



Fridge Defend® by ARP


v5.x ARP & ARP + Fan Control

Ancillary Graphical User Instructions

[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 in case 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 transients on the RV 12VDC supply can turn off the ARP Control, these power interruptions 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.

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By use of this document for installation and operation of the ARP Control (Fridge Defend®), the user is agreeing to the ARPC L.L.C. terms and conditions found in document [ARPC LLC License Agreement.pdf](#). Also, the end user needs to understand that the ARP Control can be turned off at any time, thereby removing the ARP Control function and reverting to the operation of the refrigerator to its previous state. Also, the self-test functions which make the Fridge Defend an accessory safety control may be turned off by the end user; this will defeat the 24 hour self-test. Power surges can turn off the ARP Control just the same as any equipment in an RV, thus it is the operators responsibility to insure that the control is functioning properly. Any ARP Control that is believed to be malfunctioning, the ARP Control must be removed from operation and returned to ARPC L.L.C. for inspection immediately. Contact ARPC L.L.C. for shipping instructions. The reason for return must be included in writing with the returned control; shipping is the responsibility of the end user to and from ARPC L.L.C..

The document "ARPC LLC License Agreement.pdf" can be downloaded at web address

<http://www.ARPrv.com>

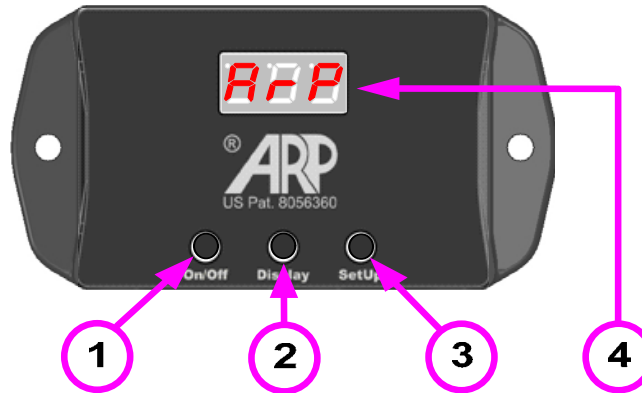
or, please send any request to e-mail address below, ARPC L.L.C. will supply information in a timely manner:

ARPrvSafe@gmail.com

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GRAPHICAL REFERENCE



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

This Graphical Operation manual is **ancillary** to the 3 required ARP Control Manuals consisting of the **Installation, User, and Troubleshooting Guides**.

The following Graphical User Instructions are yet another way to perform the same tasks outlined in both the **Troubleshooting Manual** and the online **Video User Manual**. Rather than using words and brief videos that describe each step, this set of User Instructions will graphically show each button push and the resulting display on the screen with a brief description and a reference to the respective ARP manuals which give further information about the function described. One must read and understand the aforesaid manuals.

BUTTON FUNCTION

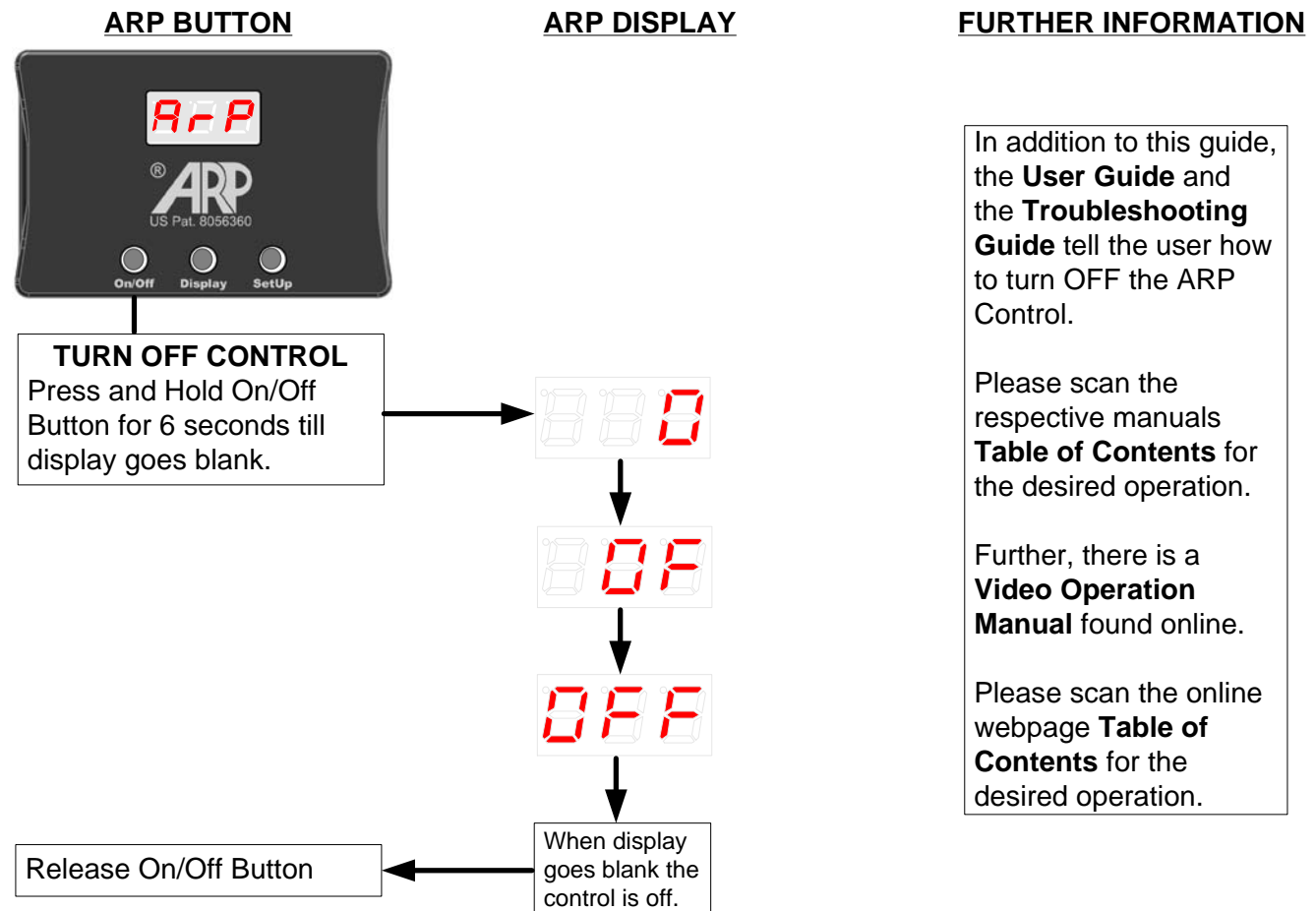
The following terms are used in the text to indicate how to make changes to the ARP Control using the push buttons:

Momentary 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.

