



# HVAC System Solutions

Energy Saving Controls for Residential  
& Light Commercial Buildings



HVAC Systems



Multi-Staging



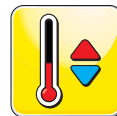
Alternative Energy



Zoning



Snow Melting



Setpoint

**tekmar**<sup>®</sup>  
Better Control. Better Systems.  
A Watts Water Technologies Company





# Complete System Control for Optimal Comfort & Efficiency

## Get the Best Performance From Your Hydronic HVAC System

Many heating & cooling systems are installed with stand alone controls that are only able to operate their part of the system.

tekmar HVAC System Controls integrate all the independent parts into a coordinated system. These controls operate the heat source & heat delivery equipment to provide calculated temperatures for space heating, domestic hot water & other heating needs. System efficiency, comfort & durability are improved when the individual parts work together as a complete solution.

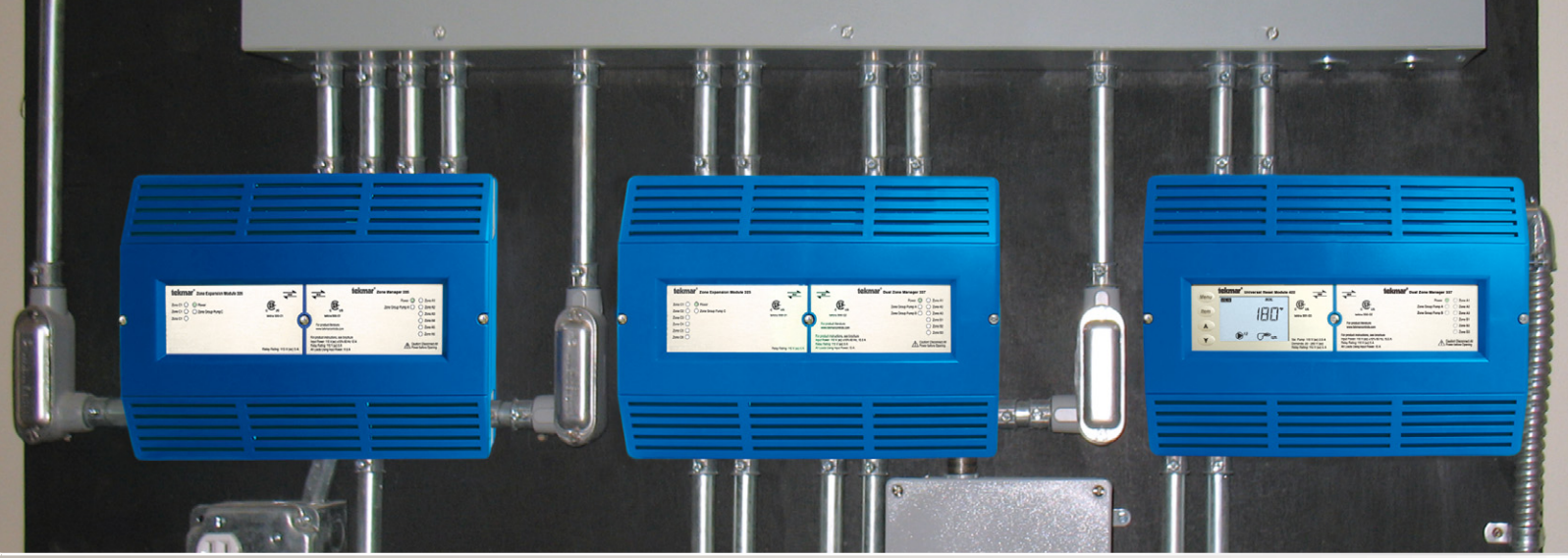
## Reduce Heating Costs

tekmar HVAC system controls are designed to provide comfort using the lowest possible supply water temperatures.

### Why is this important?

- *High efficiency condensing boilers only reach rated efficiencies when operating at low temperatures.*
- *All boiler types will use less energy for most of the heating season, ensuring every dollar spent on heating is put to good use.*
- *Temperature swings are eliminated when the heating system adds just enough heat to equal what is lost by the building.*





## Choose Your Level of Control

Choose from 3 different product lines to suit your application needs. Classic, Performance & Designer series products offer distinct features & benefits to perfectly match your existing system or design requirements.

