

WA28 2-Channel Refrigerator Thermometer

User Manual

1 Introduction

Thank you for your purchase of the WA28 2-Channel Refrigerator Thermometer. The following user guide provides step by step instructions for installation, operation and troubleshooting.

2 Getting Started



The WA28 Refrigerator Thermometer consists of a display console (receiver), and two thermometers(sensor).

Note: The power up sequence must be performed in the order shown in this section (insert batteries in the remote transmitter(s) first, Display Console second).

2.1 Thermometer Sensor Set Up



Note: To avoid permanent damage, please take note of the battery polarity before inserting the batteries.



Note: Do not use rechargeable batteries. We recommend fresh alkaline batteries for temperature ranges between -20 °C and 60°C

Pull down on the battery door to open the battery compartment, as shown in Figure 1. Insert two fresh AAA batteries (with the negative terminal of the battery in contact with each spring). Slide the top lip of the battery door into the battery compartment guide and snap the bottom battery door bracket into place. The LED shown in Figure 1 will light up (visible through the plastic).

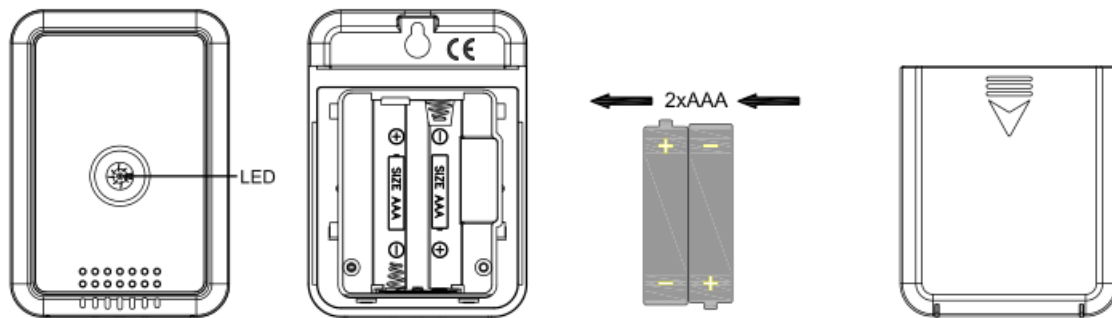


Figure 1

2.2 Display Console Set Up

1. Remove the battery door on the back of the display, as shown in Figure 2. Insert three AAA (alkaline, avoid rechargeable) batteries in the back of the display console.



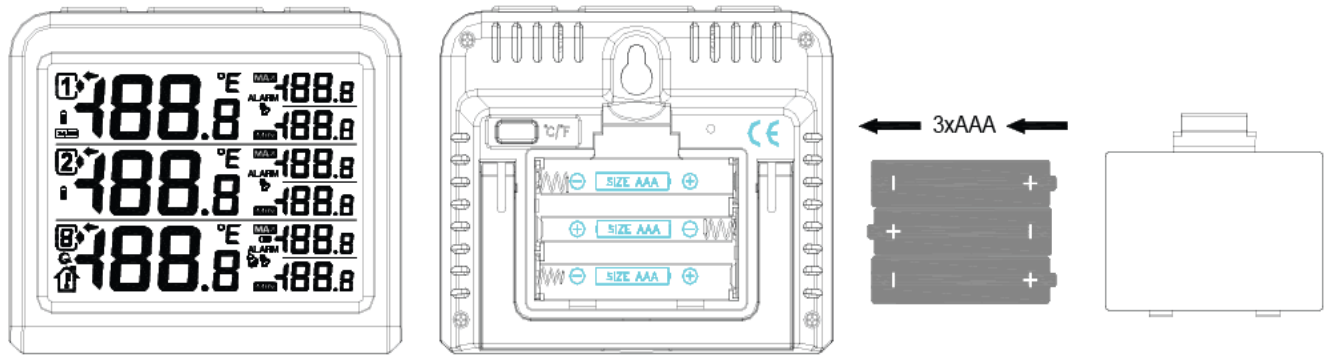


Figure 2

All of the LCD segments will light up for a few seconds to verify all segments are operating properly.

The console will instantly display indoor temperature. The outdoor temperature will display dashes or --., then update on the display within a few minutes.

If of the sensor communication is lost, dashes (--.) will be displayed on the screen. The Remote sensor search icon  will automatically search for the signal.

Once the signal is reacquired, the remote search icon  will turn off, and the current value will be displayed.

Do not touch any buttons until all of the remote sensors has reported in, or the radio search icon  is no longer visible, otherwise the remote sensor search mode will be terminated. When the remote sensor temperature has been received, the console will automatically switch to the normal mode, and all further settings can be performed.