ON/OFF BUTTON – Turn On/Off ARP Control

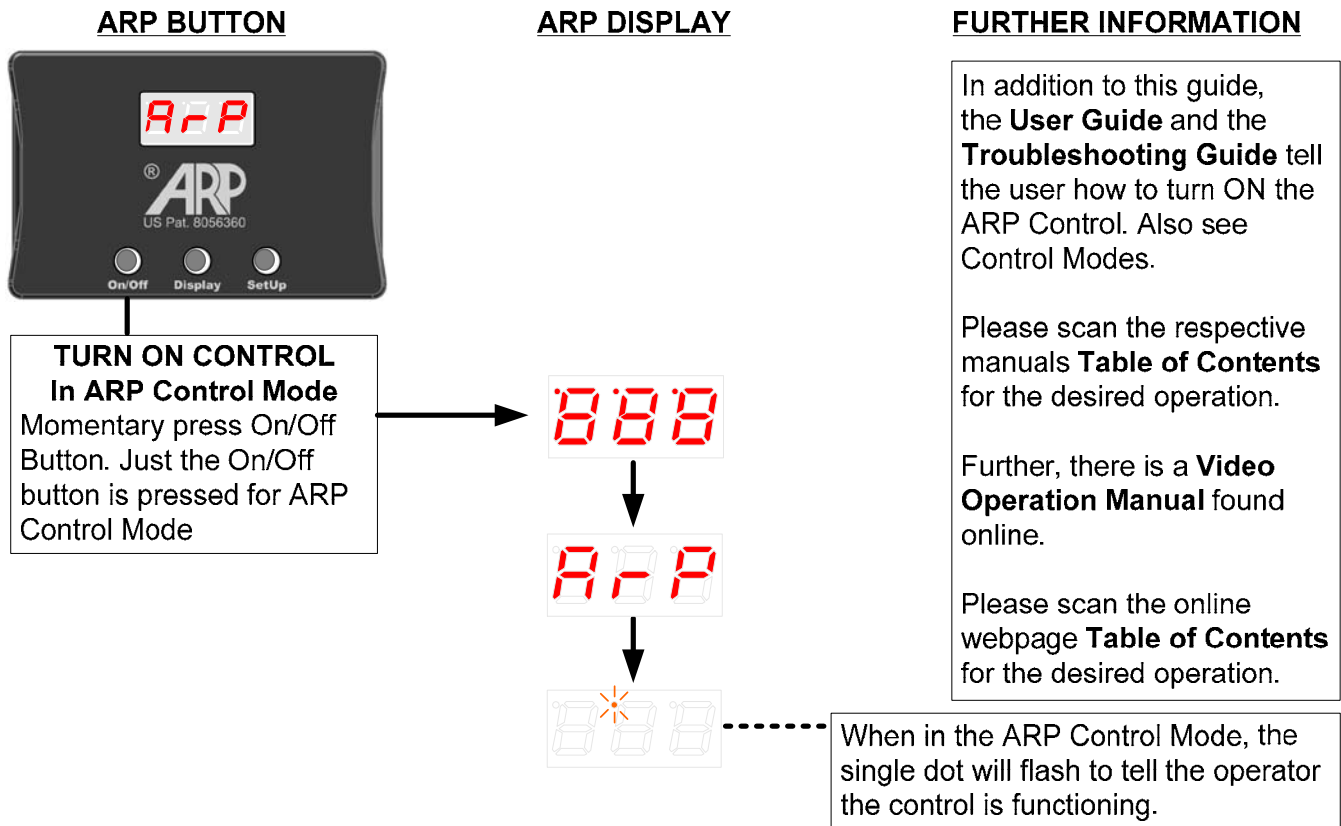
Turn OFF ARP Control in All Modes



Important Information for Setting Control Modes

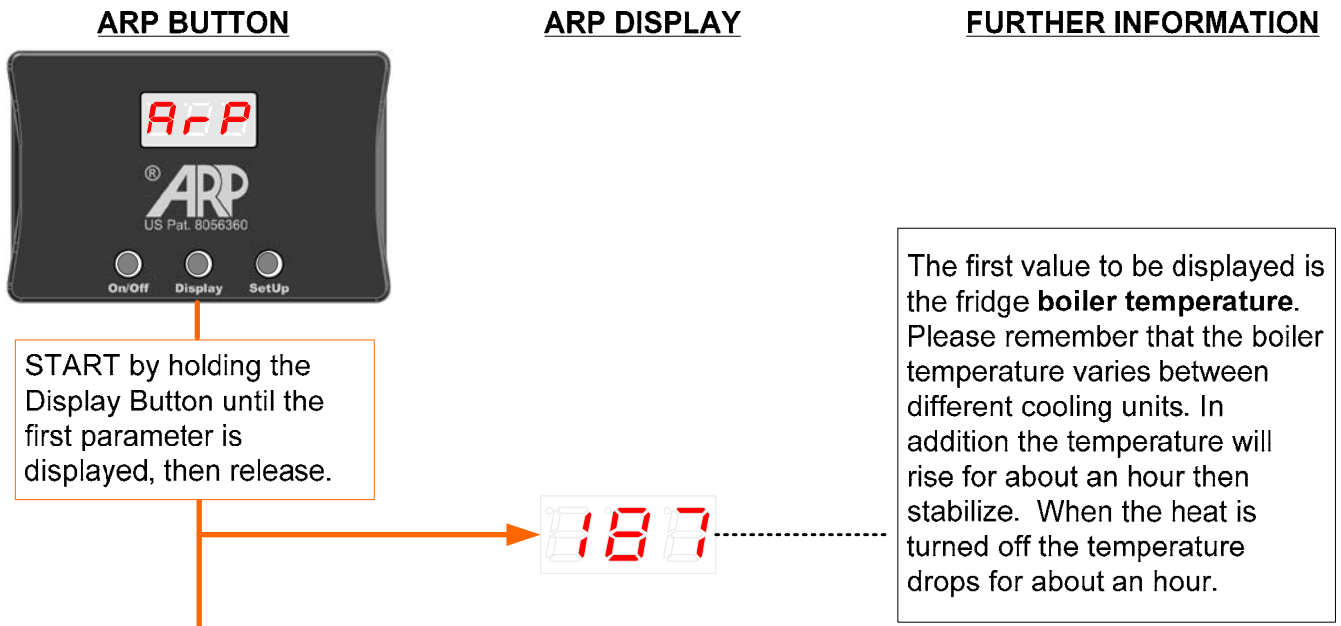
All control modes are entered by **turning off** the ARP Control first. To restate, use the above flow chart to turn off the ARP Control before attempting to enter one of the control modes. Next, use the following flow charts to restart the control in the desired ARP Control modes.

Turn ON Control in ARP Control Mode



ARP or SP0 Mode Display Button Function

Once in the ARP Control mode the Display button reads the refrigerator parameters.



ARP BUTTON

ARP DISPLAY

FURTHER INFORMATION

Press & Hold Display Button until next parameter is displayed, then release.



If the ARP is a fan control version, the next value to be displayed is the **fan sensor temperature**. If the sensor is below 35 F or above 155 F the display will read **OA** for out of range.

Press & Hold Display Button until next parameter is displayed, then release.



The last value displayed with the Display button is the **fridge voltage**. The reading shown is 13.7 volts. The fridge will not run if there is less than 10.5 volts.

Press & Hold Display Button until the display returns to the flashing dot for ARP mode. We recommend leaving the display turned off if not in use.

If controller is in the SP0 mode, proceed to next functions.



