

*Robertshaw®*

# RS9210

Installation Manual



Thank you for purchasing a Robertshaw® thermostat. This manual will describe how to install and test the Robertshaw **RS9210** thermostat.

## Thermostat System Types

|                                                          |
|----------------------------------------------------------|
| Gas, Oil, or Electric Heat with Air Conditioning         |
| Heat Pumps (with or without auxiliary or emergency heat) |
| Multi-Stage Systems                                      |
| Heat-Only, including for Floor and Wall-Furnace          |
| Cool-Only                                                |
| 750 Millivolt Heating Systems                            |

## Power Options

Battery Power

Hardwire (Common Wire)

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## IMPORTANT SAFETY INFORMATION WARNING:

- Always turn off power at the main power source by unscrewing fuse or switching circuit breaker to the off position before installing, removing, cleaning, or servicing thermostat.
- Read all of the information in this manual before installing or programming this thermostat.
- This is a 24V AC low voltage thermostat. Do not install on voltages higher than 30V AC.
- All wiring must conform to local and national building and electrical codes and ordinances.
- Do not short (jumper) across terminals on the gas valve or at the system control to test installation. This will damage the thermostat and void the warranty.

## INSTALLATION LOCATION

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Install the thermostat 4 to 5 feet above the floor in an area with good air circulation and average temperature.

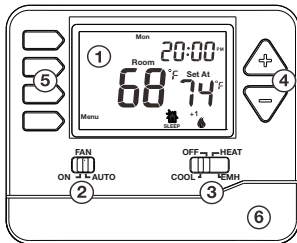
For new installations, mount thermostat on an inside wall, 4-5 feet above the floor. Do not install the thermostat in the following locations:

- Behind a Door
- In a Corner
- Near Air Vents
- In Direct Sunlight
- With an Outside Wall Behind the Thermostat
- Near any Heat or Steam Generating Fixtures
- Near any Concealed Pipes or Chimneys

Installation at these locations will affect thermostat operation.

# THERMOSTAT QUICK REFERENCE

## Getting to know your thermostat

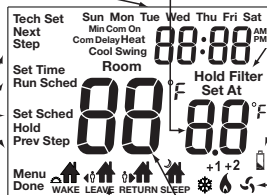


### 1 LCD

Days of the week and time.

Displays the user selected set-point temperature.

- 1 LCD Screen
- 2 Fan Switch
- 3 System Switch
- 4 Temperature Set-Point Buttons
- 5 User Buttons
- 6 Easy Change Battery Door



**Hold:** Is displayed when thermostat program is overridden.

**Low Battery Indicator:** Replace batteries when indicator is shown.

**System Operation Indicators:**

The or icon will display when the COOL, HEAT, or (fan) is on.

### Button Options

**Programmable Time Periods:** This thermostat has 4 programmable time periods per day.

Indicates the current room temperature.

**NOTE:** If these icons are flashing, there is a 5-minute delay for compressor protection.

# WALLPLATE INSTALLATION



## Caution: Electrical Hazard

Disconnect power before installing this product. Failure to do so can cause electric shock or equipment damage.

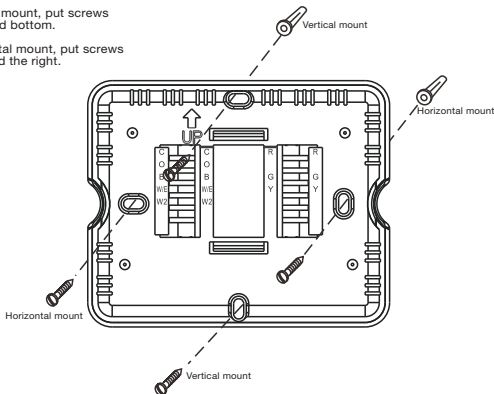


## Mercury Notice:

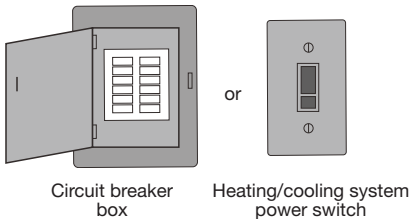
This product is mercury-free. However, if this product is replacing a control which contains mercury, it needs to be disposed of properly. Contact your local waste management authority for instructions regarding recycling and proper disposal of the control.