### Classic Series



Stand alone controls operate hydronic heating equipment with Outdoor Temperature Reset to gain energy savings & indoor comfort. These controls support applications ranging from baseboard or mixed radiant heating systems to combination space heating & domestic hot water or setpoint heating installations.

### Performance Series



Maximize comfort & efficiency with tekmarNet® communication. Benefit from Outdoor Temperature Reset with Indoor Temperature Feedback, shared schedules, system overrides & more. Integrating heating & cooling, applications range from a single zone of baseboard with an on/off boiler, to multiple radiant floor zones with a modulating/condensing boiler, domestic hot water & setpoint heating.

### Designer Series

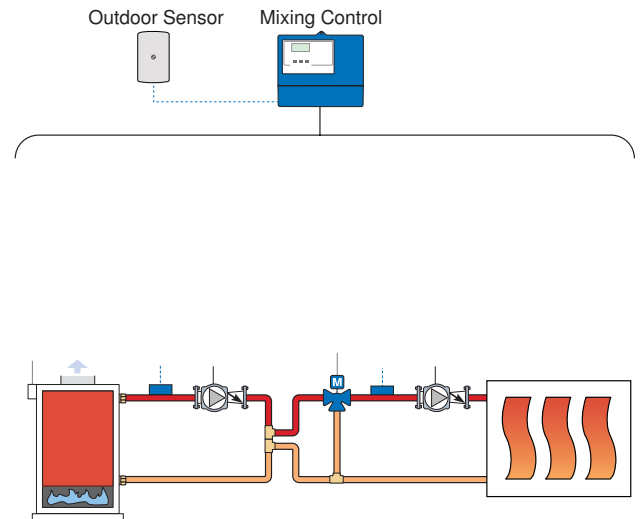
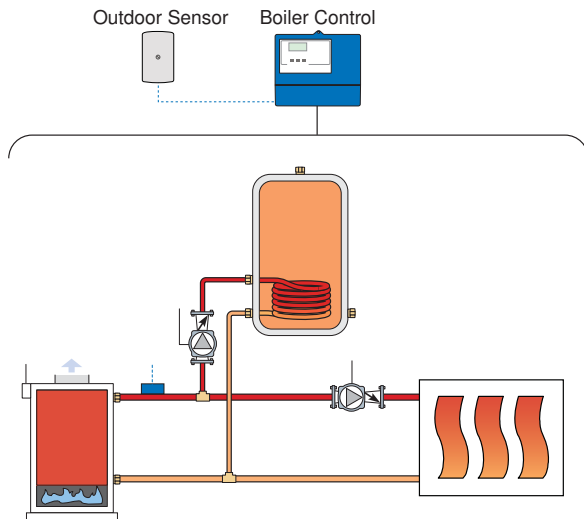


The Designer Series offers the greatest flexibility for advanced multiple boiler & mixing water temperature applications. Control two on/off or modulating boilers, domestic hot water, setpoint loads, & connect up to 24 zones for each space heating water temperature.

# Classic Series

## Outdoor Temperature Reset, Mixing & Domestic Hot Water

Classic series HVAC System Controls add efficiency. Mixing control is offered for systems that require a low water temperature for zoning requirements & boiler protection.



- *Outdoor Temperature Reset*
- *Variable Speed Injection or Floating Action Mixing*
- *Domestic Hot Water Priority*
- *Simplified Wiring*

## Save Energy With Your Existing Heating System

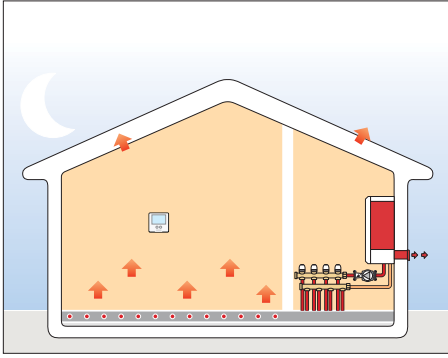
“ Outdoor Temperature Reset Controls Offer an Easy Way to Save 5 to 25% With Your Existing Heating System. ”

Seventy percent of domestic energy consumption is used for space heating & hot water generation. This presents a great energy savings opportunity.