When in SP0 troubleshooting mode this value checks the internal function of the controller.

Press & Hold Display Button until next parameter is displayed, then release.



This is the voltage MIN/MAX. Use this function to check the highest and lowest voltages on the system. The example shows typical system voltage with a solar charger cycling on and off. This is very handy for determining AC ripple on the electrical system.

Press & Hold Display Button until the display returns to the flashing dot when in SP0 mode.

The display will toggle between the MAX (14.5) and MIN (13.7) voltage recorded while display is in this function.

ADD USER NOTES HERE:

ARP or SP0 Mode SetUp Button Function

Once in the ARP Control mode the SetUp button tests the control function and installation.

ARP BUTTON

ARP DISPLAY

FURTHER INFORMATION



START by holding the SetUp Button until the first test is displayed.



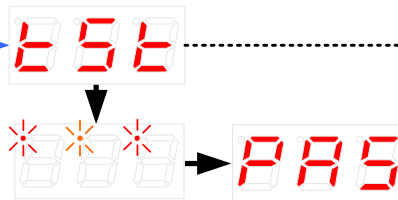
! IMPORTANT TEST
 The first test checks the ARP installation and thereafter tests the controls ability to turn off the fridge. When **OFF** is displayed, go into the RV and check to make sure the fridge turns off. If **E10** displays, the ARP or the fridge is not wired correctly.

Hold down the SetUp Button until the next test is displayed.



This test checks the fans and wiring. When **FAn** is displayed the fans should turn on. The fans will turn off once test is ended.

Hold down the SetUp Button until the next test is displayed.