For a vertical mount, put screws on the top and bottom.

For a horizontal mount, put screws on the left and the right.



## 1 Turn Off Power to Heating/Cooling System

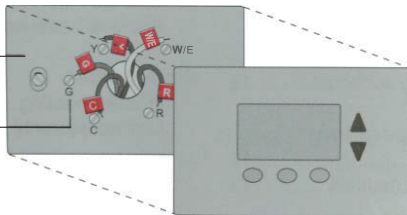


## 2 Remove Old Thermostat

Remove old thermostat but leave wallplate with wires attached.

Do not remove wallplate

Terminal designation



# WIRING

## 3 Label Wires with Tags

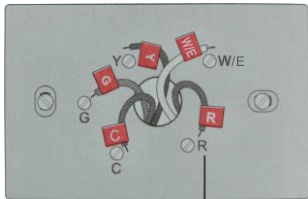
Label the wires using the supplied wire labels as you disconnect them.

### Wiring Labels

Apply these wiring labels to each wire with the appropriate terminal designation as you remove it from the existing thermostat.

|      |      |    |    |    |    |     |     |    |    |
|------|------|----|----|----|----|-----|-----|----|----|
| B    | B    | Y2 | Y2 | C  | C  | W/E | W/E | F  | F  |
| G    | G    | H  | H  | L  | L  | O   | O   | P  | P  |
| R    | R    | RC | RC | RH | RH | T   | T   | U  | U  |
| V/VR | V/VR | W  | W  | W1 | W1 | W2  | W2  | W3 | W3 |
| X    | X    | X1 | X1 | X2 | X2 | Y   | Y   | Y1 | Y1 |
| AUX  | AUX  |    |    |    |    |     |     |    |    |

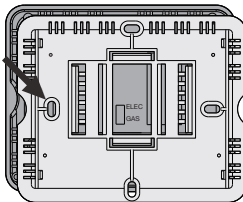
Wire Labels



Terminal designation

## 4 Separate Wallplate from New Thermostat

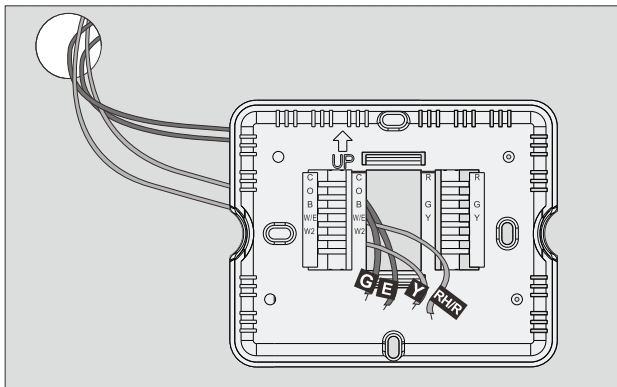
Remove wallplate from the new thermostat and mount onto wall.



Wallplate

## 5 Mount Wallplate for New Thermostat

Mount the new wallplate using the included screws and anchors.



