
- Check water column (gas pressure)



Troubleshooting A Check Light



- DC power supply – If DC voltage drops below 9.6 VDC
- AC ripple on DC line, max of 6 VAC (dirty voltage)
- Gas Supply – Low pressure (less than 11" water column), or failure of a gas component.
- Grounds – Often a bad or loose ground can cause a check light. Disconnect and re-strip new grounds at:
 - Lower Control Board
 - Gas Valve
 - Converter

Not Cooling – Works on Electric

- ☐ Minimum of 10.5 VDC to maximum of 22 VDC
- ☐ Upper control board will stay lit at 4 VDC, but no commands will be sent to the lower board
- ☐ Check incoming Gas Pressure – 11" water column
- ☐ Test Gas Valve – check DC voltage to valve and Ohms
- ☐ Verify positioning of electrode to burner
- ☐ Unplug the thermistor from the lower control board (P2) during lower board testing to assure unit is calling for operation

If all of the above tests within specifications and is correct but the problem is persistent, replace the lower control board.



8-Series

RM8

RMD

RML

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8-Series Display

AES



Button Functions from left to right

AES:

1. Power
2. 120 VAC
3. Gas
4. 12 VDC
5. Automatic
6. Temperature Selection
7. Fault Indicator Light

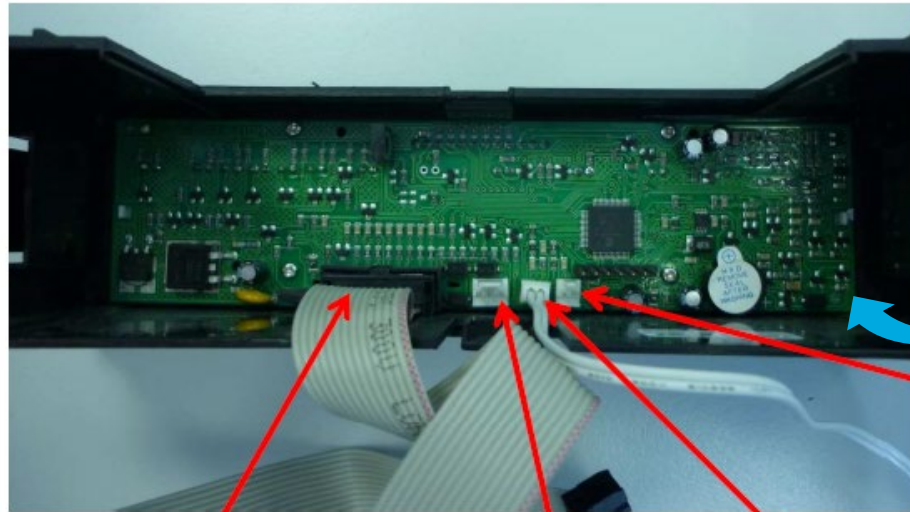
MES



MES:

1. Power
2. 120 VAC
3. Gas
4. 12 VDC
5. Temperature selection
6. Fault Indicator Light

Current 8-Series Display Connections



P860 (P870)
connection

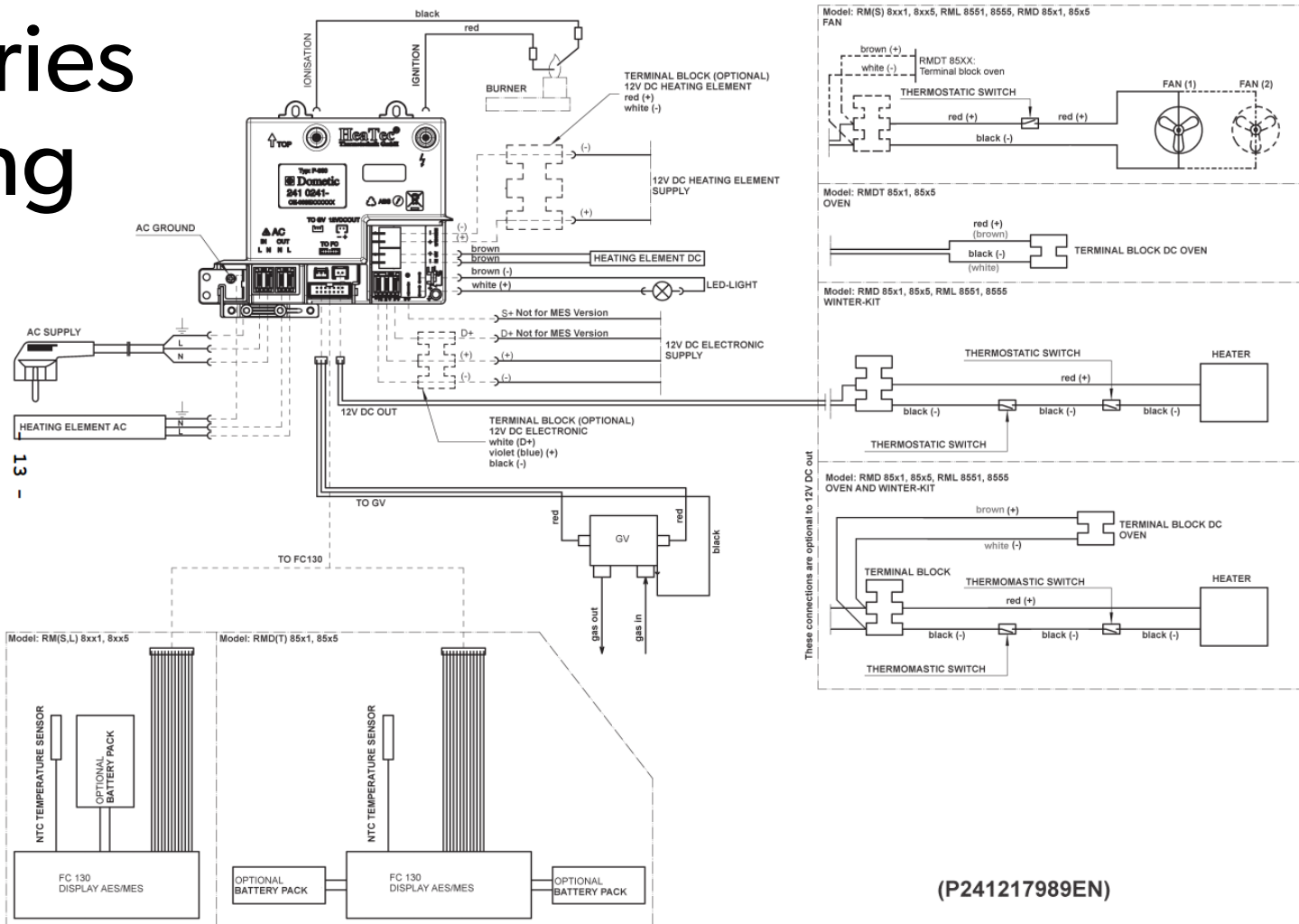
External operating
display connection
(only RMD 8XXX)

NTC (temperature
sensor) connection



Battery power
supply (internal
battery) connection

8-Series Wiring



(P241217989EN)

8-Series Thermistor

- NTC Sensor (Negative Temperature Coefficient)
- Installed at far left fin on the bottom
- All operation modes (DC/AC/GAS) are controlled thermostatically



Temp - °C/F

0/32

5/41

10/50

15/59

20/68

25/77

kOhms

27.7

22.29

18.07

14.74

12.11

10.00

8-Series Heating Element

3.7 CF AC

Ohms – 107

Amps – 1.13

Watts – 135

4.3 CF AC

Ohms – 76

Amps – 1.6

Watts – 190

DC Heater

Amps – 11 to 14

Ohms - .8 to 1.1



8-Series Operation AES & MES

Normal Operating Mode

- The active buttons are backlit when pressed and go into dim mode after approximately 10 seconds. The backlighting is completely activated when pressed again; the function is initiated during the second press. An audible confirmation is made by the beeper for each button press.

On/Off

- The refrigerator is switched on using the on/off symbol; the button must be kept pressed for more than 1 second for the button to activate. The symbol is backlit when on.

Energy Selection

- The energy type is selected by pressing the respective energy type symbol button. The symbol lights after it has been pressed.
- When the automatic symbol is active, the automatically selected energy type symbol is also active.
- Auto mode priority selection: **1.)** 120 VAC **2.)** 12 VDC if D+ terminal active **3.)** Gas

Operation Cont.

Refueling Delay

- After switching off the D+ signal, the changeover to gas is delayed by 15 minutes.