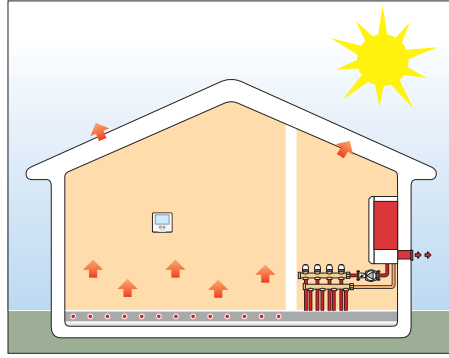
In order to provide comfortable indoor temperatures, the rate of heat supplied to a building must equal the rate of heat loss. The greatest factor affecting how much heat a building requires is the outdoor temperature. Even in a well-insulated building, heat loss increases as the outdoor temperature falls.

tekmar controls with Outdoor Temperature Reset automatically adjust the heating system temperatures to provide comfort using lower water temperatures.

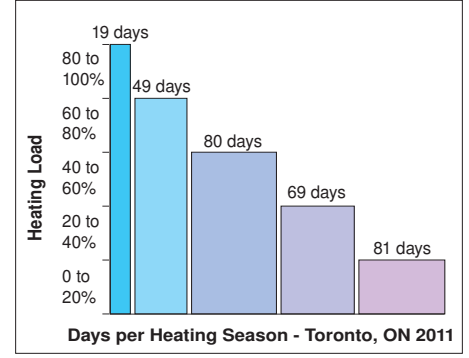
# How Does Outdoor Temperature Reset Save Energy?



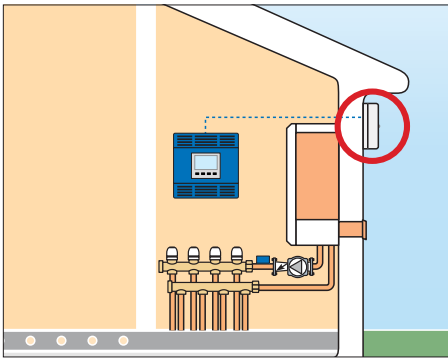
Traditional heating systems do not know if it is a cool autumn night or the coldest day in winter.



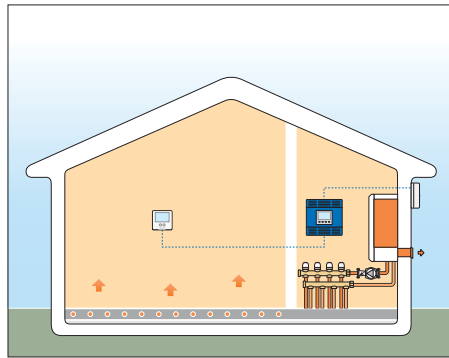
Because of this, the boiler is always operated at a temperature calculated to make up for heat loss on the coldest day of the year.



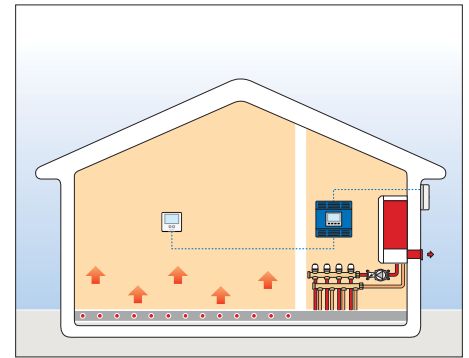
On average, this extreme temperature is needed for less than 10 days a year.



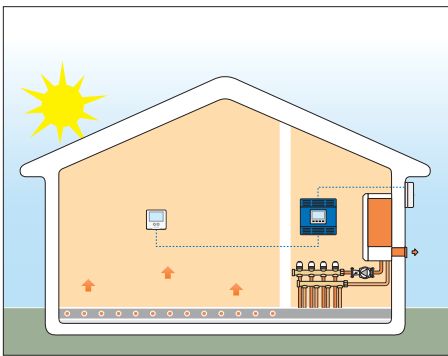
tekmar controls with Outdoor Temperature Reset monitor the outdoor temperature.