Drill 3/16-in. holes for drywall

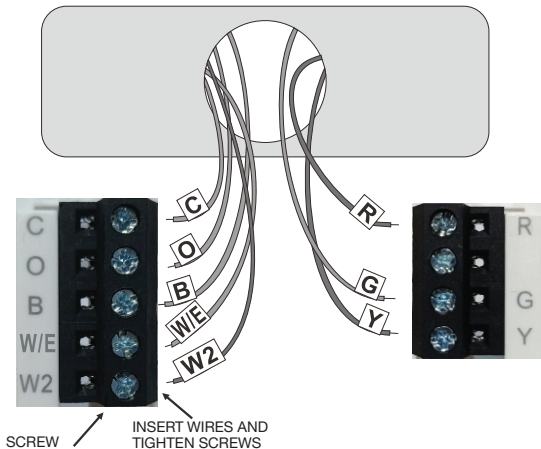
Drill 3/16-in. holes for plaster

# WIRING

## 6 Connect Wires

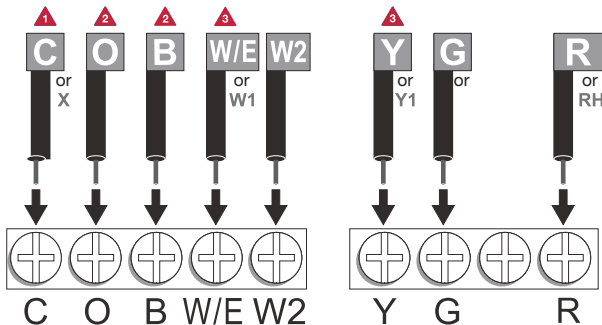
Simply match wire labels.

If labels do not match letters on the thermostat, check "Alternate Wiring (Conventional Systems)" on page 9 and connect to terminal as shown (see notes, below).



## Alternate Wiring (Conventional Systems)

If labels do not match letters on the thermostat, check the chart below and connect to terminal as shown here (See notes, below).



- 1** If there is a **C** or **X** wire available then you can connect with **C** terminal. If there is no **C** or **X** wire then no need to connect with **C** terminal.
- 2** If you have a **heat pump** without auxiliary/backup heat connect either the **O** or **B**, not both. If you do not have a **heat pump**, do not connect **O** or **B**. Wrap bare end of wire with electrical tape.
- 3** Place a jumper (piece of wire) between **Y** and **W** if you are using a heat pump without auxiliary/backup heat.

# WIRING

## Terminal Designations

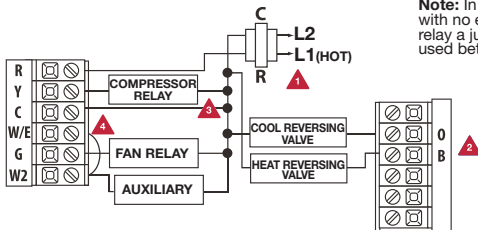
|            | Heat Pump System<br>1 HEAT 1 COOL / 2 HEAT 1 COOL | Conventional System<br>1 HEAT 1 COOL / 2 HEAT 1 COOL |
|------------|---------------------------------------------------|------------------------------------------------------|
| <b>R</b>   | Transformer Power                                 | Transformer Power                                    |
| <b>C</b>   | Transformer Common                                | Transformer Common                                   |
| <b>B</b>   | Reversing Valve<br>Energized in HEAT              | Energized in HEAT                                    |
| <b>O</b>   | Reversing Valve<br>Energized in COOL              | Energized in COOL                                    |
| <b>G</b>   | Fan Relay                                         | Fan Relay                                            |
| <b>W/E</b> | First Stage of Emergency<br>HEAT                  | First Stage of HEAT                                  |
| <b>W2</b>  | Second Stage of HEAT/<br>EMERGENCY HEAT           | Second Stage of HEAT                                 |
| <b>Y</b>   | First Stage of<br>HEAT and COOL                   | First Stage of COOL                                  |

### Installation Tip:

Do not overtighten terminal block screws, as this can damage the terminal block. A damaged terminal block can keep the thermostat from fitting on the subbase correctly or cause system operation issues. Max Torque = 6in/lbs.

- 1** Power supply.
- 2** Use either O or B terminals for reversing valve.
- 3** Optional 24 VAC common connection when thermostat is used in battery power mode.
- 4** Jumper (not supplied).

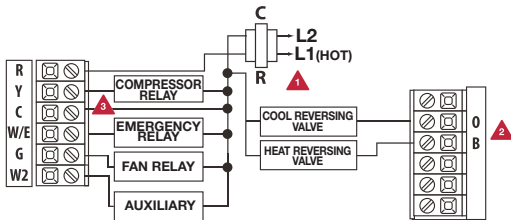
## 2H/1C Heat Pump System



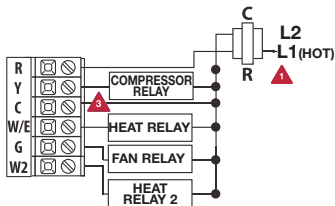
**Note:** In many systems with no emergency heat relay a jumper can be used between E and W2.

