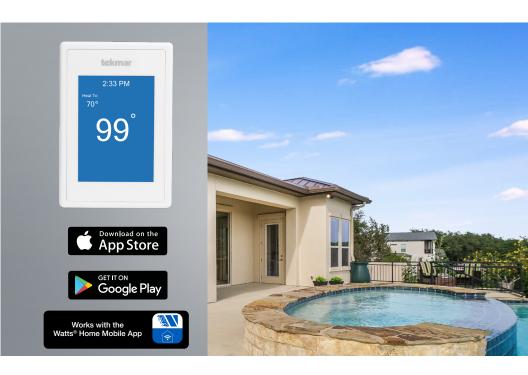
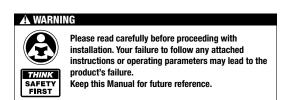
## **Installation, Operation and Maintenance**

# **Wi-Fi Setpoint Control 170**



## **Compatible With**

· 1-stage heating or 1-stage cooling





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# **Important Safety Information**

It is your responsibility to ensure that this thermostat is safely installed according to all applicable codes and standards. tekmar® is not responsible for damages resulting from improper installation and/or maintenance.



This is a safety-alert symbol. The safety alert symbol is shown alone or used with a signal word (DANGER, WARNING, or CAUTION), a pictorial and/or a safety message to identify hazards.

When you see this symbol alone or with a signal word on your equipment or in this Manual, be alert to the potential for death or serious personal injury.



This pictorial alerts you to electricity, electrocution, and shock hazards.

**A** WARNING

This symbol identifies hazards which, if not avoided, could result in death or serious injury.



This symbol identifies hazards which, if not avoided, could result in minor or moderate injury.

NOTICE

This symbol identifies practices, actions, or failure to act which could result in property damage or damage to the equipment.

#### **A** WARNING





Read Manual and all product labels BEFORE using the equipment. Do not use unless you know the safe and proper operation of this equipment. Keep this Manual available for easy access by all users. Replacement Manuals are available at tekmarControls.com

### **A** WARNING

- It is the installer's responsibility to ensure that this thermostat is safely installed according to all applicable codes and standards.
- Improper installation and operation of this thermostat could result in damage to the equipment and possibly even personal injury or death.
- This thermostat is not intended for use as a primary limit control. Other controls that are intended and certified as safety limits must be placed into the control circuit.

#### NOTICE

Do not attempt to service the thermostat. There are no user serviceable parts inside the thermostat. Attempting to do so voids warranty.

# Installation

# Preparation

### **Tools Required**

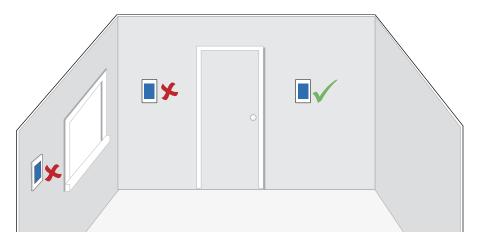
- tekmar or jeweler screwdriver
- · Phillips head screwdriver

- · Wire stripper
- · Drill (for wall anchor)
- 3/16" drill bit (for wall anchor)

## **Installation Location**

## **Materials Required**

18 AWG LVT Solid Wire (Low Voltage Connections)

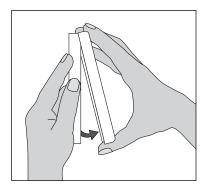


### NOTICE

## Consider the following:

- · Interior Wall.
- Keep dry. Avoid potential leakage onto the control.
- Relative Humidity less than 90%. Non-condensing environment.
- No exposure to extreme temperatures beyond 32-122°F (0-50°C).
- No draft, direct sun, or other cause for inaccurate temperature readings.
- Away from equipment, appliances, or other sources of electrical interference.
- Easy access for wiring, viewing, and adjusting the display screen.
- Approximately 5 feet (1.5 m) off the finished floor.
- The maximum length of wire is 500 feet (150 m).
- Strip wire to 3/8" (10 mm) for all terminal connections.
- · Use standard 8 conductor, 18 AWG wire.