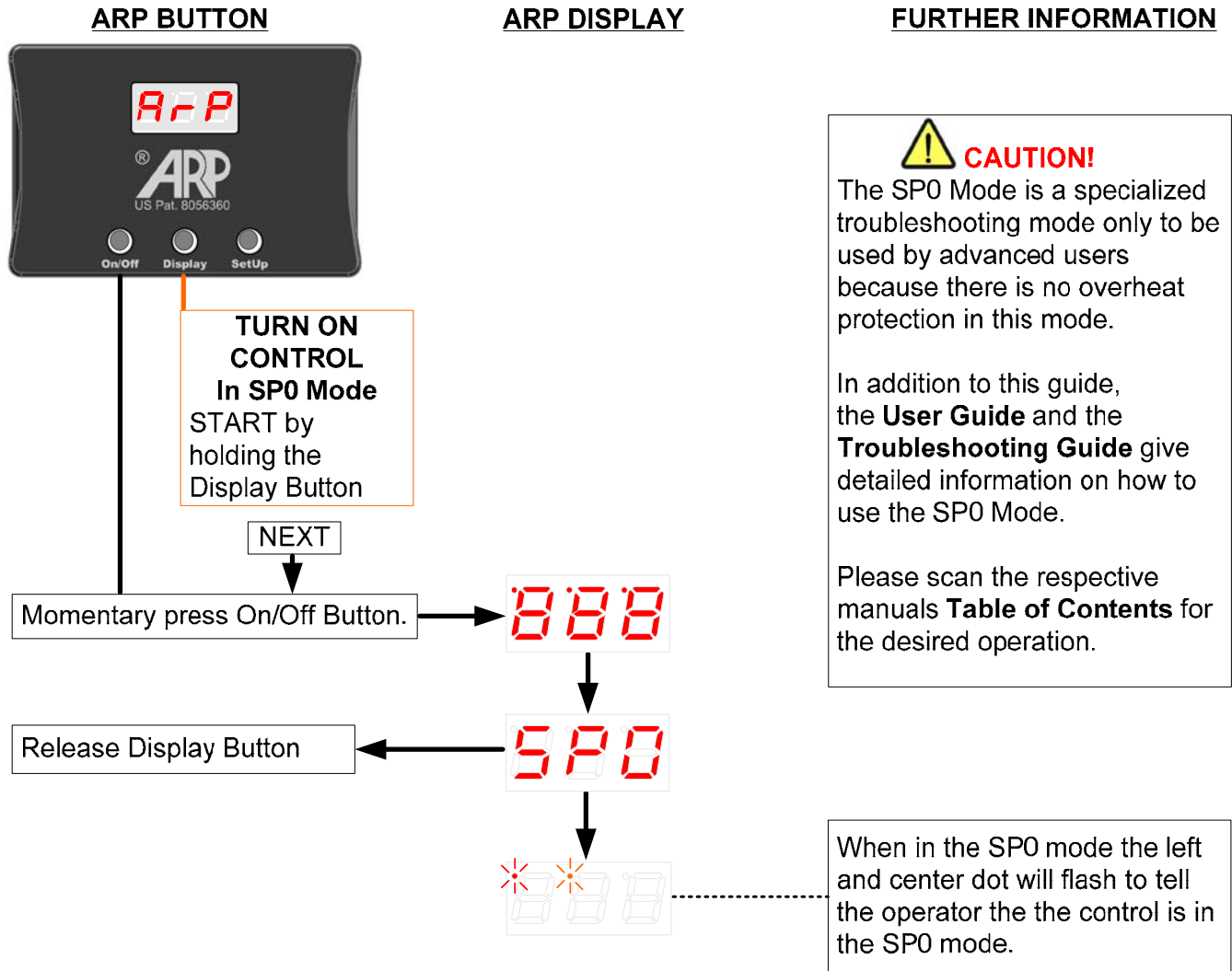
This test checks the controller function and is automatic. When **tSt** followed by ******* is displayed the test is being preformed (* See User Note). When the test passes **PAS** is displayed. If **F4** or **F5** are displayed the test failed, contact ARP and provide the error that is displayed.

! WARNING: Hold down the SetUp Button to exit the tests. There is no overheat protection when the tests are being preformed.
Must see flashing dot on display for protection.

* **USER NOTE:** The v5.0 control is made for economy and therefore does not have an audible alarm. For the v5.1, there is an audible alarm that informs the operator of conditions that require operator intervention. During this test, the v5.1 tests the audible alarm, because this test requires a person to hear the alarm, this is the only test of the audible alarm system. See Troubleshooting Guide for further information.

Turn ON Control in SP0 Mode

Before the **SP0** mode can be started, the ARP Control must be turned off, see section above titled **ON/OFF BUTTON – Turn On/Off ARP Control.**



SP0 Mode Troubleshooting Button Function

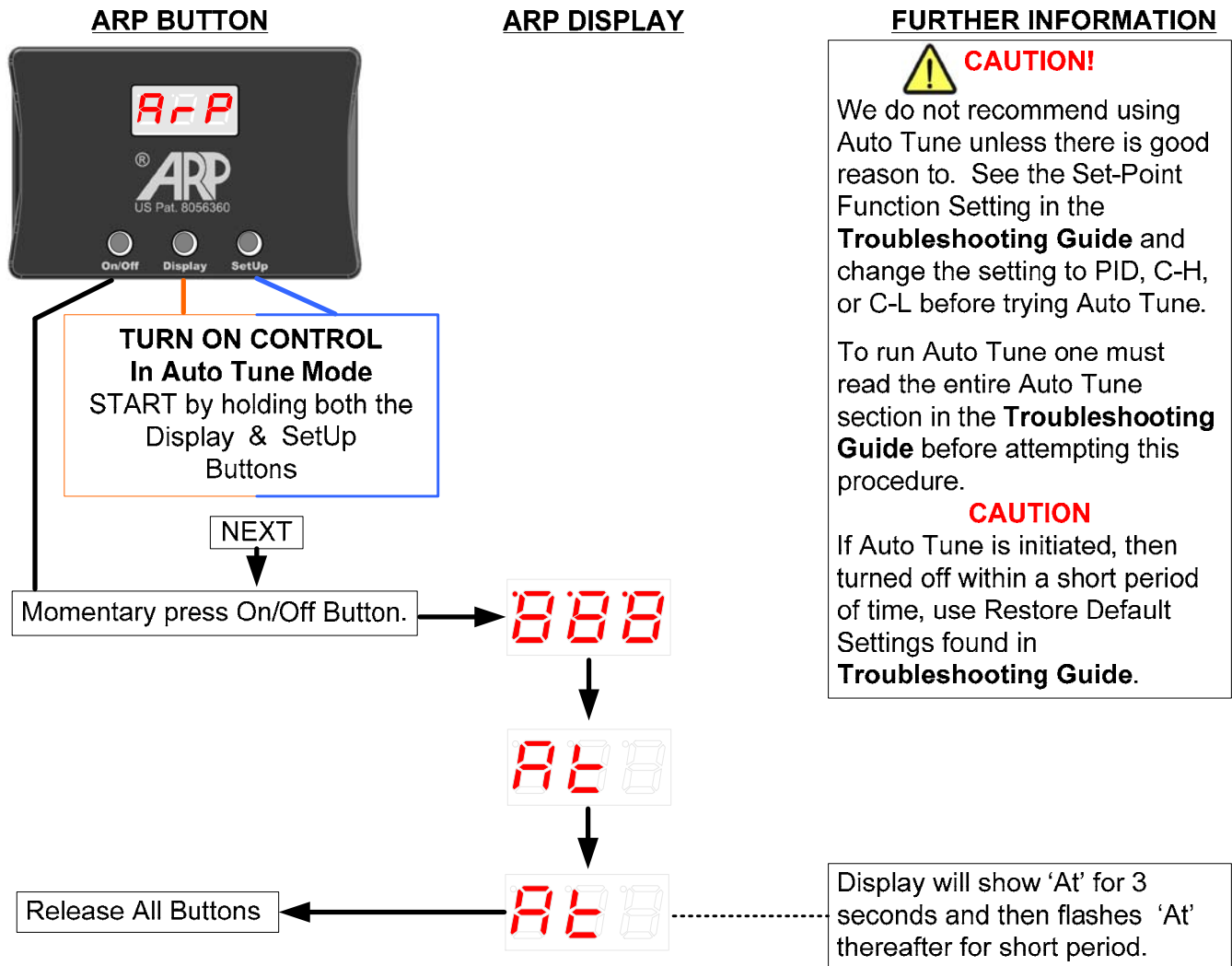
Display Button: The Display button has added function for troubleshooting, see the [ARP/SP0 Mode Display Button Function](#) section for more information on troubleshooting with SP0 functions.