Cooling Temperature Selection

- Select the temperature using the 5 stage temperature symbol. The respective bars are lit (ex. Temperature level 3 = 3 bars from left to right are backlit).

Interior Lighting/Door Open Check

- The interior light is activated by opening the door. It is switched off by closing the door. If the door stays open for longer than 2 minutes, there is an audible warning for approx. 15 seconds, which repeats every 2 minutes.



Fault Indicator

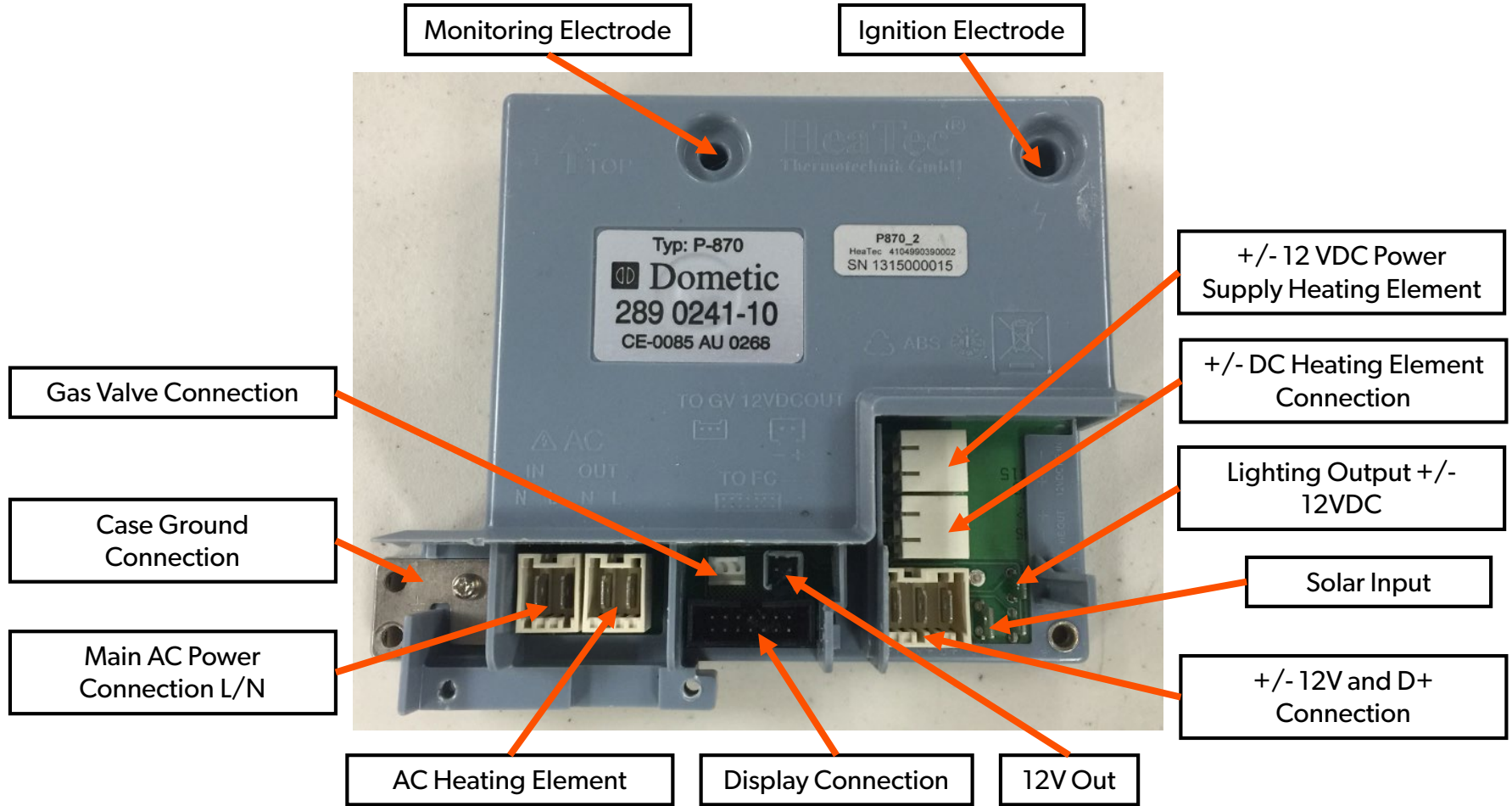
- If the energy type is not available or 3 ignition attempts in gas operation were unsuccessful, the fault indicator flashes in parallel with the energy types symbol. An audible alarm also sounds for approx. 20 seconds. This alarm repeats every 30 minutes.

