



**Patterson-Kelley**

# DID YOU KNOW???

(Per ASHRAE 50.28 - Boilers for Indirect Water Heating - Applications 2011)

**You can SIGNIFICANTLY save on capital equipment purchases AND increase your combustion efficiency for water heaters if you follow this little known rule...**

When domestic water is heated indirectly by a space heating boiler, Figure 27 (see attached sheet) may be used to determine the additional boiler capacity required to meet the recovery demands of the domestic water heating load. Indirect heaters include immersion coils in boilers as well as heat exchangers with space-heating media. Because the boiler capacity must meet not only the water supply requirement but also the space heating loads, Figure 27 indicates the reduction of additional heat supply for water heating if the ratio of water heating load to space-heating load is low.

This reduction is possible because:

Maximum space-heating requirements do not occur at the time of day when the maximum peak hot water demands occur.

Space-heating requirements are based on the low-

est outside design temperature, which may occur for only a few days of the total heating season.

An additional heat supply or boiler capacity to compensate for pickup and radiation losses is usual. The pickup load cannot occur at the same time as the peak hot water demand because the building must be brought to a comfortable temperature before the occupants use hot water.

So let's do an example:

Domestic Water Load - 1,000 MBH

Heating Load - 4,000 MBH

Ratio =  $\frac{1,000 \text{ MBH Domestic Water Load}}{4,000 \text{ MBH Heating Load}}$

Ratio = 0.25

Factor = 0 (from Fig 27 on attached sheet)

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1,000 MBH Domestic Water Load x "0 Factor" = 0 MBH

No additional equipment is needed when the ratio is 0.25 or less!!!

If your ratio is above 0.25 then you will need to add some capacity to your boiler. Your selection of boilers may already have this extra capacity built in OR all you have to do is slightly upsize the selections.

Benefits Include:

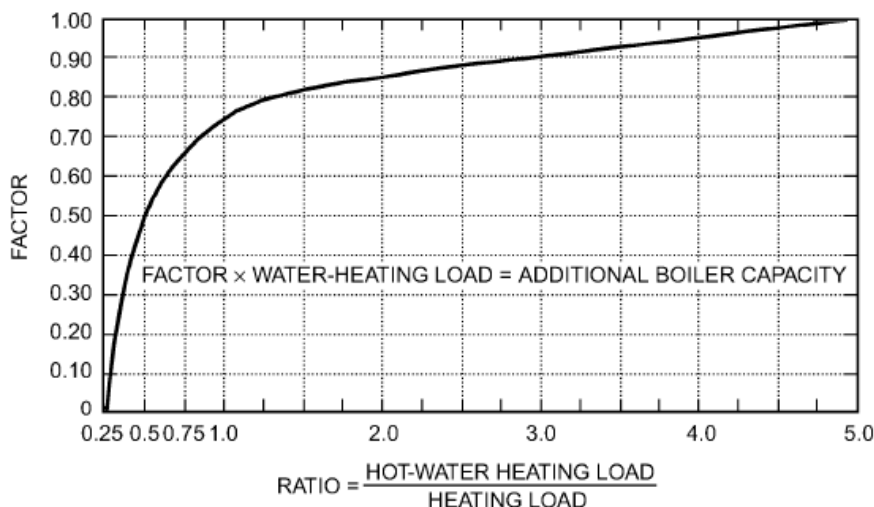
- Reduction of Physical Space Requirements
- Reduction of Piping, Gas Line, Venting, and Electrical Service
- Reduced Initial Costs
- Reduced Operating Costs (due to higher

efficiency equipment)

- Reduced Maintenance, Etc...
- Increased Operating Efficiency (Boilers stay in condensing mode when a plate and frame is used as the heat exchanger)
- Higher Redundancy

(Below charts from ASHRAE 49.25 - Boilers for In-direct Water Heating)CONTENT

Attached are some solutions for indirect water heating equipment that can be used. Please contact us for additional information or equipment selections. The descriptions and technical data in this brochure are subject to change without notice. Contact your local Harsco Industrial Patterson-Kelley representative for the most up-to-date information and product application support.



