Fridge Defend® by ARP

v5.x ARP & ARP + Fan Control

User Guide

Please click here for Online ARP Video Operation Manual

User Web Search Engine:

Click Here for Web Search before Contacting ARP Control

⚠️ **WARNING**: The operator of the ARP Control is responsible for knowing the status of the control at all times, including the self-test functions. The ARP Control is designed to turn itself on if a power interruption occurs. A power interruption can be as simple as using the RV Master Power Switch to turn off power during storage of the RV. In this situation, when the power is restored to the RV, the ARP Control will turn itself on incase the operator forgets to check the control. The operator must perform the Test of ARP Relay described in this manual before each outing to confirm function of the ARP Control. Also, brown outs and transient on the RV 12VDC supply can turn off the ARP Control, these power interruption are due to many factors which go beyond the scope of this document to describe. Due to brown outs and transients one needs to confirm that the ARP is functioning on a regular basis.

Terms -- Conditions & Contact Information

TABLE of CONTENTS

GRAPHICAL REFERENCE

⚠️Download Detailed Graphical Info: **Ancillary_Graphical_User_Instructions_v4.x.pdf**
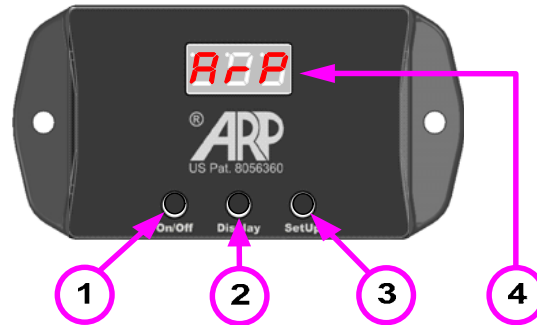
1: ON/OFF BUTTON

General Install Guide
1.6 ARP Control and your Refrigerator

ARP User Guide
BUTTON FUNCTION – **Use this section to understand how to make changes with the buttons.**
1.1 Turn on ARP Control
1.11 Turn off ARP Control
1.12 Restore Factory Control
MODE FUNCTIONS – **The ARP must be turned off to enter any of the startup modes.**
2.1 ARP Control Mode – See 2 & 3 below for other startup modes.

2: DISPLAY BUTTON

ARP User Guide
1.2 View Boiler Temperature
1.3 View Fan Temperature
2.2 No Set-Point Mode

3: SETUP BUTTON

General Install Guide
12.1 Testing ARP Install

ARP User Guide
1.5 Test ARP Relay
1.6 Test Fan Relay
1.7 Automated Test
2.3 Auto Tune Mode – **This mode is very rarely used.**
2.4 Setup Mode

Troubleshooting Guide
SETUP MODE – **Be sure to store new settings before exiting SetUp Mode.**
2.2 Types of SetUp Mode Variables

4: DISPLAY

ARP User Guide
1.8   ARP Protection Period
1.9 If *O*F*8 is Displayed – 5 Time Trigger Event
1.10 If *H*O*8 is Displayed – Excessive Overheat Condition

Troubleshooting Guide
ARP ERROR MESSAGES

INTRODUCTION

To control digital equipment such as cell phones, there is a sequence of button selections and resulting information displayed. The Fridge Defend is no different, thus, as with all digital equipment a user guide is necessary for proper setup and operation.

The following user guide gives a brief graphical description of how to operate the ARP Control. This document shall be considered as a cheat sheet because only a brief description of each function is given. This is not an inclusive operator's manual. The operator of the ARP Control shall understand all information provided in this guide in addition to the **Installation Guide** and the **Troubleshooting Guide**. Please see aforesaid guides for important safety information.

IEC TYPE ACCESSORY SAFETY CONTROL

Dometic and Norcold absorption refrigerators are driven by a fired boiler. It is considered good engineering practice to monitor fired boilers for thermal run away conditions with a safety controller. The patented Fridge Defend is an accessory IEC type safety controller that uses standards, including applicable (and practical) IEC 60730 automatic electrical control checks, combined with functional self-tests to provide an economical, yet functional, safety control.

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FAN CONTROL & NON-FAN CONTROL

This user manual covers two types of control as follows:

ARP v5.0 is the basic version without fan set-point control. The cooling unit boiler protection operates the same as all previous controls.

ARP v5.1 is the same as the basic version with the addition of fan set-point control. This version of control has added function of turning on/off one or more 12VDC fans to help the cooling unit move heat away from the fridge and defrost/circulate air within fridge.