Internal Battery/Self Sufficient

- Gas operation with units that have the internal battery power supply option can only be activated if the external 12 VDC power supply is not available.
- If the unit is set to gas operation when the internal 12 VDC power supply is available and the external 12 VDC power supply fails, the unit automatically switches to internal battery power supply.
- The internal battery power supply consists of 8 AA batteries and has a service life of approx. 2 weeks.
- The self-sufficient operation also functions with 4 AA batteries and has a service life of 1 week.



8-Series Power Module



8-Series Error Messages



Fault	Display
No 120V or under 95V tolerance	Fault LED flashing with plug LED; audible signal for 20 sec repeats every 30 min.
No 12V or under 10.5V tolerance	Fault LED flashing with battery LED; audible signal for 20 sec repeats every 30 min.
Gas empty or ignition attempt failed	Fault LED flashing with gas LED; audible signal for 20 sec repeats every 30 min.
Thermistor defective or removed	All temp bars flash; unit goes into mode of 45 min on / 15 min off
AC heating element defective (Unit will not be switched off)	Fault LED flashing with plug LED and all temp bars; audible signal for 20 sec repeats every 60 min.
DC heating element defective (Unit will not be switched off)	Fault LED flashing with battery LED and all temp bars; audible signal for 20 sec repeats every 60 min.
Door open longer than 2 min	Audible Signal for 20 sec and repeats every 5 min



8-Series Gas Components

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Burner Control Device

Includes:

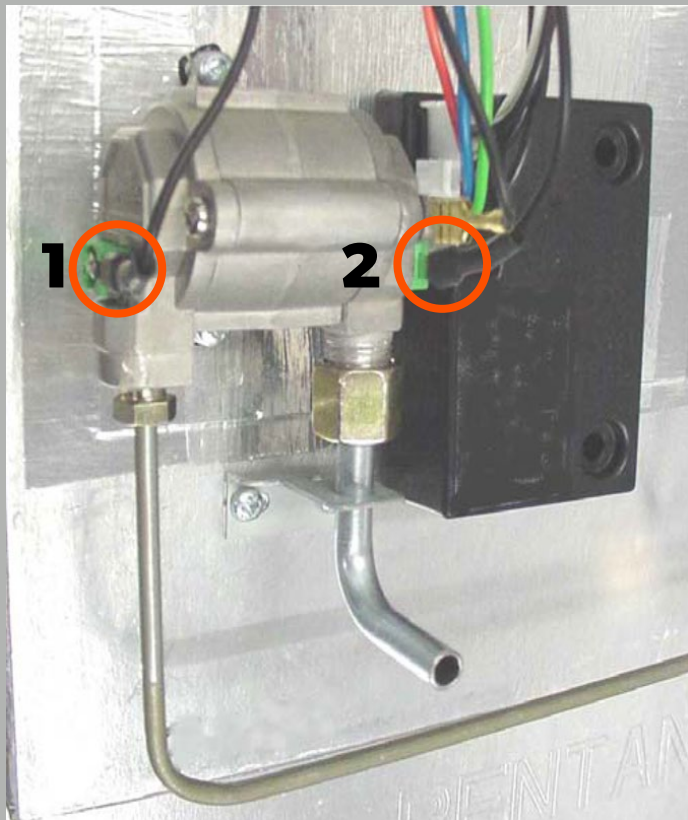
- Igniter (20-30) seconds
- Flame control & flame failure device
- Gas valve control
 - Stops ignition and gas input in the event of a gas fault