SetUp Button: The SetUp button has the same functions in the SP0 mode that are available in the ARP Control mode.

ADD USER NOTES HERE:

Turn ON Control in Auto Tune Mode

Before the **Auto Tune** mode can be started, the ARP Control must be turned off, see section above titled **ON/OFF BUTTON – Turn On/Off ARP Control.**

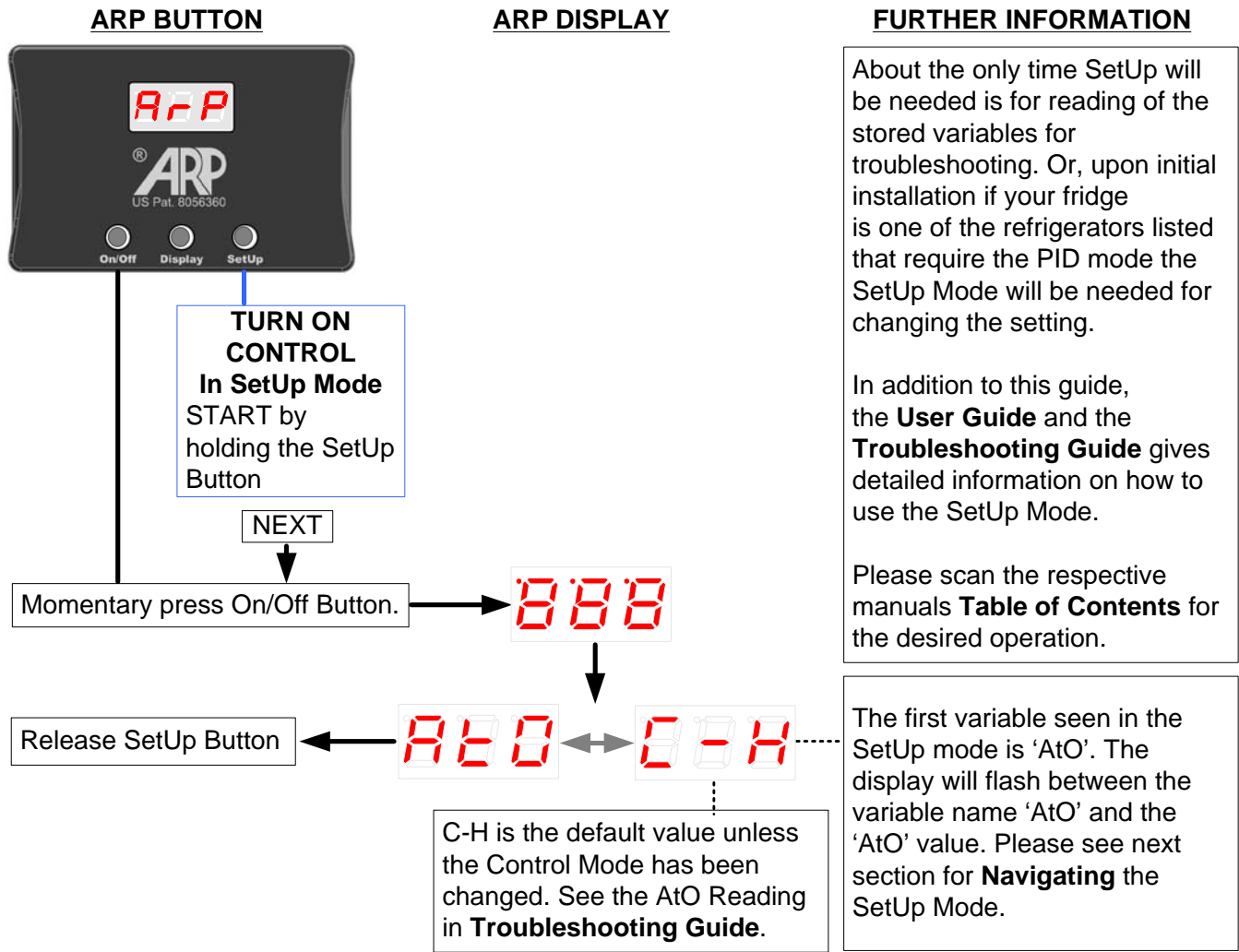


*** USER NOTE:** It is imperative that when in the Auto Tune mode the procedures outlined in the Troubleshooting Guide are followed. It is critical that the Auto Tune be turned off using the On/Off button as described in the **Turn OFF ARP Control in All Modes** section. If these procedures are not followed, incorrect information may be stored within the control, resulting in errors that can lead to safety issues. If in doubt, have a qualified person follow these instructions.