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BUTTON FUNCTION

The following terms are used in the text to indicate how to make changes to the ARP control using the push buttons:

Momentarily Press: This indicates that the operator depresses the button and then immediately releases in order to make a change.

Press and Hold: This indicates that the operator holds the button until a change occurs, once the change takes effect, release the button.
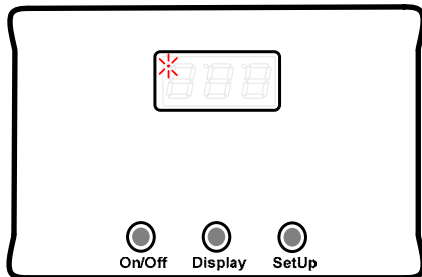
ARP FUNCTION
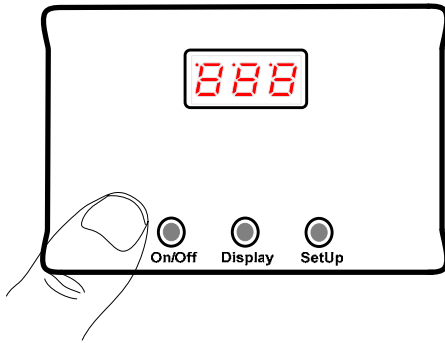
1.1 Turn on ARP Control

Momentarily press the **On/Off** button to start the control in the ARP mode.

A display check is preformed by turning on all segments of the LED. Following the display will show *ArP* for 3 seconds. If there are any errors detected during startup, these errors will be displayed at this time. If no errors are displayed, the control immediately enters the ARP mode.

Note: Every time the ARP has 12VDC applied to the red wire, the control will turn on.
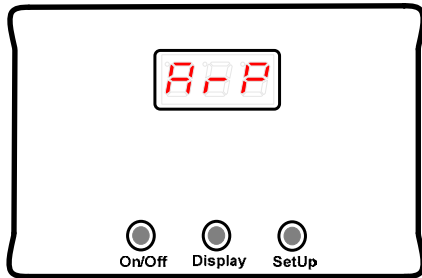
In ARP mode, fan control is active for the v5.1 control. The ARP control will turn on/off the fan when the fan temperature sensor reaches the fan set-point. Please see the **Troubleshooting Guide, Ancillary Graphical**, or online Video Operation Manual to change fan control temperature.

If the left dot flashes on startup, you have a control that is made previous to the v4.*x*, this guide does not apply. If an error was detected that prevents the ARP from functioning, an error message will be displayed.

Please see **Troubleshooting Guide** for expiation of displayed errors.
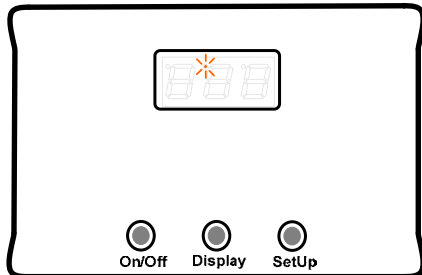
If no errors are detected during startup, the center dot will flash every 4 seconds on the v5.*x* and newer. The center dot must be flashing when in the ARP control mode for the controller to protect your refrigerator. It is a good idea to check to make sure the center dot is flashing to insure protection.
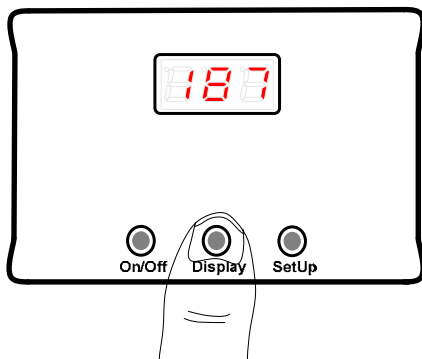
1.2 View Boiler Temperature

Press and hold the center **Display** button till the present boiler temperature is displayed and then release the button. This may take 2 seconds. The boiler temperature will display every other second till you press and hold the **Display** button again. If you have the v5.0 control, jump ahead to section **1.4**. For the v5.1 control, see next section.
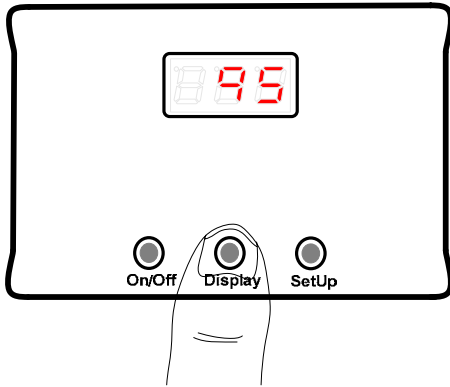
1.3 View Fan Temperature

If the control is a v5.1 control, after viewing the boiler temperature, press and hold the center **Display** button to view the fan sensor temperature.