Power Supply & Testing

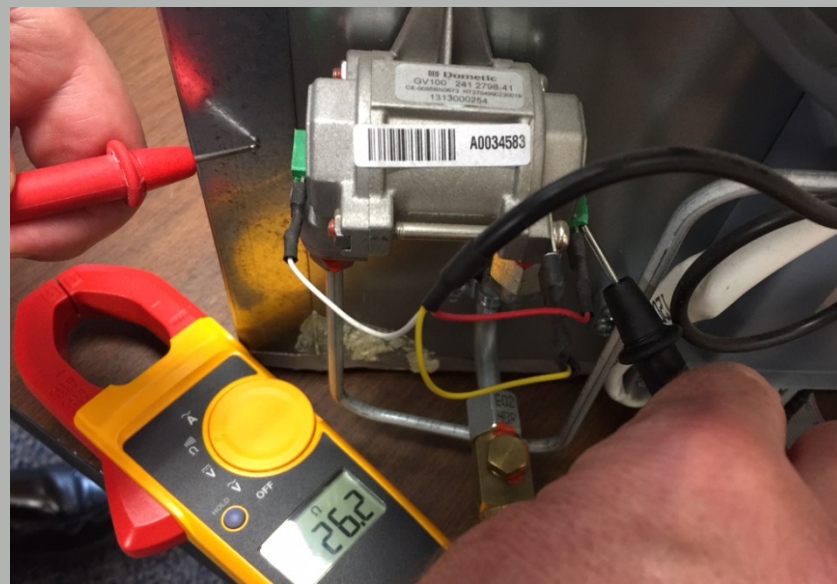
- Approximately 1.3 VDC to activate
- Measure between pin 2 and pin 3 for voltage.



8-Series Gas Valve Assembly



- 2 serial mounted gas valves
- Approx. 1.3-1.5 volts per valve (if switched on approx. 0.7-0.9 volts)
- Measure volts and resistance
 - Valve 1: Pin 1- Ground (Housing)
 - Valve 2: Pin 2- Ground (Housing)
 - 28.5 ohms +/- 10% per valve





Optional Ice Maker

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Ice Makers

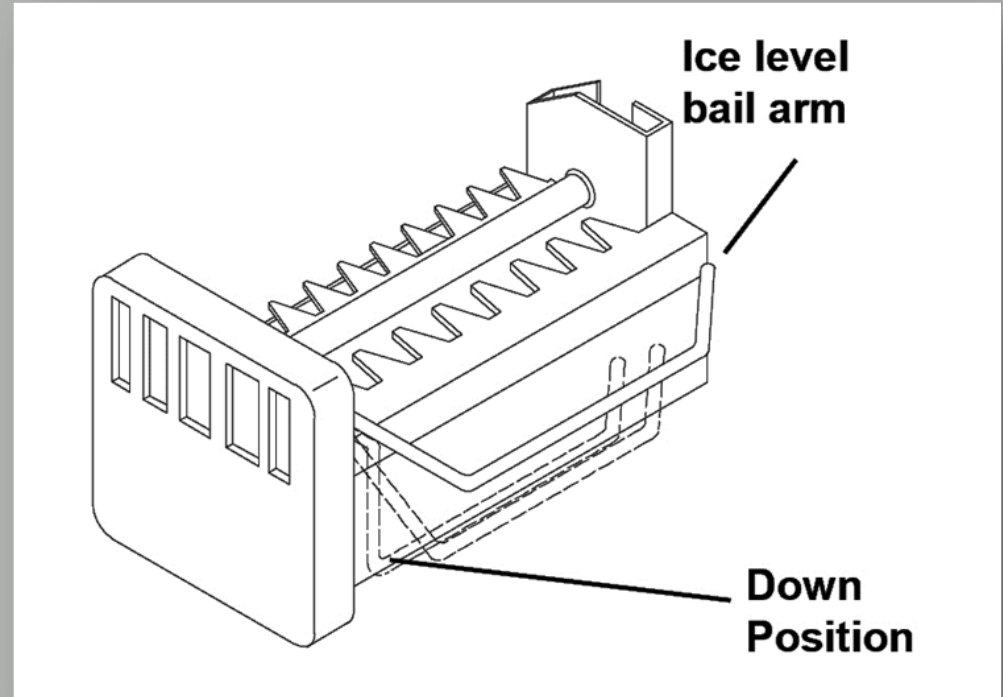


- All ice makers require 120 VAC to operate. Even though the freezer will get cold enough in gas operation, the ice maker will not operate unless plugged into a 120 VAC source.
- If working conditions are met, will dump approximately 5-6 times in a 24 hour period, making approximately $\frac{1}{2}$ to $\frac{3}{4}$ of a bucket total.
- Allow refrigerator to pre-cool before starting the ice maker