# Removing the Thermostat Base



While holding the base section in one hand, pull the lower half of the display front towards you to pivot it away from the base.

# Mounting the Thermostat

#### **A** WARNING

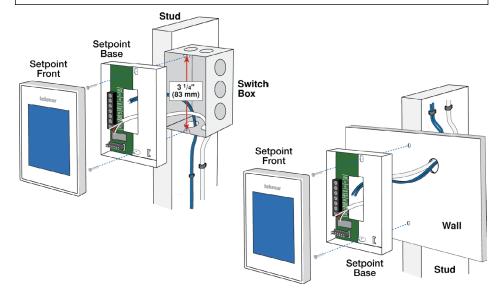


To prevent the risk of personal injury and/or death, make sure power is not applied to the thermostat until it is fully installed and ready for final testing. All work must be done with power to the circuit being worked on turned off.

Please be aware local codes may require this thermostat to be installed or connected by an electrician.

#### **NOTICE**

Avoid mounting the control on metal cover plates or metal surfaces as this may interfere with Wi-Fi signal reception.



The Wi-Fi Setpoint Control 170 heats a pool at a heating setpoint using pulse width modulation. A Zone Control provides 24 V (ac) power to the Setpoint Control and provides 120 V (ac) power to the heat exchanger and hot tub circulators.

## Mechanical

#### Legend

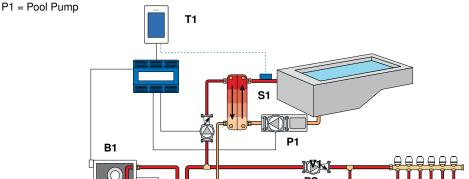
B1 = Boiler

BP = Boiler Pump

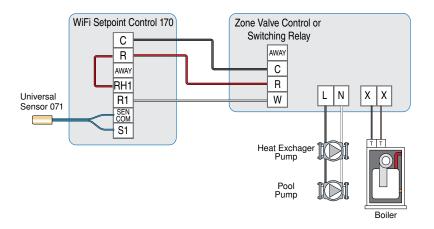
PS = System Pump

T1 = Wi-Fi Setpoint Control 170

S1 = Pool Sensor 071



## **Electrical**



6 IOM-T-170 2432 © 2024 tekmar

BP

The Wi-Fi Setpoint control 170 heats a hot tub at a heating setpoint using an on/off differential. A Zone Control provides 24 V (ac) power to the Setpoint Control and provides 120 V (ac) power to the heat exchanger and hot tub circulators.

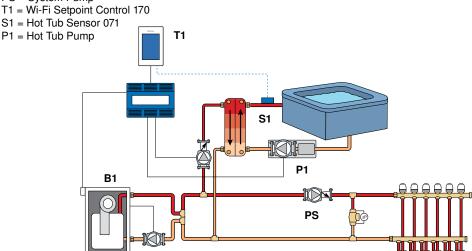
## Mechanical

#### Legend

B1 = Boiler

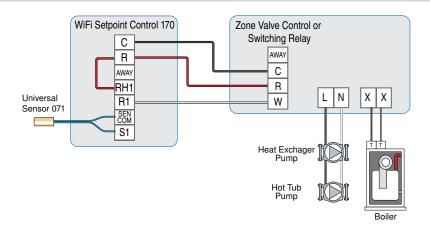
BP = Boiler Pump

PS = System Pump



## **Electrical**

BP



The Wi-Fi Setpoint Control 170 heats an indirect domestic hot water tank from a hydronic heating system at a heating setpoint using an on/off differential. A Zone Control provides 24 V (ac) power to the Setpoint Control and provides 120 V (ac) power to the DHW tank circulator.