## WIRING

### Typical 2H/1C Heat Pump System with separate emergency heat



### Conventional System 1H/1C, 2H/1C (Heat pump set to OFF in tech settings)



**Note:** This thermostat is only compatible with ONE transformer systems.

## Installer Setup Menu

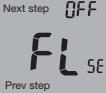
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This thermostat has an installer setup menu for easy configuration. Follow the procedure below to set up the thermostat to match the specific heating/cooling system.

1. Press **MENU**.
2. Press and hold **TECH SET** for 3 seconds.
3. Configure the installer options as desired using the table on page 14.

Use  or  to change settings and **NEW STEP** or **PREV STEP** to move from one option to another. **Note:** Only press **DONE** when you want to exit the Installer Setup options.

# INSTALLER SETUP MENU

| Settings                     |                                                                                                                                                                          | Display                                                                           | Adjustment Options                                                                                                                                                                                                                                   | Default |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| Filter Change Reminder       | This setting will flash <b>FILT</b> in the display after the elapsed run time to remind the user to change the filter. The <b>OFF</b> setting will disable this feature. |  | The filter change reminder can be adjusted from <b>OFF</b> to 2000 hours in 50 hour increments. Press the second button from the top left side of the thermostat to display the current filter elapsed runtime.                                      | OFF     |
| Room Temperature Calibration | This setting allows the installer to change the calibration of the room temperature display so that, for example, the thermostat would read 72°F instead of 70°F.        |  | The room temperature display can be adjusted to read 3° above or below the factory calibrated temperature.                                                                                                                                           | 0       |
| Minimum Compressor On-Time   | The installer can select the minimum run time for the compressor to help protect the compressor from short-cycling.                                                      |  | The minimum compressor run time can be adjusted from <b>OFF</b> to 3, 4, or 5 minutes. If 3, 4, or 5 is selected, the compressor will run for at least the selected time before turning off (although the fan may continue to run for a short time). | OFF     |

## INSTALLER SETUP MENU

| Settings                            |                                                                                                                                                                                                                                                                 | Display                                                                                                     | Adjustment Options                                                                | Default    |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------|
| <b>Compressor Short Cycle Delay</b> | The compressor short cycle delay setting will not allow the compressor to be turned on for 5 minutes after it was last turned off in order to protect the compressor.                                                                                           | Next step<br><br>Prev step | The compressor short cycle delay setting can be removed by selecting <b>OFF</b> . | <b>ON</b>  |
| <b>Cooling Differential</b>         | The cooling differential is factory preset at 0.5°. This means that whenever the room temperature heats by 0.5° from the temperature setting, the cooling system will turn on. If the cooling system turns on too often, increase the temperature differential. | Next step<br><br>Prev step | The cooling differential setting is adjustable from 0.2°F to 2°F.                 | <b>0.5</b> |
| <b>Heating Differential</b>         | The heating differential is factory preset at 0.4°. This means that whenever the room temperature cools by 0.4° from the temperature setting, the heating system will turn on. If the heating system turns on too often, increase the temperature differential. | Next step<br><br>Prev step | The heating differential setting is adjustable from 0.2°F to 2°F.                 | <b>0.4</b> |

## INSTALLER SETUP MENU

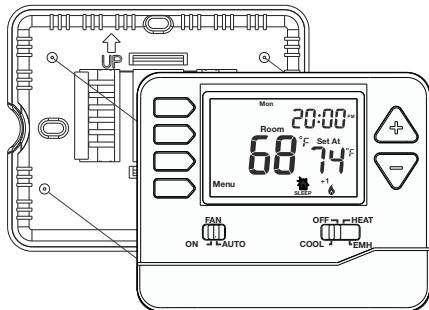
| Settings            |                                                                              | Display                                                                                                     | Adjustment Options                                                                                                                                                                                         | Default |
|---------------------|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| F or C              | Select F for Fahrenheit temperature display or select C for Celsius display. | Next step<br><br>Prev step | F for Fahrenheit<br>C for Celsius                                                                                                                                                                          | F       |
| 12 or 24 Hour Clock | Select a 12 or 24 hour clock setting.                                        | Next step<br><br>Prev step | Use  and  to select 12 or 24 hour clock. | 12      |
| Fan Operation       | Select <b>GAS</b> or <b>ELEC</b> depending on the type of furnace.           | Next step<br><br>Prev step | GAS - GS<br>or<br>ELEC - EL                                                                                                                                                                                | GAS     |