Verify the correct temperature unit of measure ($^{\circ}\text{F}/^{\circ}\text{C}$;) are on the display

2.2.1 Display Console Layout

 **Note:** The following illustration shows the full segment LCD display for description purposes only, and will not appear like this during normal operation.

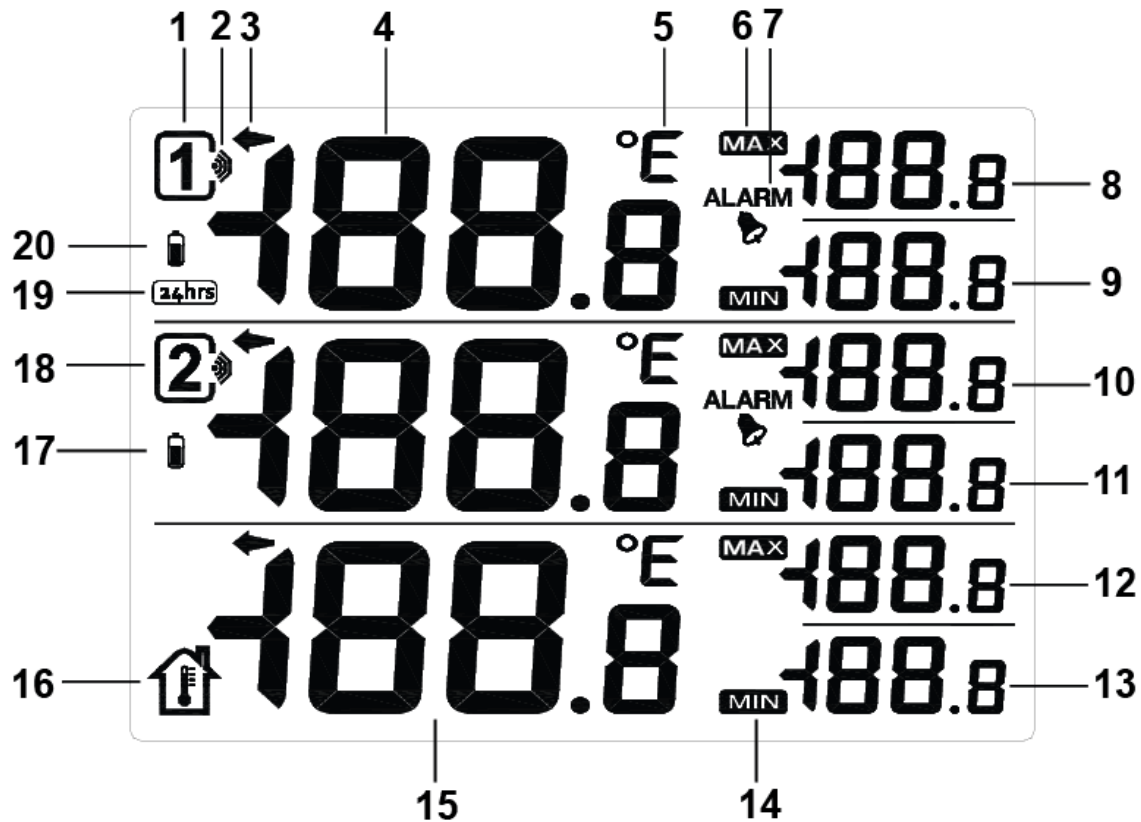


Figure 3

1. Channel 1 Indicator
2. Reception Icon (solid when searching, flashes when updating)
3. Channel Selector
4. Channel 1 Temperature
5. Temperature units (°F or °C)
6. Max Temperature Indicator
7. Temperature Alarm
8. Maximum Temperature, Channel 1
9. Minimum Temperature, Channel 1
10. Maximum Temperature, Channel 2
11. Minimum Temperature, Channel 2
12. Maximum Temperature indoor indicator
13. Minimum Temperature indoor indicator
14. Min Temperature Indicator
15. Indoor thermometer display
16. Indoor Temperature Indicator
17. Low battery indicator
18. Channel 2 Indicator
19. 24H Clears Daily indicator
20. Low battery indicator

2.2.2 Sensor Operation Verification

The sensors should be within 2°C (the accuracy is $\pm 1^\circ\text{C}$). Allow about 10 minutes for both sensors to stabilize. The temperature can be adjusted or calibrated later to match each other or a known source.

3 Remote Sensor Installation

3.1 Wall Mounting

The remote sensors measure inside/outside air temperature .
If you mount one or two of the sensors outside, it is recommended you mount the sensor(s) on a north facing wall, in a shaded area. Direct sunlight and radiant heat sources will result in inaccurate temperature readings. Although the sensors are water resistant, it is best to mount in a well protected area, such as under an eave. Use a screw or nail (not included) to affix the remote sensor to the wall, as shown in **Figure 4**.