The fan temperature is only displayed in °F. The fan sensor temperature will display every other second.

Press and hold the center **Display** button again to read the fridge voltage.

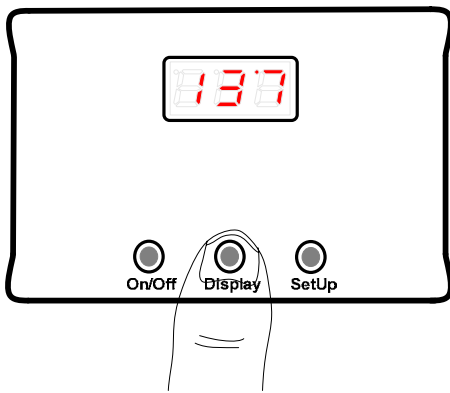The fan sensor measures in the range of 35°F & 155°F. The display will show *OR* (Out of Range) if not within the above temperature range. See **Troubleshooting Guide** for fan *on/off temperature settings*.

1.4 View Fridge Voltage

The voltage on the yellow ARP wire is displayed. This example shows 13.7 volts supplied to the fridge by the ARP. The fridge voltage is an extremely useful troubleshooting parameter. Please see the Troubleshooting Guide for more info using this parameter.

Press and hold the center Display button again, the display will return to flashing the center dot.
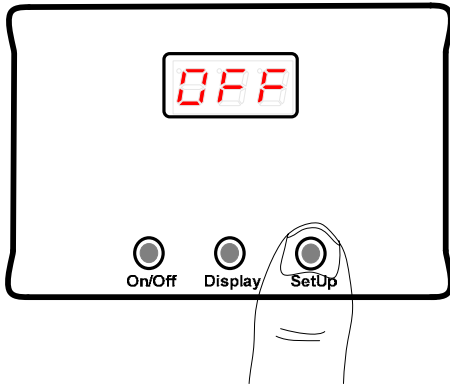
1.5 Test ARP Relay

The next 3 modes of operation will override all ARP functions. Make sure to return the ARP Control to the desired mode of operation when tests are completed.

Press and hold the **SetUp** button to test the ARP relay. Your fridge must shut off during this test. The display will flash *OFF* every other second until the **SetUp** button is held down again to go to the next test.

This test should be preformed in both the gas and electric modes to confirm that the ARP will turn off the refrigerator for protection.
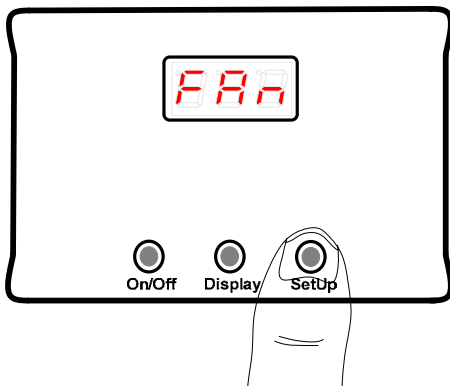
1.6 Test Fan Relay

Hold the **SetUp** button again to test the fan relay if you have a v5.1 control. Your fan should turn on; also your fridge will be turned back on from the previous test. The display will flash *FAn* every other second.

Hold the **SetUp** button again to turn off the fan and proceed to the automated control function test.
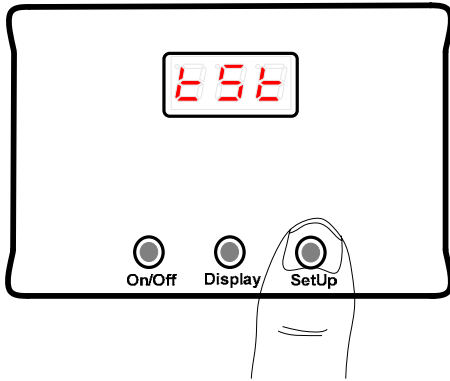
1.7 Controller Function Test

This is an automated test, when *tSt* is displayed the test is being preformed. To meet IEC Design standards, the v5.1 control has an alarm that alerts the operator that there is a critical system failure, the alarm will sound during this test (v5.0 omits this function for economy). The operator must hear the audible alarm during this test for the v5.1. When the test finishes, one of two events will occur:

If the test passes, *PAS* will display, use the **SetUp** button to exit the test. The center dot will resume flashing to indicate that the control is returned to the ARP Control mode.