ADD USER NOTES HERE:

Turn ON Control in SetUp Mode

Before the **SetUp** mode can be started, the ARP Control must be turned off, see section above titled **ON/OFF BUTTON – Turn On/Off ARP Control.**



☺ Before Contacting ARP for Assistance

Please record the first 7 values identified with the '☺' symbol found in the SetUp Mode below before contacting ARP for help with any troubleshooting needs:

1. **AtO:** Tells operator or diagnostician which control mode.
2. **AtS:** Gives further info on control mode.
3. **AbS:** Maximum temperature boiler has reached.
4. **tr:** Number of times a trip or boiler overheat has occurred.
5. **OPn:** Number of times open circuit is recorded for boiler sensor purple/white wire.
6. **SHt:** Number of times short circuit is recorded for boiler sensor purple/white wire.
7. **SSH:** If the control is in the C-L or C-H mode, this value will be fixed as '**-L0**'. If the control is in the PID mode, this will record the maximum steady-state temperature.

SETUP MODE NAVIGATION

Button Operation

The three buttons on the ARP Control that performs the following functions when in the SetUp mode:

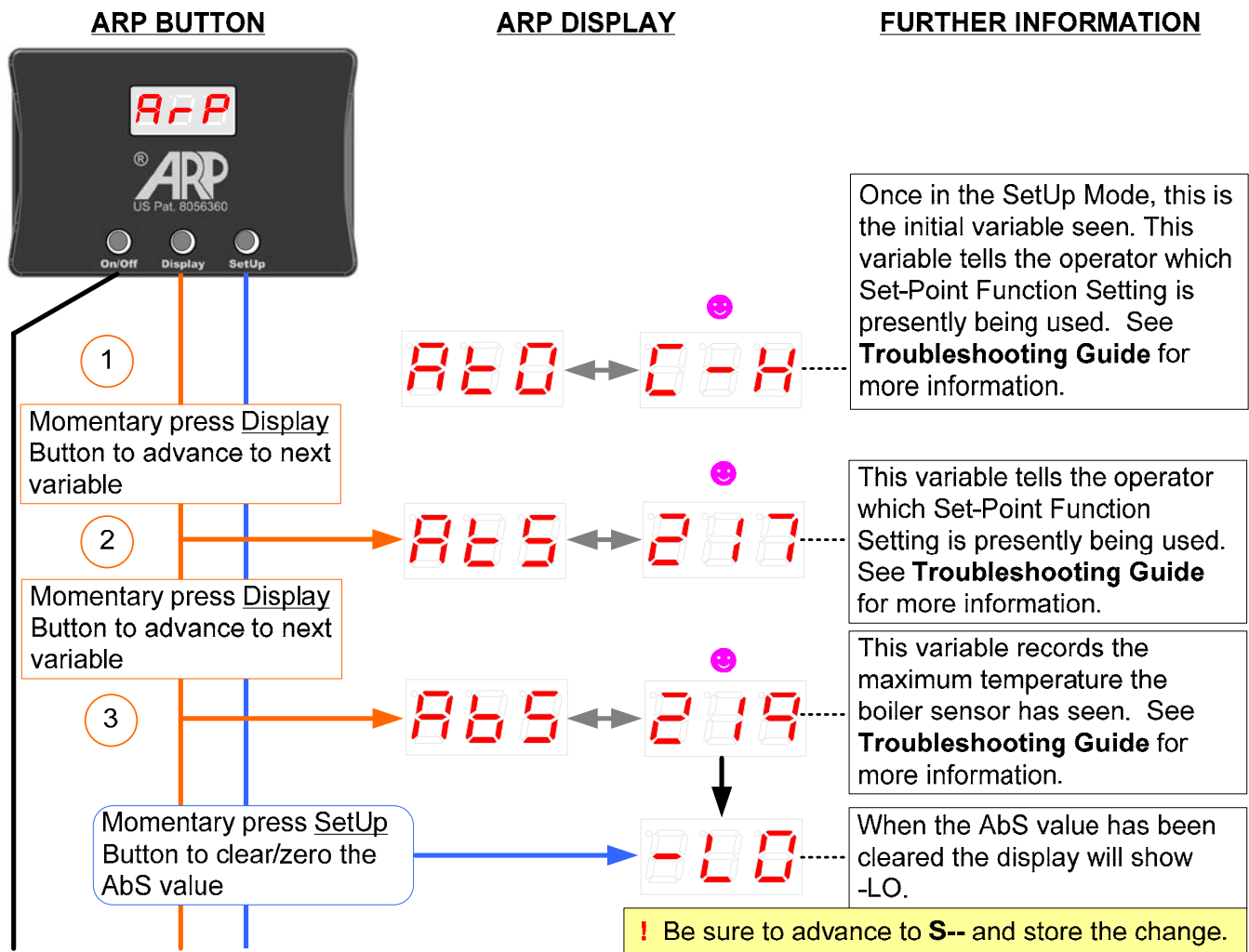
On/Off Button: Turn off the control by pressing and holding until **OFF** is displayed. One may turn off the ARP at anytime in the SetUp Mode without saving any changes.

Display Button: The display button is used to advance to the next SetUp variable. By repeated pushing of the display button the variables will advance to the store function (**S--**), and to the IEC errors recorded (**Er0**). The next press of the display button will rotate back to the first variable **AtO** to start the sequence over.

SetUp Button: The SetUp button will change the value of adjustable variables. Each push of the SetUp button will increment the value by +1 up to the maximum value, and then rotate back to zero depending on the variable.

Navigation Flow Diagram

Note: All initial values seen in this diagram are the default values in the **C-H** mode, your values may be different depending on the control mode or units of temperature display.



ARP BUTTON

ARP DISPLAY

FURTHER INFORMATION

Momentary press Display Button to advance to next variable

4



This variable tells the operator how many times the ARP boiler sensor has detected a boiler over heat situation and shut down the fridge to protect the cooling unit. See **Troubleshooting Guide** for more information.

Momentary press SetUp Button to clear/zero the tr value



Set the tr value to zero and record the date to see when or how often the ARP turns off the fridge.

Momentary press Display Button to advance to next variable

! Be sure to advance to **S--** and store the change.

5



This variable records if the boiler sensor has an open circuit. See **Troubleshooting Guide** for more information.