Troubleshooting

Symptom: No operation/not making ice

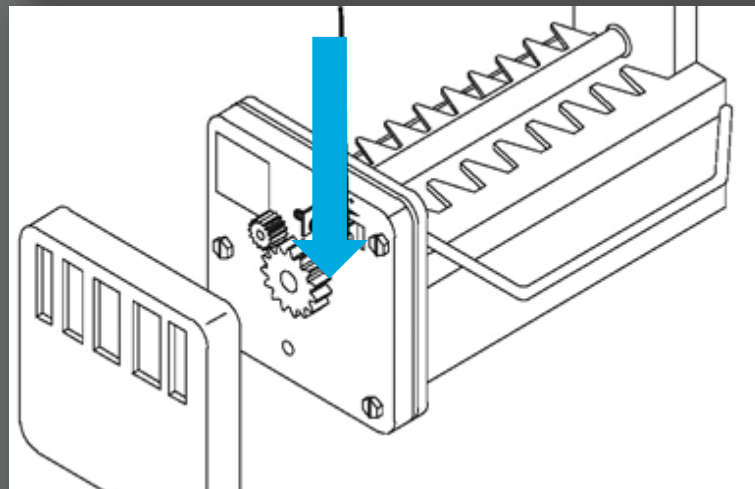
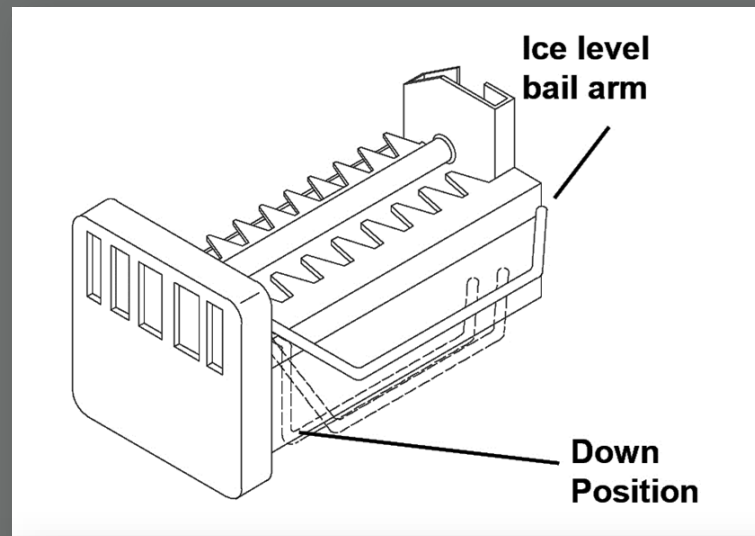
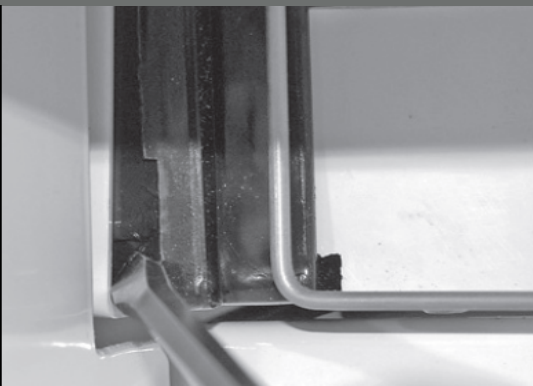
- What is the temperature at the ice maker?
- Verify 120 volt power at the ice maker
- Verify bail arm is down
- Verify manual shut off valve is open
- Check water line for damage