If either the *F4* or *F5* error message is displayed, contact ARP & discontinue use of controller.
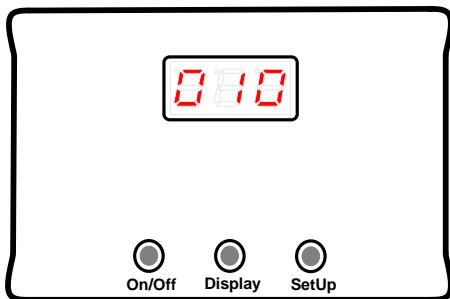
1.8 ARP Protection Period (*What are the numbers on the display*?)

When the ARP Control detects an overheat situation, the control turns off the refrigerator and starts a countdown period. The countdown period is the time until the ARP attempts a **safe restart** of the refrigerator.

⚠ WARNING: Please **do not turn off** the ARP Control during this protection period. Allow the Fridge Defend to do its job, otherwise damage may occur.
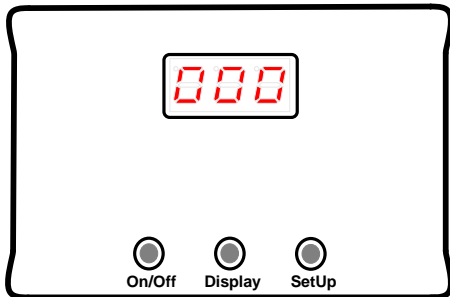
One of three events will occur at the end of the countdown period:

1) If the boiler has cooled enough, the control will restart the refrigerator & center dot will resume flashing.

2) If the temperature is still too high to restart the fridge, *000* will flash until it is safe to restart the fridge.

1.9 Rapidly Flashing *O*F*8

If the control turns off the refrigerator 5 times in a row, the ARP will turn off the refrigerator and rapidly flash *O*F*8 until the operator resets the control by turning off the ARP. For the v5.1 control, an audible alarm will sound alerting the operator that the fridge has an error. Please consult an RV repair facility to restart your fridge if this event occurs. Please see next 2 sections and **Troubleshooting Guide** for further details.

1.10 Excessive Overheat Condition *H*O*8

If the control turns off the refrigerator 5 times in a row, and your boiler temperature has reached 250°C (482°F), the ARP will turn off the refrigerator and rapidly flash *H*O*8 until the operator resets the control by turning off the ARP. For the v5.1 control, an audible alarm will sound alerting the operator that the fridge has an error. Please consult an RV repair facility to restart your fridge if this event occurs. Please see next section and **Troubleshooting Guide** for further details.
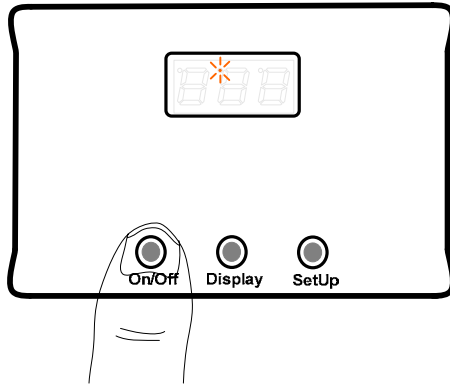
1.11 Turn off ARP Control

The ARP Control can be turned off by pressing and holding the **On/Off** button. The display will show the following characters in sequence.

0 ▶ 0F ▶ OFF

After *OFF* is displayed, and the display goes blank, the ARP Control is turned off. The process takes about 3 seconds.

⚠️ DANGER: This action returns the control of the fridge to the factory safety devices. This action effectively bypasses or removes the Fridge Defend safety control for troubleshooting and testing of the fridge.
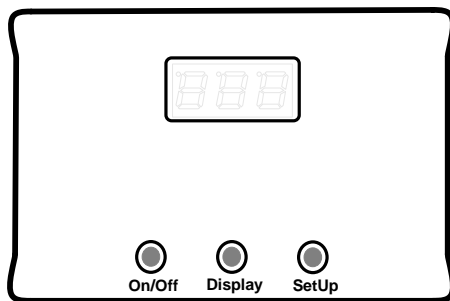
1.12 Restore Factory Control

When the ARP Control is turned off, there is no information on the display, and your fridge functions as it came from the factory.

This feature was implemented due to customer request. The operator of the ARP has full discretion to control their fridge. Seek professional help from a qualified RV repair person if in doubt.