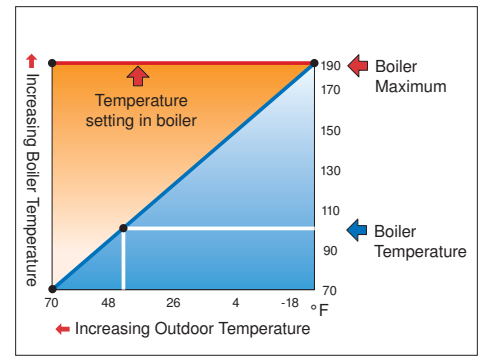
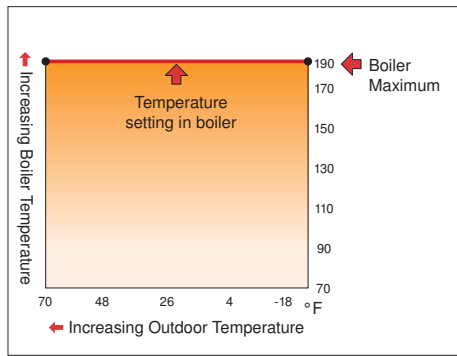
When the thermostat calls for heat, the tekmar control operates the boiler to provide a 'reset' water temperature.



On colder days the boiler water temperature is higher.



On milder days the boiler supply water temperature is lower.



Outdoor Temperature Reset saves energy whenever the boiler is operated below the maximum. With modern condensing boilers, the potential savings increase with the lower minimum operating range.



# Save Even More Energy With tekmarNet<sup>®</sup>

Two way communication between tekmarNet<sup>®</sup> controls & thermostats creates a system that is powerful, yet simple to use.

Features made possible by tekmarNet<sup>®</sup> communication

- *Indoor Temperature Feedback*
- *Zone Synchronization*
- *One touch schedule overrides*
- *Outdoor temperature display on every thermostat*
- *Integration with home automation systems*
- *Web based access to system settings*



## Outdoor Temperature Reset with Indoor Temperature Feedback

Indoor Temperature Feedback adds simplicity to system control setup. Communication with the zones allows the system control to automatically shift the Outdoor Temperature Reset curve based on changes in indoor temperature. When solar or occupant caused heat gains are affecting a zone, the system control can lower supply water temperatures below the target calculated by Outdoor Temperature Reset, saving additional energy.

### Other benefits

- *Reduce the chance of overheating*
- *Improve response time in areas with extensive solar exposure*

