

Section 1.1

System Introduction

The Uponor Climate Cöntrol™ Network System is a next-generation, integrated control solution that transforms how contractors install and control a structure's mechanical system. Because Network can control both water (hydronic) and air systems, it is superior to conventional methods that only control either one or the other.

Network System Benefits

Never Miss an Opportunity

Now, with the Network System, heating, ventilation and air-conditioning (HVAC) contractors can set up the controls for the systems they install rather than surrendering that part of the job to someone else.

Network can also help a contractor maintain a good reputation by ensuring the controls are set up correctly. The contractor who installs the mechanical system understands the sequence of operation; hence, that contractor is in the best position to set up the controls correctly — and the Network System makes the job easier.

Stop Rewiring

With conventional controls, changing the sequence of operation meant rewiring. The Network System keeps the controls flexible via wiring to a control cabinet and making assignments through software. And changing settings are easy with the simple click of a computer mouse — not rewiring. Easy changes equal complete control flexibility.

Reduce System Overhead

The Network System reduces the number of points in mechanical system controls by 40 to 50% on average. A "point" is a wire running between a control and a device, which could be another control, boiler, pump or sensor. Reducing the number of points reduces complexity and saves on wire — reducing costs, increasing profits and making the Network System a competitive solution on all jobs.



Figure 1.1-1: Climate Cöntrol Network System Components

Work More Efficiently

The Network System is a standalone system that supports a connection to the internet for remote access. However, it does not require the internet to function. A contractor can see all settings, operations and temperatures prior to visiting a job site, making troubleshooting more efficient.

Functionality Overview

The Uponor Climate Control Network System integrates hydronic-heating controls with air-heating, cooling, humidity and ventilation controls.

The Network System supports the following functions:

- Boiler operation, boiler staging and rotation for up to five boilers
- Boiler on/off or full modulation control
- Primary pump with supply-and-return sensors
- Domestic hot water (DHW) tanks for up to two tanks
- DHW recirculation
- Ground source heat pumps (GSHPs) for up to two units
- Single or dual tanks for GSHPs
- System pressure sensor
- Secondary pump
- Mixing devices for up to a combination of five modulating valves or injection pumps with supply-and-return sensors
- Snow melting for up to a combination of four zones of full automatic or semi-automatic operation
- Zone pumping for up to 16 pumps with supply-and-return sensors
- Air heat, air cool, fan, humidify and dehumidify functionality for up to eight air handlers or furnaces
- Heat recovery ventilators (HRVs) or energy recovery ventilators (ERVs) for up to eight units
- Carbon dioxide (CO₂) sensor for use with a combination of up to eight HRVs or ERVs
- Zone valves for up to 16 valves
- Zone dampers for up to 16 dampers
- Generic outputs for up to eight devices
- Generic inputs for up to eight sensors or switches
- Up to 99 hydronic radiant zones
- Up to 120 thermal actuators
- Up to 16 air zones for heating and cooling

Communication Protocols

The Network System is based on and complies with the BACnet communication standard, and consists of the following four communicating networks:

- The BACnet master-slave, token-passing (MS/TP) network transfers information among the Network System logic controls, including the Router Main Control (RTR) (A9011000), Primary Equipment Control (PEC) (A9012000), Supply Water Control (SWT) (A9013000), Zone Pump Control (ZPC) (A9014000) and Digital Zone Control Module (DZCM) (A9011500).
- The BACnet MS/TP over LinkNet network provides communications to the remote equipment to execute commands of the mechanical equipment on the field device network.
- The thermostat network provides temperature, setpoints, modes and icon status of the zone(s) to the DZCM.
- The BACnet over Ethernet network allows remote access to the internet or communicates BACnet for multiple systems or third-party BACnet controls.

Wiring Structure

The Network System primarily uses Cat5 cables and RJ45 connectors rather than thermostat wire and terminal blocks used in conventional control systems. Using Cat5 wire and RJ45 connectors provides several benefits:

- Maintains polarity
- Allows testing
- Provides flexibility
- Reduces wire cost

Polarity — In a communication network, each control must transmit (Tx) and receive (Rx) data from other controls in the network. Installers must connect devices to ensure polarity, meaning Tx to Tx and Rx to Rx. When devices are wired incorrectly, they cannot exchange data, and the system performs erratically. Because RJ45 connectors are keyed, meaning they can only plug in one way, devices are automatically connected with the correct polarity.

Testing — You can easily test Cat5 wire cables with a cable tester. In contrast, there is no easy way to test an 18/5 thermostat wire to determine if the wire is shorted or broken.