**T1** 

## Mechanical

### Legend

B1 = Boiler

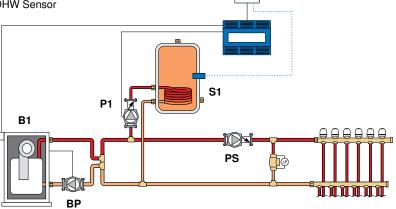
BP = Boiler Pump

PS = System Pump

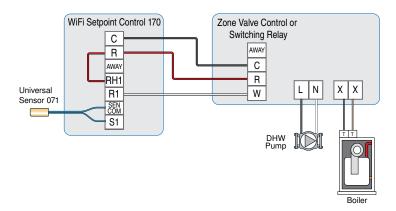
P1 = DHW Pump

T1 = Wi-Fi Setpoint Control 170

S1 = DHW Sensor



# **Electrical**



The Wi-Fi Setpoint Control 170 operates an air conditioning system to provide cooling to a wine cellar room. The 170 is connected to an Indoor Sensor to measure the room ambient temperature. The cooling system operates at a cooling setpoint and an on/off differential.

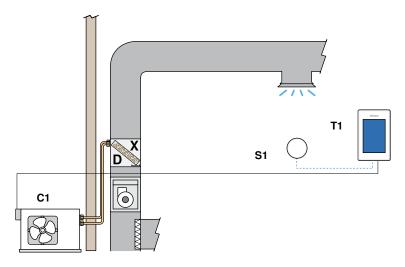
# Mechanical

#### Legend

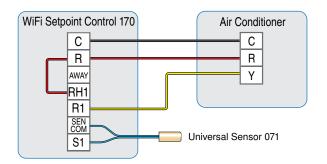
C1 = Air Conditioner

T1 = Wi-Fi Setpoint Control 170

S1 = Indoor Sensor 084



## **Electrical**



# Sequence of Operation

# **Heating Operation**

The heating setpoint can be set from -40 to  $230\,^{\circ}$  F (-40.0 to  $110.0\,^{\circ}$  C). The Heat On symbol is shown on the display when the setpoint control is heating. Heating for freeze protection is provided whenever the sensor temperature falls below  $38\,^{\circ}$  F ( $21\,^{\circ}$  C) and turns off at  $40\,^{\circ}$  F ( $22\,^{\circ}$  C), when enabled.

### On/Off Heating Operation

On/off heating can be set using the Differential Type found in the Relays menu. The relay will close when the sensor temperature is less than the Heat To setpoint and both the On/ Off Differential setting and Time Delay have expired. The relay will open when the sensor temperature is greater than or equal to the Heat To setpoint setting. To prevent any short cycling of equipment there is a minimum 30 second on and off time.

### Pulse Width Modulation (PWM) Heating Operation

PWM heating can be set using the Differential Type found in the Relays menu. The relay will modulate around the Heat To setpoint bounded by the throttling range determined by Differential value. When the sensor temperature is within the throttling range (Heat To setpoint + Differential Value to Heat To setpoint minus Differential value), the relay cycles from 0% to 100% of the cycle length.

- 100% on time at Heat To setting Differential Value
- 50% on time at Heat To setting
- 0% on time at Heat To setting + Differential Value

## **Cooling Operation main header**

The cooling setpoint can be set from -40 to  $230^{\circ}$  F (-40.0 to  $110.0^{\circ}$  C). The Cool On symbol is shown on the display when the setpoint control is cooling.

## On/Off Cooling Operation

On/Off cooling can be set using the Differential Type found in the Relays menu. The relay will close when the sensor temperature is greater than the Cool To setpoint plus the On/Off Differential setting, and the Time Delay has expired. The relay will open when the sensor temperature is less than or equal to the Cool To setpoint setting. To prevent any short cycling of equipment there is a minimum 30 second on time with the off time determined by the Time Delay Value.