Momentary press SetUp Button to clear/zero the OPn value



If the ARP Control is tripping often, check this value, if OPn is greater than zero, there is a problem that has to be fixed.

Momentary press Display Button to advance to next variable

! Be sure to advance to **S--** and store the change.

6



This variable records if the boiler sensor has a short circuit. See **Troubleshooting Guide** for more information.

Momentary press SetUp Button to clear/zero the SHt value



Read comments directly above for the variable OPn, they are true for this variable also.

Momentary press Display Button to advance to next variable

! Be sure to advance to **S--** and store the change.

7



This variable records the boiler steady-state maximum temperature in PID mode. See **Troubleshooting Guide** for more information.

Momentary press SetUp Button to clear/zero the SSH value



When the SSH value has been cleared the display will show -LO.

Momentary press Display Button to advance to next variable

! Be sure to advance to **S--** and store the change.

ARP BUTTON

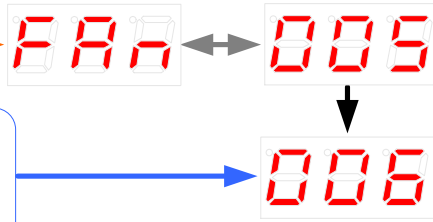
ARP DISPLAY

FURTHER INFORMATION

8

Change setting, each press of SetUp Button increments the value of FAn by one

Momentary press Display Button to advance to next variable



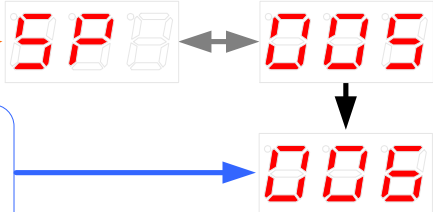
This variable is the setting at which the fan sensor turns on the fan. See **Troubleshooting Guide** for more information.

See table in FAn Setting section of **Troubleshooting Guide** for On/Off fan temperatures.

9

Change setting, each press of SetUp Button increments the value of SP by one

Momentary press Display Button to advance to next variable



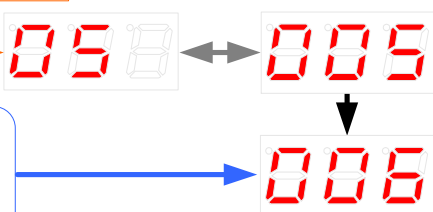
This variable sets the steady-state ARP boiler sensor set-point. See **Troubleshooting Guide** for more information.

This setting rarely needs to be changed

10

Change setting, each press of SetUp Button increments the value of SP by one

Momentary press Display Button to advance to next variable

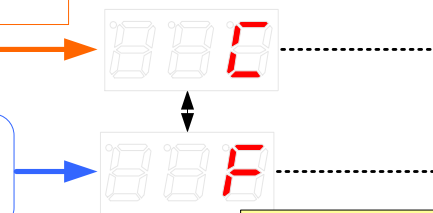


This variable changes the overshoot set-point. This affects the PID function 'AtS' value. Or the C-L function 'AtO' value. Rarely used, see **Troubleshooting Guide** for more info.

11

Momentary press SetUp Button to toggle between C and F

Momentary press Display Button to advance to next variable



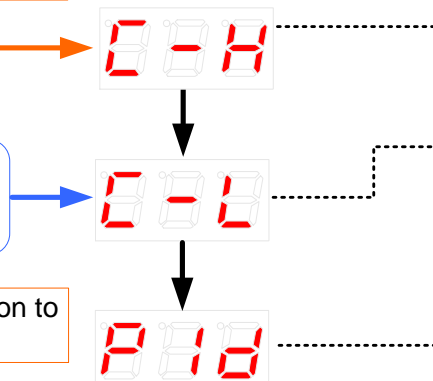
This variable changes the displayed units of temperature for the boiler sensor between Fahrenheit and Celsius.

We recommend using C setting.

12

Momentary press SetUp Button to toggle to each set-point function

Momentary press Display Button to advance to next variable



This variable changes set-point function. C-H works on most fridges. See **Troubleshooting Guide** for more information.

C-L is used for the 3 cubic foot fridge.

PId is for 2013 on 1200/1210 series refrigerators and factory Norcold replacement cooling units, in addition the Norcold 2118 refrigerators. Also, PId is required for the Amish cooling units. See **Troubleshooting Guide** for more information.

! Be sure to store changes with S-- .

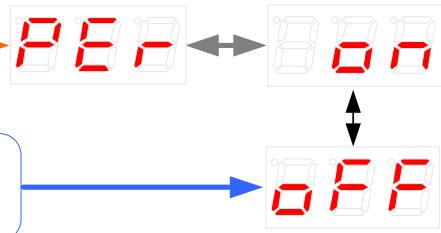
ARP BUTTON

ARP DISPLAY

FURTHER INFORMATION

13

Momentary press **SetUp** Button to toggle setting between on and oFF



When set to **on** the ARP periodic test is performed every 24 hours & the factory defrost cycle is defeated.

When set to **oFF**, the ARP periodic test is not performed and the factory defrost cycle is run as scheduled by the manufacture. See **Troubleshooting Guide** for further information.

! Be sure to store changes with S-- .

Momentary press **Display** Button to advance to next variable

14



This variable shows the version of software.

Momentary press **Display** Button to advance to next variable

15



Snt stands for Serial Number thousands. See below for definition of reading the Serial Number.

Momentary press **Display** Button to advance to next variable

16

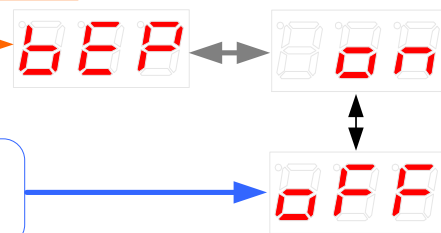


SnH stands for Serial Number hundreds. Example: The Serial Number would be **65,535**.