Standard  
Boiler Control

180 °F

Outdoor  
Temperature Reset

160 °F

Outdoor Temperature  
Reset with Indoor  
Temperature Feedback

150 °F

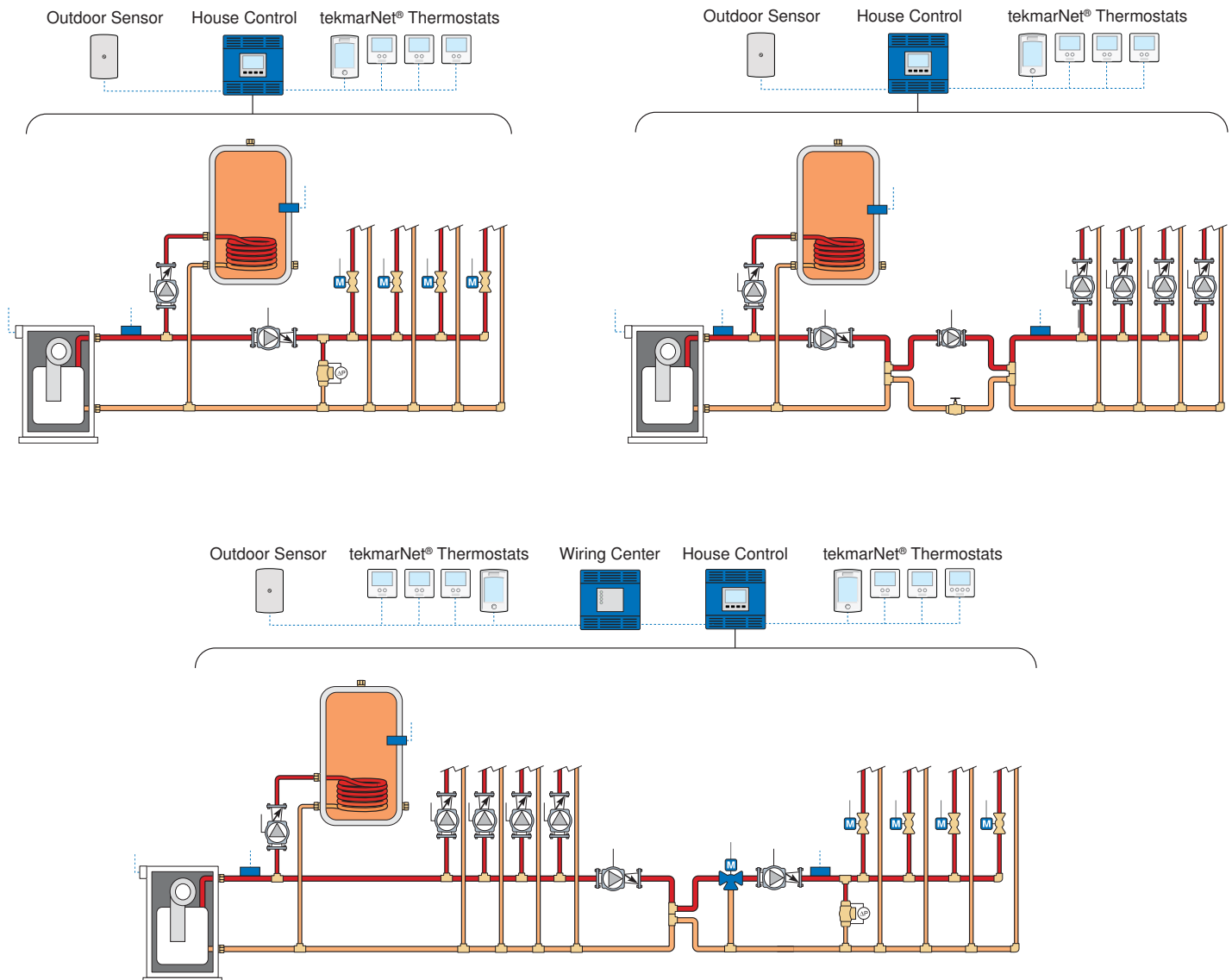
# Performance Series

## Modulating or Two Stage Boiler, Outdoor Temperature Reset with Indoor Temperature Feedback, Mixing, Domestic Hot Water & More

HVAC system controls in the Performance series maximize efficiency & comfort through two-way communication with heating & cooling zones. Indoor Temperature Feedback & Zone Synchronization plus optional features such as one touch overrides, web based system access & home automation integration are made possible through tekmarNet® communication.



- Outdoor Temperature Reset, Indoor Temperature Feedback, Zone Synchronization
- System Overrides & Shared Schedules
- One Two-Stage or Modulating Boiler
- Domestic Hot Water with Pump or Valve
- House Controls Include 4 Zones
- Expandable to 24 Zones Per Water Temperature
- Mixing With Variable Speed Injection Pump or 0-10 V (dc) or 4-20 mA Actuator