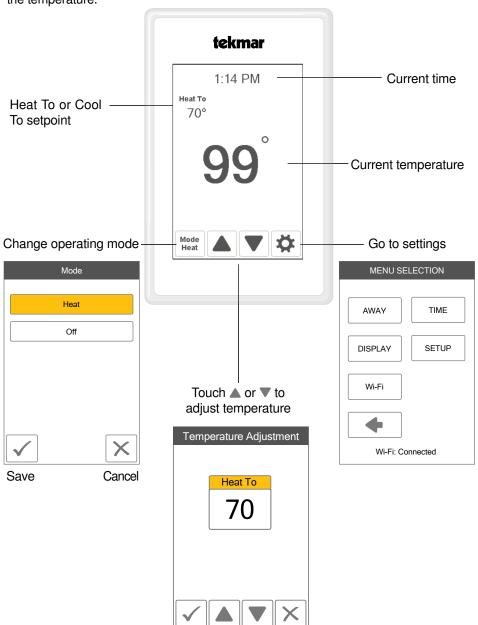
## Pulse Width Modulation (PWM) Cooling Operation

PWM cooling can be set using the Differential Type found in the Relays menu. The relay will modulate around the Cool To setpoint bounded by the throttling ranged determined by Differential value. When the sensor temperature is within the throttling range (Cool To setpoint minus Differential Value to Cool To setpoint plus Differential Value), the relay cycles from 0% to 100% of the cycle length.

- 100% on time at Cool To setting + Differential Value
- 50% on time at Cool To setting
- 0% on time at Cool To setting Differential Value.

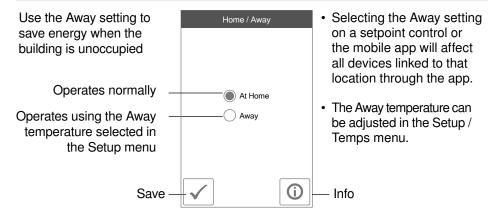
# User Interface

After 60 seconds of inactivity, the thermostat home screen displays only the time and the temperature.



# **User Settings**

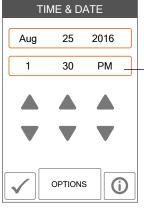
## **Away**



# Display

Setting	Range	Default
TEMPERATURE UNITS Select °F or °C.	°F or °C	°F
BRIGHTNESS ACTIVE Select the brightness when touching the screen.	30 to 100%	100%
BRIGHTNESS INACTIVE Select the brightness when not in use.	Off, 30 to 100%	50%
BACKGROUND Select the background color.	Light, Blue, Night, Latte, Espresso	Blue
LANGUAGE Select the language.	English, Español, Français	English
SCREEN CLEAN Locks screen for 10 seconds to allow cleaning.	N/A	Off

## Time



When connected to the Internet, the time can be set automatically.

The time and date can be manually set by highlighting a field and then using the  $\triangle$  or  $\nabla$  buttons.

Choose from the time options listed below.

Setting	Range	Default
TIME FORMAT Select the time format.	12 or 24 hour	12 hour
TIME SOURCE If Internet is available, the time source can be either automatically or manually set.	Automatic, Manual	Auto
TIME ZONE Select the local time zone.	Hawaii, Alaska, Pacific, Mountain, Central, Eastern, Atlantic, Newfoundland	Eastern
DAYLIGHT SAVING TIME Select if Daylight Savings Time is observed.	Off, On	On

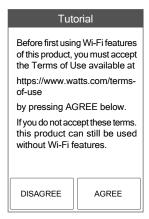
### **NOTICE**

Incorrectly setting the time and date manually may prevent the thermostat from communicating to the mobile app. Automatic time source is recommended when using an Internet connection.

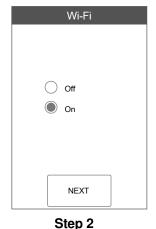
### **NOTICE**

Before using the Wi-Fi features of this product, you must accept the Terms of Use, as amended from time to time and available at Watts.com/terms-of-use. If you do not accept these terms, this product can still be used without Wi-Fi features.

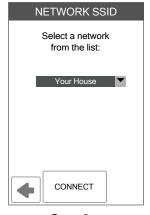
The thermostat includes a step by step tutorial to setup the Wi-Fi connection.



Step 1
Agree to Terms of Use



Turn on Wi-Fi



Step 3
Enter wireless network name.



Step 4
Enter Wi-Fi password.

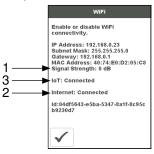


Step 5
Enter ZIP or postal code.
This determines your location for weather information.