| Settings                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Display                                                  | Adjustment Options                                                                                                                                                                                                                                                        | Default   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <p><b>Program Options</b></p> <p>This thermostat can be configured to have 7 Day, 5+1+1 programming or be non-programmable.</p> <p>If 7 Day is selected, in Set Time all seven days will need to be programmed individually.</p> <p>If 5+1+1 programming is selected, in Set Time Monday–Friday will be programmed together and Saturday and Sunday will need to be programmed individually.</p> <p>If 0d is selected, the thermostat becomes non-programmable.</p> | <p>Next step</p> <p>Pr 00</p> <p>5d</p> <p>Prev step</p> | <p>Use  and  to select <b>7d</b> for 7 Day, <b>5d</b> for 5+1+1, or <b>0d</b> for non-programmable.</p> | <p>5d</p> |

# MOUNTING & BATTERY INSTALLATION

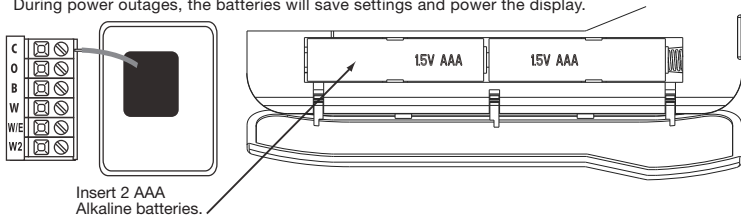
## Mounting Thermostat

Align the 4 tabs on the faceplate with the corresponding slots on the back of the thermostat, then push gently until the thermostat snaps into place.



## Battery Installation

Battery installation is optional if used with AC power (the C terminal is connected). During power outages, the batteries will save settings and power the display.



### Set Time of Day and Day of Week

---

1. Press **MENU**.
2. Press **SET TIME**.
3. Day of the week will be flashing. Use  or  to select the current day of the week.
4. Press **NEXT STEP**.
5. The current hour will be flashing. Use  or  to select the current hour.  
Note the correct a.m. or p.m. indicator is selected.
6. Press **NEXT STEP**.
7. The minutes will be flashing. Use  or  to select the current minutes.
8. Press **DONE** when completed.

# PROGRAMMING

## Default Program

This thermostat is pre-programmed for energy saving operation. The default program is below:

| Default Program |                                                                                          |         |                              |                              |
|-----------------|------------------------------------------------------------------------------------------|---------|------------------------------|------------------------------|
| Day of the Week | Events                                                                                   | Time    | Set-Point Temperature (Heat) | Set-Point Temperature (Cool) |
| Weekday         | Wake    | 6 a.m.  | 70° F (21° C)                | 75° F (24° C)                |
|                 | Leave   | 8 a.m.  | 62° F (17° C)                | 83° F (29° C)                |
|                 | Return  | 6 p.m.  | 70° F (21° C)                | 75° F (24° C)                |
|                 | Sleep   | 10 p.m. | 62° F (17° C)                | 78° F (26° C)                |
| Saturday        | Wake    | 8 a.m.  | 70° F (21° C)                | 75° F (24° C)                |
|                 | Leave   | 10 a.m. | 62° F (17° C)                | 83° F (29° C)                |
|                 | Return  | 6 p.m.  | 70° F (21° C)                | 75° F (24° C)                |
|                 | Sleep   | 11 p.m. | 62° F (17° C)                | 78° F (26° C)                |
| Sunday          | Wake    | 8 a.m.  | 70° F (21° C)                | 75° F (24° C)                |
|                 | Leave   | 10 a.m. | 62° F (17° C)                | 83° F (29° C)                |
|                 | Return  | 6 p.m.  | 70° F (21° C)                | 75° F (24° C)                |
|                 | Sleep  | 11 p.m. | 62° F (17° C)                | 78° F (26° C)                |