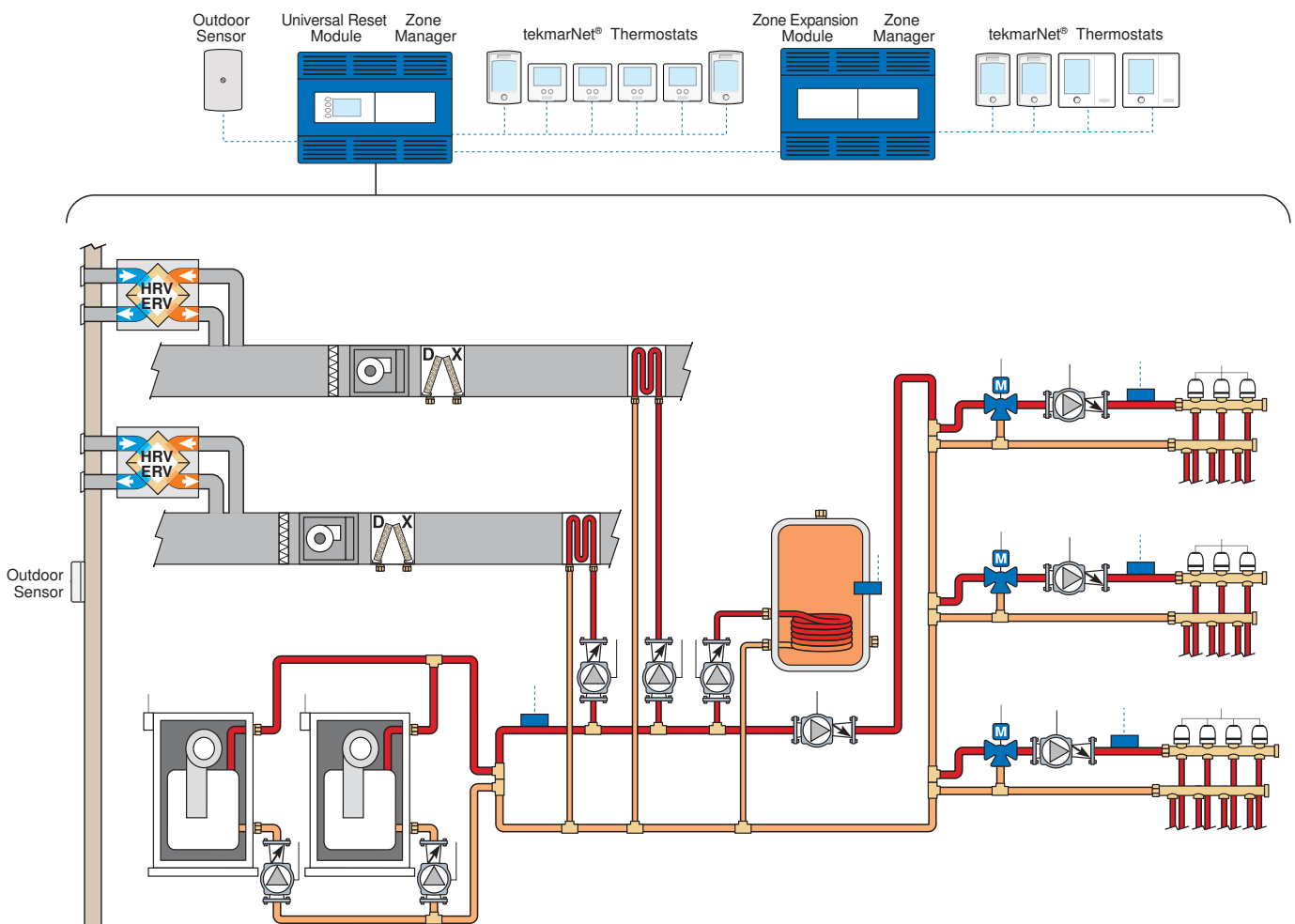
# Designer Series

## One or Two Boilers, Up to Four Water Temperatures, Outdoor Temperature Reset with Indoor Temperature Feedback, Mixing, Domestic Hot Water & More

Designer series HVAC system controls offer the highest level of flexibility with a wide range of supported applications. Through tekmarNet® communication, the system control coordinates heating & cooling to provide maximum efficiency, comfort & durability.



- Outdoor Temperature Reset, Indoor Temperature Feedback, Zone Synchronization
- System Overrides & Shared Schedules
- Up to 2 On/Off or Modulating Boilers
- Up to 4 Water Temperatures
- Domestic Hot Water with Pump or Valve
- Expandable to 24 Zones Per Water Temperature
- Up to 16 Air Groups
- Up to 4 Setback Schedules



In this example, two modulating boilers are staged to reduce energy cost & provide redundancy. Each of the three mixed water temperatures are controlled independently to better match radiant temperature requirements in each area. Second stage air heating improves response time in radiant zones with higher load requirements. For cooling & ventilation, the building is divided up into two areas. Multiple heat only thermostats are included within each cooling area, providing an interlock between heating & cooling operation. Web or home automation system access is optional through the addition of a tekmarNet® Gateway.





## Accessibility Options for tekmarNet® Systems



### tN4 User Switch 479

One simple touch lets you change all thermostats between occupied, unoccupied & away temperature settings. In some systems, the away temperature setting can also suspend domestic hot water generation to save additional energy.



### tN4 Gateway 482

Conveniently access tekmarNet® thermostat settings through your home automation system. View & adjust room temperature settings with the same remote control, touchscreen or software application that controls lighting, entertainment & security settings.



### tN4 Gateway 483

Use a smart phone or computer to access heating & cooling settings from anywhere in the world. Conveniently set temperatures back while on vacation & bring systems out of energy saving mode before arriving home. Take advantage of the ability to monitor system information & temperature trends plus receive alerts & make control adjustments remotely.