Mold Thermostat

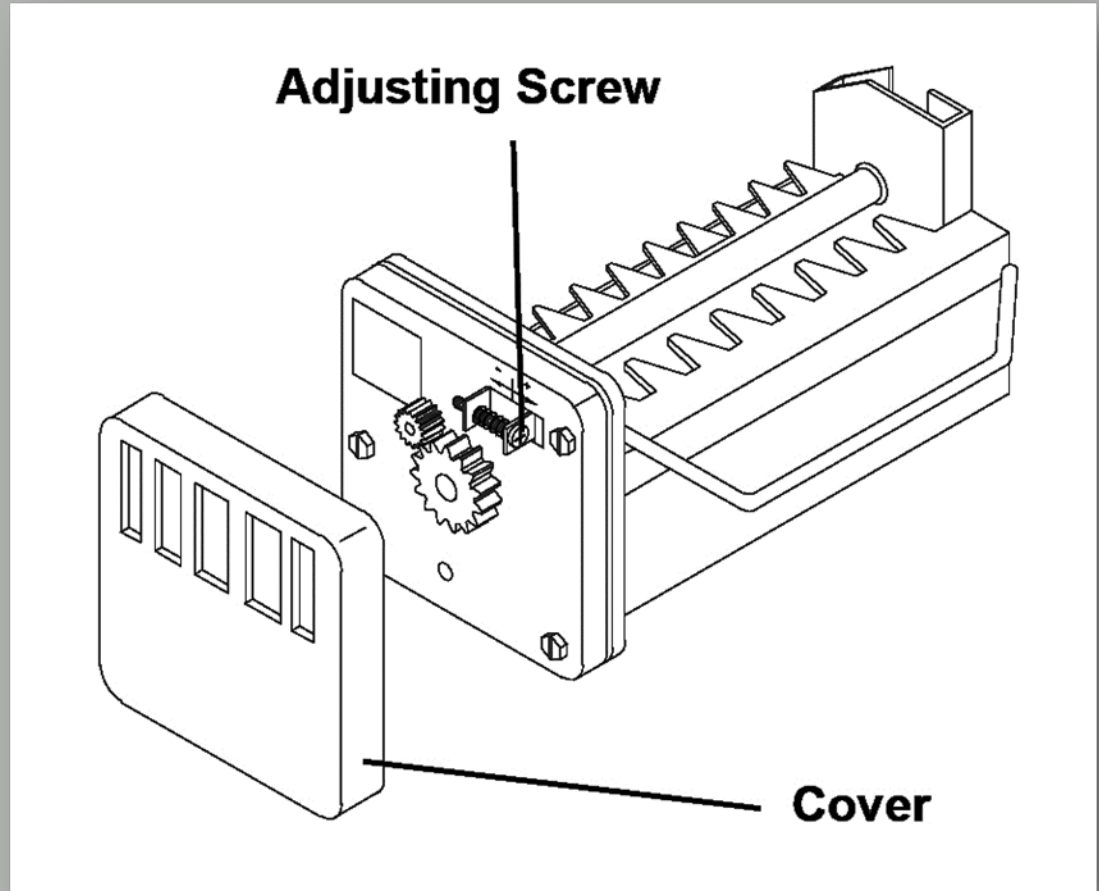
- Bi-metal switch.
- Starts an ejection cycle by closing at 12°F
- The reset temperature is 50°F +/- 5°.
- To test:
 - Put a glass of water or anti-freeze on the shelf by the ice maker. Take the temperature of the liquid.
 - Bypass the thermostat by turning the large white plastic gear clockwise a half of a turn and forcing the ice maker into a cycle.

To remove the protective cover from the ice maker mechanism. Using a flat-head screwdriver, place the tip of the screwdriver in the slot. Twist the screwdriver blade gently to loosen the cover.



Adjusting The Water Fill

- Turn screw as necessary toward the "+" or the "-" side.
- One FULL turn either way will make a 18cc change in the amount of water.
- Do NOT turn the screw more than one full turn at a time.