MODE FUNCTIONS

The ARP Control has 3 modes of operation that are initiated upon startup of the control. Restated, turn off the ARP Control (see **1.10**) before attempting to enter into different startup mode functions. The following discussion assumes the **control has been turned off**, and the operator has waited 4 seconds before restarting the control in the desired mode.

2.1 ARP Control Mode

Activation of the ARP Control mode is described above, see 1.1 Turn on ARP Control.
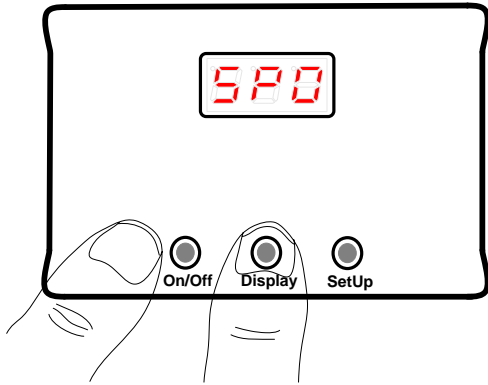
2.2 No Set-Point Mode

Press and hold the center Display button while momentarily pressing the **On/Off** button. Wait until *SP0* is displayed to release the **Display** button. The left and center dot will flash to tell the operator that the control is in the *SP0* mode.

This mode is for diagnostics only, the ARP Control will not turn off the fridge if the boiler over heats when in the *SP0* startup mode. This mode is for *advanced users only*! Please see the **Troubleshooting Guide** for further information.
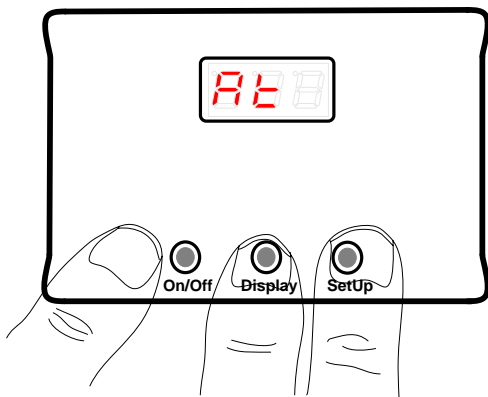
2.3 Auto Tune Mode

Auto Tune is only necessary if the standard 3 ARP Control settings do not work. 98% of fridges will work with the standard settings: C-H, PID, C-L control modes. *Please read the Auto Tune section of the Troubleshooting Guide before running Auto Tune!*

To start Auto Tune, hold down both the right **SetUp** and the center **Display** buttons. Then momentarily press the **On/Off** button. Wait until *At* is displayed to release the **Display** and **SetUp** buttons.
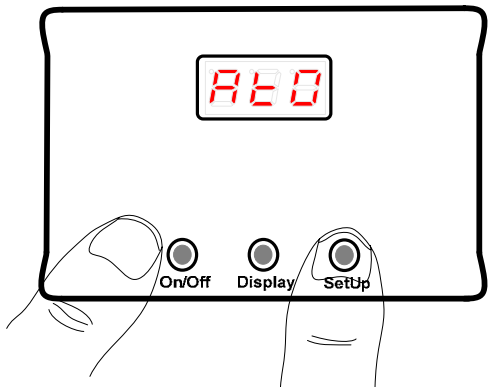
2.4 SetUp Mode

Hold down the right **SetUp** button and then momentarily press the **On/Off** button, when *AtO* displays, release the **SetUp** button.

AtO and its value will alternatively display.

Please see both the **Troubleshooting Guide** & **Ancillary Graphical User Instructions** for further information concerning the Setup Mode functions and adjustment for both ARP and the optional fan control.

CONCLUSION

The ARP Control will protect your fridge by limiting the boiler temperature. The control has a number of functions that allow the operator to test the operation of the control. Please see the **Installation Guide**, **Troubleshooting Guide,** & **Ancillary Graphical User Instructions** for further information on how to install and setup the control if the default programming does not work for your installation. Further modes of operation are defined in the aforesaid documents. Please check for updated documents online.

This manual has been provided courtesy of My RV Works, Inc.

www.myrvworks.com

You can find more RV service manuals here:

www.myrvworks.com/manuals

Over the years of running a mobile RV repair service, having a dedicated place to access service manuals for all the different appliances and components found on RVs was something that I always had a desire to create.

I hope this resource makes your RV repairs easier, as it has mine, but please be careful and follow proper safety practices when attempting to repair your own RV.

If in doubt, please consult with a professional RV technician!

DARREN KOEPP - OWNER, MY RV WORKS, INC.