Momentary press **Display** Button to advance to next variable

17

Momentary press **SetUp** Button to toggle setting between on and oFF



NOTE: Only on v5.1, not available on v5.0. When set to **on** the ARP will sound alarm when certain errors occur.

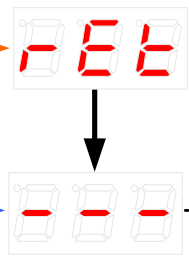
When set to **oFF**, the ARP will not sound alarm if fails IEC type tests. See **Troubleshooting Guide** for more information.

! Be sure to store changes with S-- .

Momentary press **Display** Button to advance to next variable

18

Momentary press **SetUp** Button to reset the factory settings

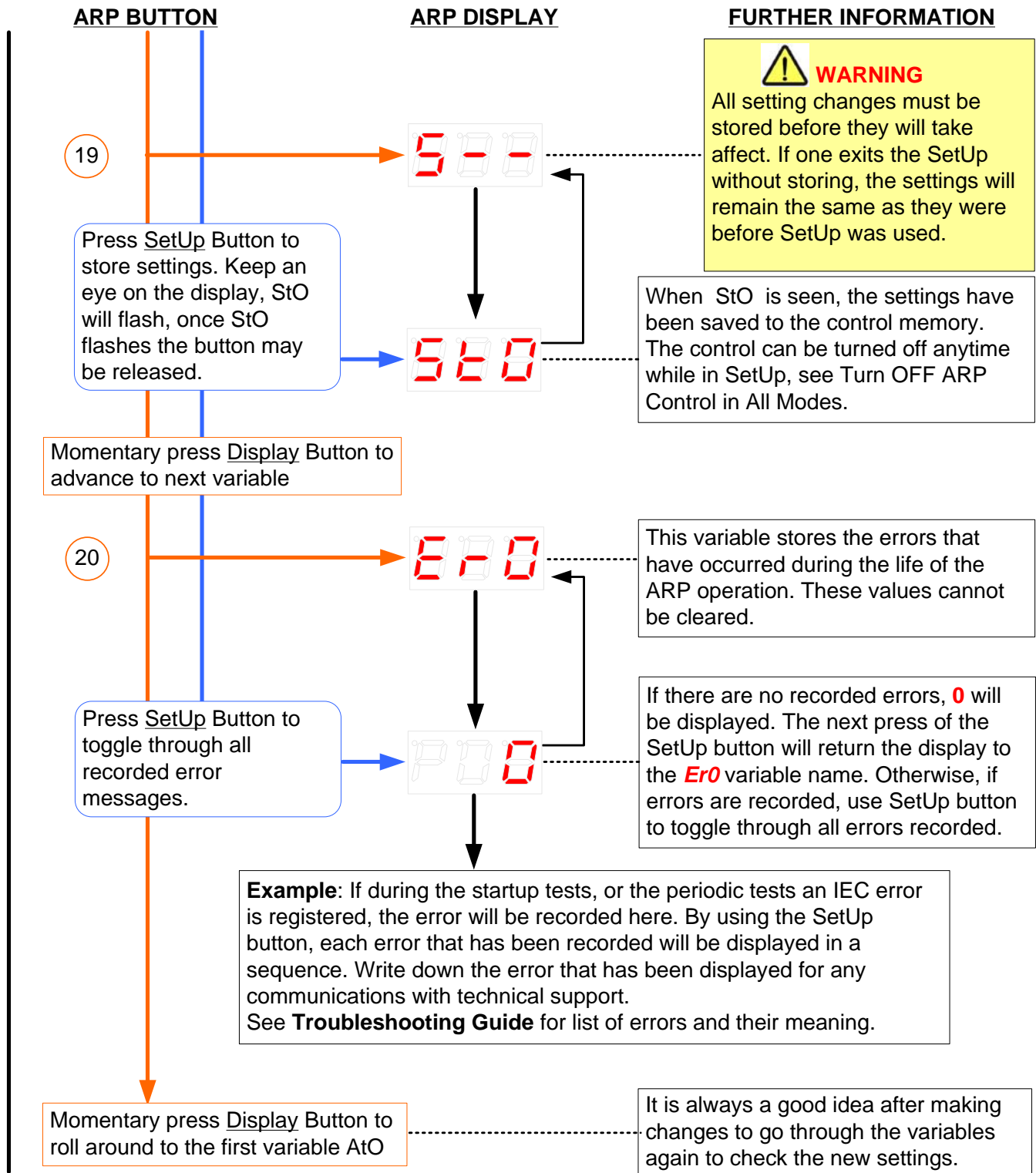


This variable resets the ARP Control to the default settings if Auto Tune was run accidentally. See **Troubleshooting Guide** for more information.

When --- is seen, the settings have been restored.

! Be sure to store changes with S-- .

Momentary press **Display** Button to advance to next variable



ERRORS and/or MISTAKES DURING Setup SESSION

Mistake During Setup Session?

Do you think a mistake was made during the Setup session? **No problem!**

Just turn off the control as described above without performing a save procedure (S--).

Restated, the ARP Control was designed so that if the end user pushed the wrong buttons, no changes occur unless one saves the changes before turning off the control. Therefore, if in doubt, turn off the control and start over without saving changes.

What if I Make a Mistake and Save?

If things are going wrong and one thinks a mistake was stored during a SetUp session? Just use the Restore of Factory Settings (**rEt**) to set a base point to restart the ARP Control just as the control came the day you opened the package.

How Do I Keep Track of Things?

We recommend jotting down **user notes** when changes are made along with the date to keep a journal of refrigerator performance. The ARP Control is a powerful troubleshooting tool; therefore good notes help the end user solve problems. Also, if errors are noted, write down any corrective actions to resolve the issue so that one knows later what they have done. The ARP Control is designed to be setup once and then used, one cannot be expected to remember every setup step years later without notes.

USER NOTES:

DATE | NOTES

This manual has been provided courtesy of
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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.

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