Flexibility — Using Cat5 wire and RJ45 connectors provides flexibility when planning wiring and control layout on a job. When connecting a Network System

DZCM or field modules, the installer can use homerun or daisy-chain configurations — or a combination of the two.

Note: See **Section 6.6: Wiring Alternatives** for information on homerun and daisy-chain configurations and handling techniques.

Cost — Cat5 wiring costs less than thermostat wire. While connectors add cost and time during installation, an experienced installer will save time with Cat5 because it eliminates the need to strip the wire, strip the ends, terminate the ends or troubleshoot shorted or broken wires.

Architecture Drawing

The Network System is completely modular. Contractors save money by ordering only the pieces needed for a specific job. See **Figure 1.1-2** for a high-level overview of all the system components. The number after each component name indicates how many of that component the system can support.

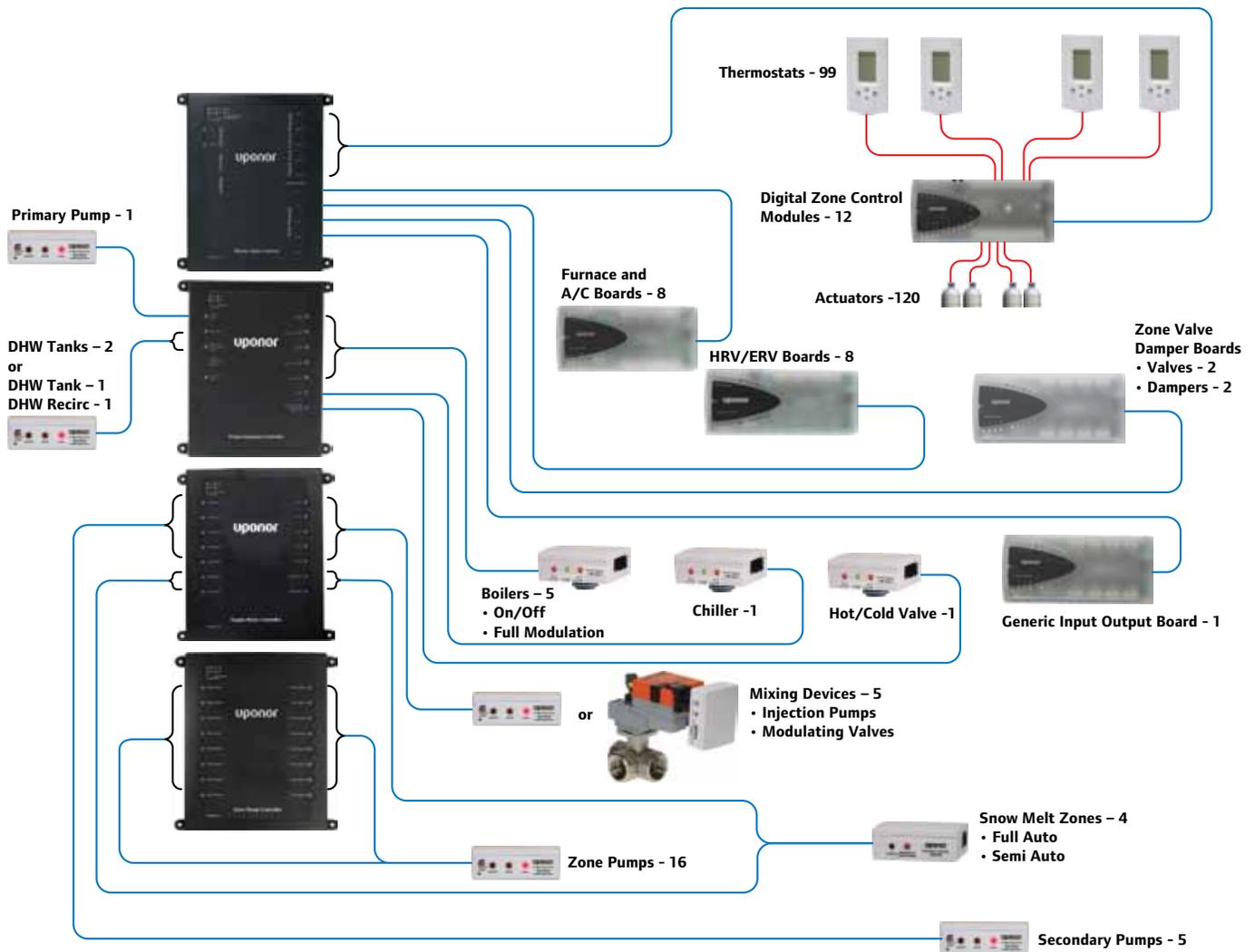


Figure 1.1-2: Uponor Climate Control Network System Components