# Compare HVAC System Controls

## Classic Series



256      260      261      279      356

### System Requirements

<b>Number of Water Temperatures</b> Flexibility for custom applications	1	1	1	-	1
<b>Number of Boilers</b> Outdoor Temperature Reset control	1	1	2	1	1
<b>Boiler Type</b> On/Off (O) Modulating (M) or Steam (S)	O	O	O	S	O
<b>Multi-Stage Boiler Expansion via EMS</b> Control of additional boilers	-	-	-	-	-
<b>DHW Through Valves (V) or Pumps (P)</b> Domestic hot water operation	-	V / P	-	-	-
<b>Setpoint Operation</b> Hot water for hot-tubs, pools & snowmelt	-	-	•	-	-
<b>Mixing</b> Protects boiler	-	-	-	-	•
<b>Zone Control with Valves (V) or Pumps (P)</b> Up to four onboard zones	-	-	-	-	-
<b>Zone Expansion using Wiring Centers</b> Offers quick installations & simple troubleshooting	•	•	•	•	•

### Features & Benefits

<b>Outdoor Temperature Reset</b> Adjust water temperature based on outdoor temperature for energy savings	•	•	•	•	•
<b>Warm Weather Shut Down</b> Shut down heating systems in warmer weather	•	•	•	•	•
<b>Automatic Differential</b> Manage boiler run times automatically to reduce cycling	•	•	•	-	•
<b>Boiler Return Protection</b> Limits the amount of cool return water to boiler	-	-	-	-	•
<b>DHW Priority</b> Control stops space heating to focus on generating hot water	-	•	-	-	-
<b>Pump Exercising</b> Briefly run pump to prevent seizing	-	•	•	-	•
<b>tekmarNet® Communication - 2 or 4 Wire</b> Network communication provides greater functionality	-	-	-	-	-
<b>Indoor Temperature Feedback</b> Indoor zones report exact heating needs to the system control	-	-	-	•	-
<b>Zone Synchronization</b> Coordinate heat demands, minimize equipment cycling	-	-	-	-	-
<b>Remote Monitoring</b> Access tekmarNet® systems via the internet with a Gateway 483	-	-	-	-	-
<b>Integrate with Home Automation Systems</b> Connect to home automation systems with a Gateway 482	-	-	-	-	-
<b>System Wide Control</b> Add a User Switch to quickly adjust all networked thermostat settings	-	-	-	-	-

1+ Single modulating boiler **or** 2-stage boiler

\* Requires addition of mixing expansion module

# Performance Series

# Designer Series



360      361      362      374      400      401      402      403      422      423

1	1	1	3	1	1	2	2	1&1*	4*
1	1	1	2	1+	1+	1+	1+	1	2
O	O	O	O	O/M	O/M	O/M	O/M	O/M	O/M
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# Better Design, Better Control, Better Systems.

At tekmar Control Systems, we believe the indoor comfort of a building depends on the performance of its heating, ventilating & air conditioning (HVAC) system. That's why tekmar offers affordable control solutions designed to get the best in comfort, efficiency & system performance.

Our focus on innovation to add greater value to our products & services allows us to pioneer technologies & anticipate the needs of tomorrow. We stand by our products & offer in-depth technical support & training to ensure our customers are completely satisfied.

## World Class Technical Support

Our Local Representatives are knowledgeable experts in both HVAC controls & their operating mechanical systems. They offer assistance in system design, product selection & installation support. We're here when you need us most. To contact a Representative in your area, visit [www.tekmarControls.com](http://www.tekmarControls.com)

## Dependable Warranty

We strive to provide the highest quality products to our customers. In keeping with that goal, all of our products are 100% quality tested, & backed by the most dependable 3-year limited warranty in the industry.



## We Offer the Complete Solution

- *A wide range of products to match the needs of today's systems*
- *Manufactured in a state-of-the-art Canadian facility*
- *A network of experienced & knowledgeable representatives*
- *Training & technical tools available to support your success*
- *Dedicated people focused on innovation & customer service*

For more information regarding tekmar products, visit [www.tekmarControls.com](http://www.tekmarControls.com)

**tekmar**<sup>®</sup>  
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