# Wi-Fi and Connectivity Troubleshooting

#### Wi-Fi Connection Status

Press > Wi-Fi > Wi-Fi:On > 1 to view the setpoint control connection status.



### (1) Wi-Fi Signal Strength

- The Wi-Fi signal must measure between 0 and -69 dB to have a reliable connection to the Watts<sup>®</sup> cloud.
- A Wi-Fi extender is recommended to be installed if the Wi-Fi signal is between -70 to -100 dB.

## (2) Internet Connected

 The Wi-Fi information screen will show Internet Connected when the setpoint control is connected to the router and there is a connection to the Internet.

## (3) IoT Connected

 The setpoint control connection status will show IoT Connected when connected to the Watts Cloud and the setpoint control is ready to be registered to the app.

If IoT is not connected, please follow these steps:

#### **Check Password**

- Double check that you are using the correct Wi-Fi network and password.
- The password is limited to 32 characters, and can include upper and lower case letters, numbers, special characters and spaces. A space counts as a character.
- The setpoint control supports WPA2-Personal password security.

#### Power Off and On

 Power the thermostat off. Next, power the router off, wait 10 seconds, then power on and wait for the Internet status to be on. Then power the setpoint control on.

#### **Check Router & Firewall**

Consult the router manual or Internet Service Provider (ISP) for assistance with router setup with these configurations:

- The router must provide a 2.4 GHz signal.
   The thermostat is not compatible with 5 GHz networks.
- The router is using WPA2-Personal security.
- The router has DHCP enabled with enough available addresses for all Internet devices.
- The router firewall is not blocking the outbound UDP or TCP ports: 53, 123, 443, 8883.
- The router firewall is not blocking connections to \*.azure-devices.net
- The router firewall is not blocking the thermostat based upon a MAC filter list.

### Create a Wi-Fi Hotspot

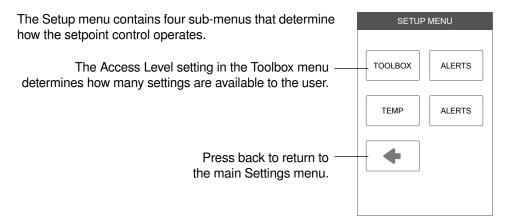
- If you are unable to connect to the Wi-Fi network, try creating a Wi-Fi Hotspot on your mobile device to bypass the router.
- Apple\* iOS Wi-Fi hotspot instructions https://support.apple.com/en-us/HT204023
- Android\*\* Wi-Fi hotspot instructions https://support.google.com/android/ answer/9059108
- If the setpoint control displays IoT connected when using the Wi-Fi Hotspot, please contact your Internet Service Provider (ISP) or IT professional for assistance with the router.

<sup>\*</sup> Apple and App Store are trademarks of Apple Inc.

<sup>\*\*</sup> Google, Android and Google Play are trademarks of Google LLC.

# **Installer Settings**

# Setup



# Setup - Toolbox

Setting	Range	Default
ERROR Displays any error messages.	N/A	N/A
ACCESS LEVEL Select between user and installer access levels. User access level restricts access in the Setup Menu.	User, Installer	Installer
STATUS The current status of the relay.	N/A	N/A
SOFTWARE VERSION Display the software version.	J1313-1.0.5	N/A
LOAD DEFAULTS All settings are returned to factory defaults.	Yes, No	No
CALIBRATE TOUCHSCREEN Recalibrate the screen after loading factory defaults.	N/A	N/A

# Setup - Temp

Setting	Range	Default
HEAT TO AWAY Select the heating temperature when away.	Off, -40 to 230°F Off, -40 to 110°C	Off
HEAT TO MIN LIMIT Select the minimum heating temperature limit.	Off, -40 to 230°F Off, -40 to 110°C	Off
HEAT TO MAX LIMIT Select the maximum heating temperature limit.	Off, -40 to 230°F Off, -40 to 110°C	Off
COOL TO AWAY Select the cooling temperature when away.	Off, -40 to 230°F Off, -40 to 110°C	Off
COOL TO MIN LIMIT Select the minimum cooling temperature limit.	Off, -40 to 230°F Off, -40 to 110°C	Off
COOL TO MAX LIMIT Select the maximum cooling temperature limit.	Off, -40 to 230°F Off, -40 to 110°C	Off