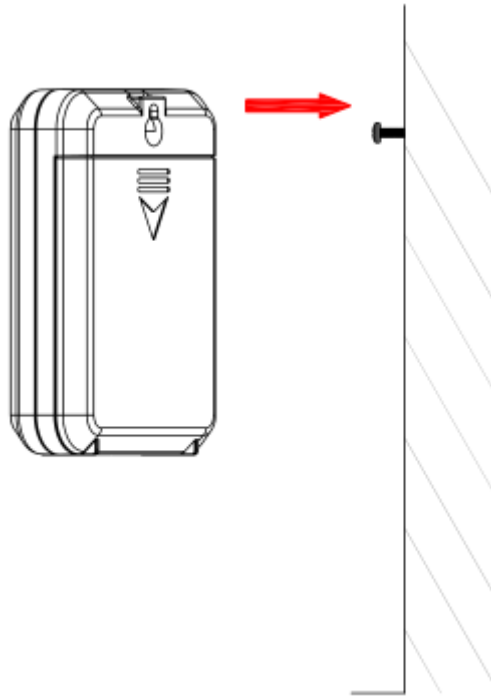


Figure 4

4 Console Operation

 **Note:** The console has five buttons for easy operation: **CH/+** button, **ALARM CLEAR/-** button, **LIGHT** button on the top ,and **C/F** button in the back.

4.1 Quick Display Mode

 **Note:** The default temperature unit is Celsius.

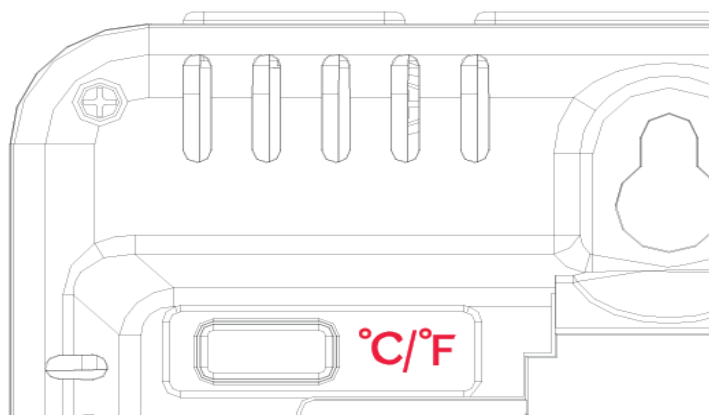


Figure 5

To switch the temperature unit C/F, press the C/F button on the back , as show in Figure 5.

4.2 Channel Selection

Press the CHANNEL/+ button to switch the display between the Channel 1 temperature, Channel 2 temperature, and indoor temperature .

4.3 Min and Max Alarm

You can set a min and max temperature alarm on the Channel 1 and Channel 2 thermometers. If the alarm is exceeded for more than 10 minutes, as audible alert will occur and the alarm value will flash. To silence the alarm, press any button.

To set the alarm, or adjust the min and max alarm settings, press the **CHANNEL/+** button until the channel indication arrow  points at the selected channel.

4.3.1 Turning On and Off the Alarm

With the indicator arrow  pointing at the appropriate channel, press the **ALARM** button to turn on and off the alarm. The alarm icon will appear  when set, and disappear when disabled.

The alarm will sound if the sensor falls bellow or rises above the MIN/MAX limits for more than 10 minutes and the alarm icon  is present. This prevents false alarms from sounding when the refrigerator/freezer door is opened.

4.3.2 Setting the Min and Max Alarm

With the indicator arrow  pointing at the appropriate channel, press and hold the **ALARM** button for 3 seconds and the **MAX** alarm will flash. Press the **CH/+** button to increase the MAX alarm and the **CLEAR/-** button to decrease the MAX alarm. Press and hold the + or - button to change rapidly.

Press the **ALARM** button and the MIN alarm will flash. Press the **CH/+** button to increase the MIN alarm and the **CLEAR/-** button to decrease the MIN alarm. Press and hold the + or - button to change rapidly.

When complete, press the **ALARM** button again, and the display will return to normal mode.

In the alarm mode, 15 seconds without operation will automatically return to normal mode.

4.3.3 Viewing the Min and Max Alarms

With the indicator arrow  pointing at the indoor temperature channel, press the **ALARM** button to view the Channel 1 and Channel 2 alarm limits.

4.4 Reset Max/Min

With the indicator arrow  pointing at the appropriate channel, press the **CLEAR/-** button to restore the MAX and MIN values to the current value.

Normal  to clear daily. Insert battery, automatically cleared for every 24 hours.

