



## Application Design Note

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### Hybrid Hot Water Maintenance System: A Combination of Recirculation and HWAT Designs

In high rise residential construction, it is fairly common for the plumbing engineer to recirculate the hot water main but not the branch piping. This is done to minimize the wait for hot water at the point of use in the condominium. The water in the main stays hot, but because the hot water line serving the condominium is typically not recirculated, the water temperature in the branch piping goes to ambient when there is no hot water flow. These horizontal distribution lines are difficult to recirculate because of pressure and balancing in the high rise building. Furthermore, the risers don't always line up vertically because the floor plan of each unit may be different. Home owners are therefore required to run showers or sinks for long periods of time to draw new hot water into the unit, which is a significant waste of water.

The Raychem® HWAT system offers a solution utilizing self-regulating heating cables and the HWAT-ECO electronic controller, in conjunction with the recirculation system. This combination of recirculated hot water mains and the HWAT system for the horizontal piping is the best of both worlds. The engineer can simply heat trace the horizontal hot water lines within the condominium to provide the owner with instant hot water. Different floor plans are also not a problem because the HWAT heating cable simply attaches to the hot water piping regardless of the configuration.

The drawing in Figure 1 shows a typical hot water riser with recirculation and heat traced horizontal hot water lines feeding the condominiums. The HWAT system is installed following the design guidelines in the HWAT System Installation and Operation Manual (H57548). The pipes can be heat traced with either HWAT-Y2 or HWAT-R2 depending upon the hot water temperature and if a heat cycle is desired.

Multiple horizontal runs can be controlled as long as the HWAT heating cable maximum circuit length is not exceeded, the same cable is on each run and the ambient conditions are the same for each pipe. The system shown in Figure 1 includes eight circuits of HWAT-R2 heating cable each 50 feet long, which can be wired in parallel to a junction box and controlled by a single HWAT-ECO controller.

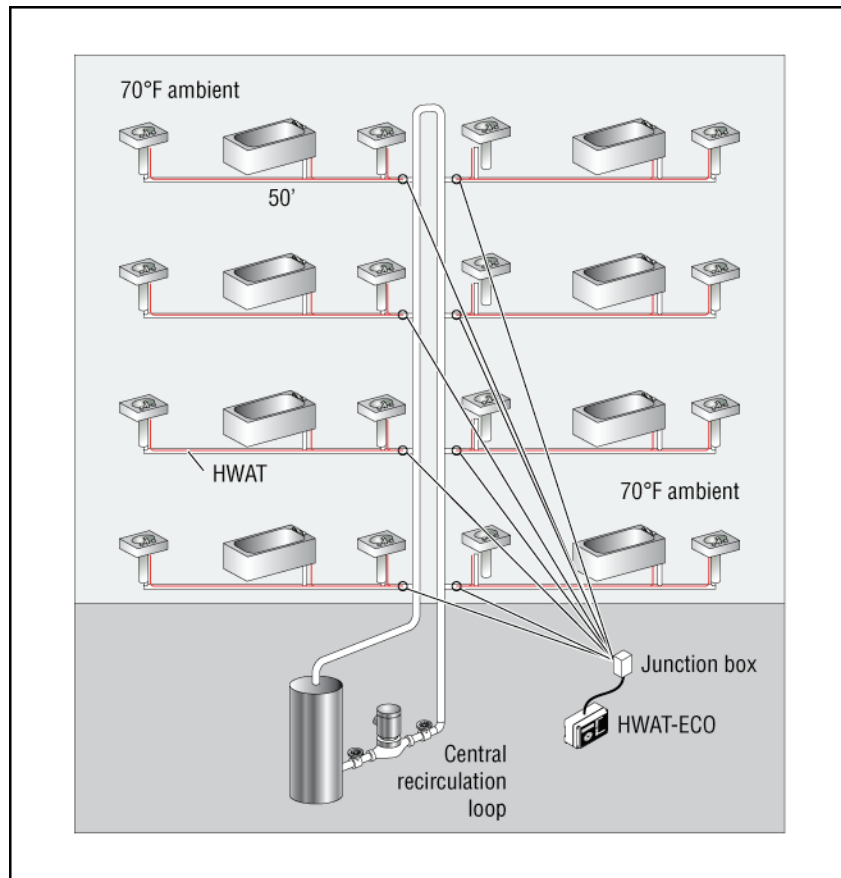


Figure 1: Generic Hybrid HWAT System

- Heating Cable:** HWAT-R2 or HWAT-Y2, use only one cable type per controller.
- Circuit Length:** Total heating cable must be  $\leq$  maximum circuit length.
- Insulation:** Install in accordance with the Installation and Operating Manual to maintain uniform pipe temperatures.
- Ambient:** Pipes must be in uniform ambient conditions.

Install the system in accordance with the HWAT System Installation and Operation Manual (H57548) and the HWAT-ECO Installation and Maintenance Manual (H57340).

Approvals and performance are based on using Tyco Thermal Controls approved connection kits and accessories, do not substitute parts.