# Setup - Alerts

Setting	Range	Default
SETPOINT HOT WARNING Sends an email notification if the setpoint exceeds this temperature.	Off, -67 to 257°F Off, -55 to 125°C	Off
SETPOINT COLD WARNING Sends an email notification if the setpoint falls below this temperature.	Off, -67 to 257°F Off, -55 to 125°C	Off

# Setup - Relays

Setting	Range	Default
MODE OF OPERATION	Heat,Cool	Heat
DIFFERENTIAL TYPE	On/Off, PWM	On/Off
DIFFERENTIAL	1 to 18°F (0.5 to 10°C)	2°F (When in on/off)
TIME DELAY	0:30 to 30:00 Min	1:00 Min (When in on/off)
<b>DIFFERENTIAL</b> Select if the first stage W1 heats a radiant floor.	3 to 18°F (1.5 to 10°C)	3°F (When in PWM)
CYCLE LENGTH Select if the first stage W1 heats a radiant floor.	1:00 to 30:00 Min	15:00 Min (When in PWM)
FREEZE PROTECTION Select if freeze protection operates the heating system when temperatures are below 40°F (4.5°C).	Off, On	On

# Error Messages

When an error occurs an email notification will be sent to the registered Watts Home mobile app account owner.

## Description

#### INTERNET UNAVAILABLE

The setpoint control has a Wi-Fi connection to the router but is unable to communicate to the Internet. Steps to clear the error include: 1) power off and on the router, 2) power off and on the setpoint control.

#### MEMORY ERROR

The setpoint control memory settings are corrupted. To clear, load the factory defaults in the Toolbox menu. The setpoint control will not operate any heating or cooling equipment while this error message is present.

#### SENSOR FAULT

Due to an open or short circuit, the setpoint control is unable to read the sensor wired to S1 and Com Sen. The setpoint control will not operate any heating or cooling equipment while this error message is present.

Check the auxiliary sensor wire for short circuits according to the sensor installation manual. It may be necessary to replace the auxiliary sensor. Once the error has been corrected, the error message automatically clears.

#### SETPOINT HOT WARNING

The setpoint temperature is above the Setpoint Hot Warning setting in the Alerts menu. The warning will automatically clear once the setpoint temperature falls below the setting.

#### SETPOINT COLD WARNING

The setpoint temperature is below the Setpoint Cold Warning setting in the Alerts menu. The warning will automatically clear once the setpoint temperature rises above the setting.

# Technical Data

Wi-Fi Setpoint Control 170 One Stage Heat / One Stage Cool			
Literature	Submittal, Installation and Operating Manual, Job Record, Watts Home Manual		
Control	Microprocessor control. This is not a safety (limit) control.		
Packaged weight	0.6 lb. (270 g)		
Dimensions	4-5/8" H x 3" W x 15/16" D (118 x 76 x 24 mm)		
Enclosure	White PVC plastic, NEMA Type 1		
Approvals	Meets Class B: ICES & FCC Part 15		
Ambient conditions	Indoor use only, 32 to 122°F (0 to 50°C), RH ≤90% non-condensing		
Power supply	15 to 30 V (ac/dc), 2 VA standby, Class 2		
Relays	30 V (ac/dc), 2 A, Class 2 circuits		
Sensor	NTC thermistor, 10 k $\Omega$ @ 77°F (25°C ±0.2°C) $\beta$ =3892		
- Included	1 of Universal Sensor 071		
- Optional	tekmar type # 070, 072, 073, 076, 077, 079, 084, 087		
Communications	Wi-Fi 802.11n, 2.4 GHz, WPA2 encryption		
Mobile app	Apple iOS 12 or higher, Android 10 or higher		

Notes	

Notes		

# Warranty

Limited Warranty The liability of tekmar under this warranty is limited. The Purchaser, by taking receipt of any tekmar product ("Product"), acknowledges the terms of the Limited Warranty in effect at the time of such Product sale and acknowledges that it has read and understands same.