You can use the table below to plan your customized program schedule.

| Custom Program  |                                                                                                                                                                            |      |                              |                              |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------------------------|------------------------------|
| Day of the Week | Events                                                                                                                                                                     | Time | Set-Point Temperature (Heat) | Set-Point Temperature (Cool) |
| Weekday         | Wake     |      |                              |                              |
|                 | Leave    |      |                              |                              |
|                 | Return   |      |                              |                              |
|                 | Sleep    |      |                              |                              |
| Saturday        | Wake     |      |                              |                              |
|                 | Leave    |      |                              |                              |
|                 | Return   |      |                              |                              |
|                 | Sleep    |      |                              |                              |
| Sunday          | Wake     |      |                              |                              |
|                 | Leave    |      |                              |                              |
|                 | Return   |      |                              |                              |
|                 | Sleep    |      |                              |                              |

# PROGRAMMING

## Custom Programming

---

This thermostat can be configured to have 7 Day or 5+1+1 programming. If 7 Day is selected, all seven days will need to be programmed individually. If 5+1+1 programming is selected, Monday–Friday will be programmed together and Saturday and Sunday will need to be programmed individually. There are four time periods for each day (**WAKE**, **LEAVE**, **RETURN**, **SLEEP**).

Follow the steps below to customize your program schedule:

1. Select **HEAT** or **COOL**. Note: Heat and cool need to be programmed separately.
2. Press **MENU** (If menu does not appear first, press **RUN SCHED**).
3. Press **SET SCHED**. Note: Monday–Friday (or Monday if in 7 Day mode) will be displayed and the **WAKE** icon is shown.
4. Time will be flashing. Use  or  to make your time selection for the **WAKE** time period for Monday–Friday (or Monday if in 7 Day mode).
5. Press **NEXT STEP**.
6. The set-point temperature will be flashing. Use  or  to make your set-point selection for the **WAKE** time period for Monday–Friday (or Monday if in 7 Day mode).
7. Press **NEXT STEP**.
8. Repeat steps 4 through 7 for the **LEAVE** time period, for the **RETURN** time period, and for the **SLEEP** time period for Monday–Friday (or Monday if in 7 Day mode).
9. Repeat steps 4 through 8 for the Saturday **WAKE**, **LEAVE**, **RETURN**, and **SLEEP** time periods, and then again for the Sunday **WAKE**, **LEAVE**, **RETURN**, and **SLEEP** time periods for the 5+1+1 program schedule, and for each day for the 7-day program schedule.

## Specifications

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|                                     |                                                                                                                |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Temperature Display Range.....      | 41°F to 95°F (5°C to 35°C)                                                                                     |
| Temperature Control Range.....      | 44°F to 90°F (7°C to 32°C)                                                                                     |
| Load Rating.....                    | 1 amp per terminal, 1.5 amp maximum all terminals combined                                                     |
| Display Accuracy .....              | ± 1°F                                                                                                          |
| Differential .....                  | Heating is adjustable from 0.2°F to 2.0°F<br>Cooling is adjustable from 0.2°F to 2.0°F                         |
| Power Source.....                   | 18 to 30 VAC, NEC Class II, 50/60 Hz for hardwire<br>(common wire) Battery power from 2 AAA Alkaline batteries |
| Operating Ambient Temperature ..... | 32°F to +105°F (0°C to +41°C)                                                                                  |
| Operating Humidity.....             | 90% non-condensing maximum                                                                                     |
| Dimensions .....                    | 4.72"W x 3.86"H x 0.98"D                                                                                       |

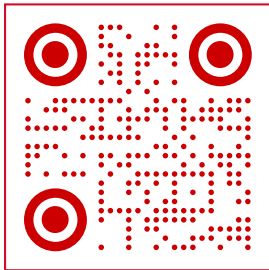






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