In the normal mode, Press and hold the **CLEAR/-** button for 3s to switch between “Clears Daily”( display) and Clears Manually( disappear)

4.5 Sensor Search Mode

If any of the sensor communication is lost, dashes (---) will be displayed on the screen. To reacquire the signal:

1. If a specific channel is lost, press the **CH/+** button until the channel indication arrow  is pointing at the appropriate channel.

Press and hold the **CH/+** button for 3 seconds, and the remote search icon  will be constantly displayed for up to 10 minutes.

Once the signal is reacquired, the remote search icon  will turn off, and the current value will be displayed.

2. If new sensors are added, subtracted, or multiple sensor channels are lost, press the **CHANNEL/+** button until the channel indication arrow  is pointing at the indoor

temperature . Press and hold the **CH/+** button for 3 seconds, and the remote search icon  will be constantly displayed for up to 10 minutes. Once the signal is reacquired, the remote search icon  will turn off, and the current value will be displayed.

4.6 Backlight Mode

In the normal mode, Press the LIGHT key in normal mode, the backlight will light up for 10 seconds. If there are not other key operations during the time delay, it will be turned off after 10 seconds.

 Note: It is not recommended leaving the backlight on for a long period of time ,or the batteries will run down quickly.



4.7 Best Practices for Wireless Communication

Wireless communication is susceptible to interference, distance, walls and metal barriers. We recommend the following best practices for trouble free wireless communication.

1. **Electro-Magnetic Interference (EMI).** Keep the console several feet away from computer monitors and TVs.
2. **Radio Frequency Interference (RFI).** If you have other 433 MHz devices and communication is intermittent, try turning off these other devices for troubleshooting purposes. You may need to relocate the transmitters or receivers to avoid intermittent communication.
3. **Line of Sight Rating.** This device is rated at 100 meters line of sight (no interference, barriers or walls) but typically you will get 30 meters maximum under most real-world installations, which include passing through barriers or walls.
4. **Metal Barriers.** Radio frequency will not pass through metal barriers such as aluminum siding. If you have metal siding, align the remote and console through a window to get a clear line of sight.

5. Low Battery Icon

A low battery indicator icon is shown in the display window for each sensor. When the low battery icon appears (the battery voltage is lower than 2.4V), replace the batteries in the sensor with fresh batteries. Be sure to never mix old and new batteries, and never mix battery types such as alkaline and lithium together.

6 Specifications

6.1 Wireless Specifications

- Line of sight wireless transmission (in open air): 100 meters, 30 meters under most conditions.
- Frequency: 433 MHz
- Update Rate: 60 seconds

6.2 Measurement Specifications

The following table provides specifications for the measured parameters.

Measurement	Range	Accuracy	Resolution
Indoor Temperature	0 to 60 °C	± 1 °C/±2.5°F	0.1 °C
Channel 1-2 Temperature	-40 to 60 °C	± 1 °C/±2.5°F	0.1 °C

6.3 Power Consumption

- Base station (display console) : 3 x AAA 1.5V Alkaline or Lithium batteries (not included)
- Remote sensor : 2 x AAA 1.5V Alkaline or Lithium batteries (not included)
- Battery life: Minimum 6 months for base station with one sensor and excellent reception. Intermittent reception and multiple sensors may reduce the battery life.
Minimum 6 months for thermometer probe sensor



7 Troubleshooting Guide

Problem	Solution
Wireless remote thermometer not reporting in to console. There are dashes (---) on the display console.	If any of the sensor communication is lost, dashes (---) will be displayed on the screen. To reacquire the signal, press and hold the CH/+ button for 3 seconds, and the remote search icon  will be constantly displayed. Once the signal is reacquired, the remote search icon  will turn off, and the current values will be displayed. The maximum line of sight communication range is 100 meters and 30 meters under most conditions. Move the sensor assembly closer to the display console. Make sure the remote sensor LCD display is working and the transmitter light is flashing once per 60 seconds. Install a fresh set of batteries in the remote thermometer. For cold weather environments, install lithium batteries. Make sure the remote sensors are not transmitting through solid metal (acts as an RF shield), or earth barrier (down a hill). Move the display console around electrical noise generating devices, such as computers, TVs and other wireless transmitters or receivers. Move the remote sensor to a higher location. Move the remote sensor to a closer location.
Temperature sensor reads too high in the day time.	Make sure the remote thermometer is mounted in a shaded area on the north facing wall.
Indoor and Outdoor Temperature do not agree	Allow up to one hour for the sensors to stabilize due to signal filtering. The indoor and outdoor temperature sensors should agree within 2 °C (the sensor accuracy is $\pm 1\text{ }^{\circ}\text{C}/\pm 2.5^{\circ}\text{F}$). Use the calibration feature to match the indoor and outdoor temperature to a known source.
Display console contrast is weak	Replace console batteries with a fresh set of batteries.