The tekmar Limited Warranty to the Purchaser on the Products sold hereunder is a manufacturer's pass-through warranty which the Purchaser is authorized to pass through to its customers. Under the Limited Warranty, each tekmar Product is warranted against defects in workmanship and materials if the Product is installed and used in compliance with tekmar's instructions, ordinary wear and tear excepted. The pass-through warranty period is for a period of twenty-four (24) months from the production date if the Product is not installed during that period, or twelve (12) months from the documented date of installation if installed within twenty-four (24) months from the production date.

The liability of tekmar under the Limited Warranty shall be limited to, at tekmar's sole discretion: the cost of parts and labor provided by tekmar to repair defects in materials and/or workmanship of the defective product; or to the exchange of the defective product for a warranty replacement product; or to the granting of credit limited to the original cost of the defective product, and such repair, exchange or credit shall be the sole remedy available from tekmar, and, without limiting the foregoing in any way, tekmar is not responsible, in contract, tort or strict product liability, for any other losses, costs, expenses, inconveniences, or damages, whether direct, indirect, special, secondary, incidental or consequential, arising from ownership or use of the product, or from defects in workmanship or materials, including any liability for fundamental breach of contract.

The pass-through Limited Warranty applies only to those defective Products returned to tekmar during the warranty period. This Limited Warranty does not cover the cost of the parts or labor to remove or transport the defective Product, or to reinstall the repaired or replacement Product, all such costs and expenses being subject to Purchaser's agreement and warranty with its customers.

Any representations or warranties about the Products made by Purchaser to its customers which are different from or in excess of the tekmar Limited Warranty are the Purchaser's sole responsibility and obligation. Purchaser shall indemnify and hold tekmar harmless from and against any and all claims, liabilities and damages of any kind or nature which arise out of or are related to any such representations or warranties by Purchaser to its customers.

The pass-through Limited Warranty does not apply if the returned Product has been damaged by negligence by persons other than tekmar, accident, fire, Act of God, abuse or misuse; or has been damaged by modifications, alterations or attachments made subsequent to purchase which have not been authorized by tekmar; or if the Product was not installed in compliance with tekmar's instructions and / or the local codes and ordinances; or if due to defective installation of the Product; or if the Product was not used in compliance with tekmar's instructions.

THIS WARRANTY IS IN LIEU OF ALL OTHER WAR-RANTIES, EXPRESS OR IMPLIED, WHICH THE GOV-ERNING LAW ALLOWS PARTIES TO CONTRACTU-ALLY EXCLUDE, INCLUDING, WITHOUT LIMITATION. IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, DURA-BILITY OR DESCRIPTION OF THE PRODUCT, ITS NON-INFRINGEMENT OF ANY RELEVANT PATENTS OR TRADEMARKS, AND ITS COMPLIANCE WITH OR NON-VIOLATION OF ANY APPLICABLE ENVIRON-MENTAL, HEALTH OR SAFETY LEGISLATION; THE TERM OF ANY OTHER WARRANTY NOT HEREBY CONTRACTUALLY EXCLUDED IS LIMITED SUCH THAT IT SHALL NOT EXTEND BEYOND TWEN-TY-FOUR (24) MONTHS FROM THE PRODUCTION DATE, TO THE EXTENT THAT SUCH LIMITATION IS ALLOWED BY THE GOVERNING LAW.

Product Warranty Return Procedure All Products that are believed to have defects in workmanship or materials must be returned, together with a written description of the defect, to the tekmar Representative assigned to the territory in which such Product is located. If tekmar receives an inquiry from someone other than a tekmar Representative, including an inquiry from Purchaser (if not a tekmar Representative) or Purchaser's customers, regarding a potential warranty claim, tekmar's sole obligation shall be to provide the address and other contact information regarding the appropriate Representative.

## Need help? Go to our website or contact us.

tekmarControls.com | tekmar.customerservice@wattswater.com | 1-800-438-3903



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