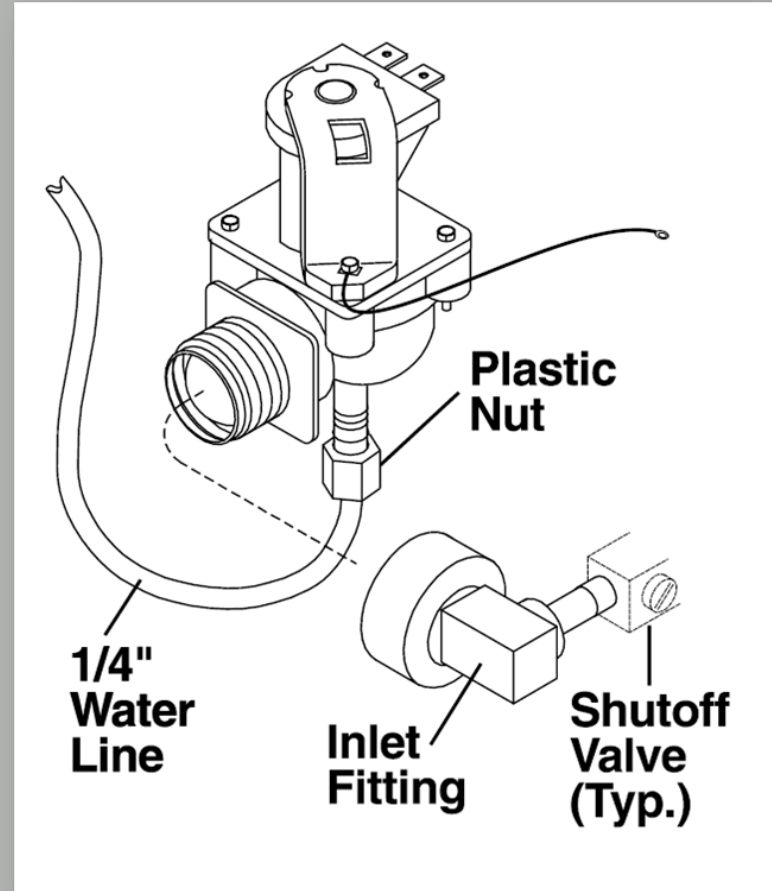


Icemaker Water Valve

- Valve is solenoid operated
- Ohms Resistance 200-500
- 10-15 watts will energize the coil
- When the solenoid is energized, a voltage drop may occur

Symptom: No water in mold. Have already manually cycled ice maker.

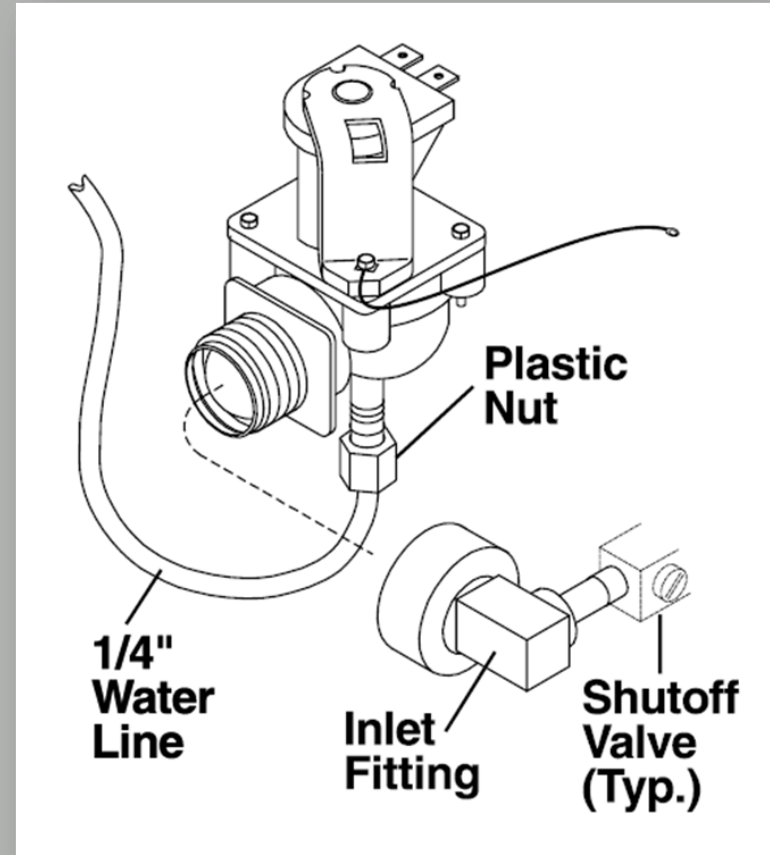
Test: Check ohms on solenoid coil, see if solenoid is energized when ice maker is calling for water.



How To Drain The Ice Maker

(for winterization)

- Close the shutoff valve
- Place a pan under the solenoid valve
- Remove the inlet fitting from the water solenoid valve
- Drain water from the water line
- Remove the plastic nut and water line from the outlet side, then drain.
- Cycle ice maker several times while blowing compressed air through the solenoid
 - Up to 40 PSIG



Any Questions?

- Sales Department (Dealers Only) 1-800-366-3842
- Technical Services (Dealers Only) 1-800-216-5115
- Warranty Authorization (Dealers Only) 1-888-867-4188
- Retail (Retail Customers Only) 1-800-544-4881

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A person with curly hair, wearing a dark t-shirt and shorts, is standing in a factory or workshop, working on a complex wiring harness. The harness is made of many black cables and connectors, arranged in a structured manner. The background shows industrial equipment and a concrete floor. The lighting is warm and focused on the person and the harness.

THANK YOU.

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