



## RediHeat Instantaneous Water Heater

### Description

The RediHeat is a steam (shell side) to water (tube side) heat exchange package that incorporates a unique feed-forward temperature control system to instantly produce hot water within  $\pm 4^{\circ}\text{F}$  of the set temperature under widely varying demands. This outstanding performance makes the RediHeat the ideal solution for domestic hot water applications where tight temperature control and instant response to changes in demand are required.

### Temperature Control

Water temperature is controlled by a mechanical blending valve that operates based on demand. A manual adjustment compensates for seasonal changes in cold water supply temperature. The blending valve has a fail-safe design ensuring consumers can never be exposed to hot water at temperatures above set point – vital for domestic hot water applications. Potential failure or damage to the unit will produce only cold water.

### Heat Exchanger

The RediHeat features a spiral tubed helical heat exchanger for efficient heat transfer in a compact space. The coiled tube technology does not require tube supports allowing the tubes to be in very close proximity resulting in a more compact heat transfer bundle. The helical design of the coil allows it to expand and contract with temperature change such that any scale that has hardened on the inside of the tubes is broken up by the changing shape of the coil. The rugged casing and bourdon tube configuration also allows the entire assembly to expand and contract in response to temperature change without localized stressing. This is ideal for intermittent cycling that is common with domestic hot water applications.

### Efficiency

The typical domestic hot water system only places a demand on the heat exchanger 15% of the time. The feed forward design of the RediHeat only consumes energy when responding to demand. With no hot water storage required, this mode of operation can save as much as 40% in energy costs when compared to a hot water tank system.

### Anti-Bacterial

The perfect environment for the growth of legionella bacteria is stagnant water between  $68^{\circ}\text{F}$  and  $122^{\circ}\text{F}$ . The presence of scale and sediment only expedites colonization. With the RediHeat feed-forward design, water is over-heated to  $160^{\circ}\text{F}$  -  $200^{\circ}\text{F}$  in the heat exchanger before being blended (in response to demand) with incoming cold water to the desired output temperature. In this way the presence of stagnant water at bacteria-friendly temperatures is eliminated.

### Recirculation System

A problem many hot water systems encounter is the delayed supply of hot water to fixtures that are a substantial distance from the heater. During idle periods, heat loss in the piping system will result in cool water at the faucet until hot water produced from the heater is able to reach that point. Delays in providing hot water at the faucet can result in user dissatisfaction. To provide instantaneous



hot water on demand in systems with long pipe runs a recirculation system incorporating a pump (not included) to maintain constant flow should be installed. The RediHeat recirculation system maintains loop temperatures by measuring the temperature of the returning hot water and, dependent on temperature, either passing it back through the heat exchanger for re-heating or diverting it back to the hot water loop.

### Installation

With a footprint of only 6.5 square feet and a height of 33.5" for the largest unit, the RediHeat is the most compact instantaneous water heater available – important when space is at a premium. The unit requires no extraneous power sources, controls or temperature sensors making installation quick and simple. The RediHeat may be wall or floor stand mounted or can be suspended from the ceiling. Approximately 3' clearance from the floor is required to allow room for steam and condensate connections and the hot water outlet. An optional angle iron stand is available and recommended for floor mounting. For optimal heater performance, the steam trap should discharge to 0 psig, below the level of the trap. If lift of condensate is required or the trap must discharge to a back pressure, an automatic pump trap (APT) should be fitted for correct operation. Contact Spirax Sarco for details. The steam inlet pressure to the heat exchanger is limited to 15 psig. Greater steam supply pressures require installation of a pressure regulator. A pressure relief valve set at 75 psig (for RH-30 & RH-60) or 50 psig (for RH-90 & RH-120) should be installed in the steam inlet pipe downstream of the pressure regulator if steam pressure to the heat exchanger can exceed these limits. Acceptable cold water inlet pressure range is 30 to 150 psi. Water pressure must be at least 15 psi greater than steam pressure for correct operation. The RediHeat incorporates an integral pressure relief valve (located on side of the blending valve) to relieve excess water pressure caused by thermal expansion.

*Local regulations may restrict the use of this product below the conditions quoted. Limiting conditions refer to standard connections only. In the interests of development and improvement of the product, we reserve the right to change the specification.*

TI-12-008-US 3.13

# RediHeat Instantaneous Water Heater

## Maintenance

When maintenance on the helical heat exchanger is required, the coiled tube bundle can be either removed for cleaning or cleaned in place. Due to the helical design, removal is easy and does not require the withdraw space typical with other shell and tube designs. An acid pump cleaning system is available for cleaning the coil in situ when poor water quality can result in scaling.

## Typical Specification

The domestic hot water heater shall be a Spirax Sarco RediHeat steam-fired, instantaneous water heater incorporating feed forward temperature control to instantly produce hot water within +/-4°F of the set temperature under widely varying demands. The unit will incorporate an ASME code stamped helical coil heat exchanger and blending valve. The coiled tube bundle must be capable of being removed for inspection and service without breaking steam connections or removing the unit from its installed position. The unit shall be completely self-contained and require hook-up only to steam and water. There shall be no electric or pneumatic requirements. Each heater shall be a factory assembled package with the capacity to heat \_\_\_ gpm of water from \_\_\_ to \_\_\_ degrees Fahrenheit without the use of thermostatic control devices or storage tanks. Supply steam pressure is \_\_\_ psig.

RediHeat Model	RH-30		RH-60		RH-90		RH-120	
<b>Performance</b>								
Nominal maximum output (gpm)	30		60		90		120	
Capacity	Heat 40 °F water up to 140 °F. Outlet temperature adjustable.							
Steam inlet pressure	10 to 15 psig standard 20 to 250 psig requires pressure regulator (H package)							
Steam flow	Approximately 50 lbs/hr per 1 gpm of water heated.							
Water inlet pressure	30 to 150 psig (must be at least 15 psi above steam pressure for correct operation)							
<b>Connections (NPT)</b>								
Potable Water: In – Out	1½"	2"	2"		2½"		2½"	
Steam In - Condensate Out	3"	1¼"	3"	2"	4" ANSI	2"	4" ANSI	2½"
<b>Materials of Construction</b>								
Steam side piping	Steel							
Potable water side piping	Brass							
Heat Exchanger (standard)	Cast iron shell, copper tubes							
Heat Exchanger (options)	Cast steel shell Tubes: admiralty, 70/30 Cu Ni, 316SS & Double Wall (copper only)							
Blending Valve	Bronze body, Hastalloy valve plug, Neoprene diaphragm							
<b>Design</b>								
Blending Valve	Instantaneous: responds to pressure differential Fail-safe (cold) Integral pressure relief valve							
Piping	Quick disconnect Victaulic fittings							
Pressure	Potable water side: 150 psi Steam side: 50 psi (RH-90 & RH-120), 75 psi (RH-30 & RH-60)							
Certification	ASME Section VIII							
<b>Accessories</b>								
Included with RediHeat	Steel frame, steam inlet pressure gauge, water outlet temperature gauge							
Required (not included)	Main and Drip traps plus strainers							
Optional	"H" (pressure reducing) package, angle iron stand, recirculation package, solenoid safety shut-off system, thermal insulation blanket, OSHA cover, chemical cleaning system							
<b>Nominal Dimensions (inches)</b>								
Height	21		22½		33		33½	
Width	22½		25		23½		24½	
Length	31½		31½		31½		39	

TI-12-008-US 3.13