**Fig. 27 Sizing Factor for Combination Heating and Water-Heating Boilers**

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## DURATION™ Condensing Water Heating System

Highly efficient so you can cash in on energy savings

**Problem:** Domestic hot water heating systems operate under some of the harshest conditions of any building utility system. Fluctuating loads and water quality are major contributors, increasing wear and tear on the boiler, reducing efficiency and capacity, ultimately driving up costs.

**Solution:** Protect your investment by extending the life of your boiler with the DURATION™ condensing water heating system. The DURATION™ provides an intermediary heat exchanger to isolate the domestic hot water supply loop from the condensing boiler loop, providing a barrier between the harsh conditions and the heating boiler.

**Problem:** Potable water can contain a large amount of dissolved solids that bake onto hot heating surfaces to form scale. Over time, this scale builds up, reducing equipment efficiency and leading to premature system failure.

**Solution:** Unlike direct-fired water heaters where the hot side of the heat exchanger can reach 2100°F, DURATION™ condensing water heating systems operate at temperatures between 120°F and 140°F, with a maximum of 200°F. This lower temperature results in less scaling, helping maintain peak efficiency and performance.



Domestic Water Recovery				Boiler Water as Energy Source		
DURATION™ Model #	Flow Rate (GPM)	Inlet Temp (°F)	Outlet Temp (°F)	Inlet Temp (°F)	Outlet Temp (°F)	Flow Rate (GPM)
CWHS 300	5.4	40	140	145	115	18
CWHS 450	8	40	140	145	115	27
CWHS 750	13.4	40	140	145	115	45
CWHS 1050	18.8	40	140	145	115	63
CWHS 1500*	26.8	40	140	145	115	90
CWHS 2000*	35.8	40	140	145	115	120

\* Single wall heat exchanger only

Domestic Water Recovery				Boiler Water as Energy Source		
DURATION™ Model #	Flow Rate (GPM)	Inlet Temp (°F)	Outlet Temp (°F)	Inlet Temp (°F)	Outlet Temp (°F)	Flow Rate (GPM)
CWHS 300	9.3	60	120	130	100	18.5
CWHS 450	13.8	60	120	130	100	28
CWHS 750	23.1	60	120	130	100	46.5
CWHS 1050	32.4	60	120	130	100	65
CWHS 1500*	46	60	120	130	100	93
CWHS 2000*	61	60	120	130	100	124

\* Single wall heat exchanger only

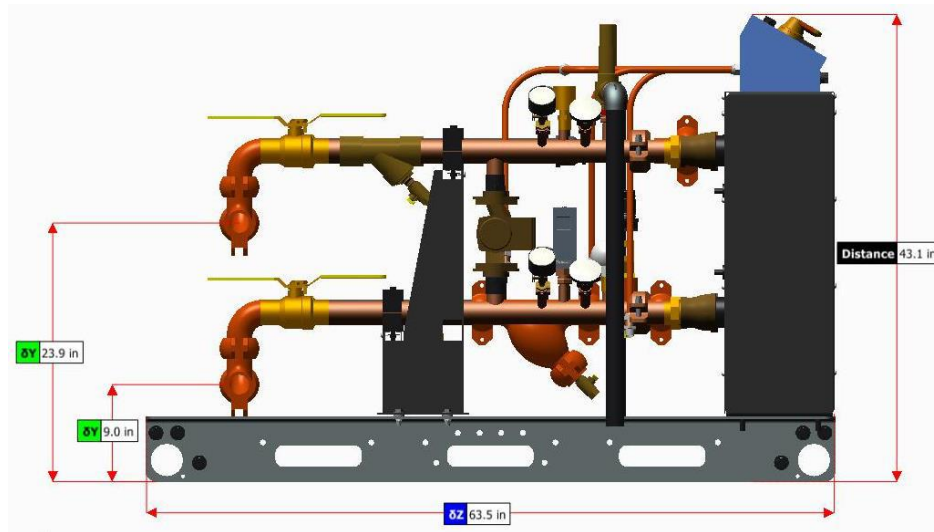
Contact your local Harsco Industrial Patterson-Kelley representative for assistance in selecting the optimal MACH® boiler, heat exchanger and storage tank to complete your DURATION™ condensing water heating system.

**Custom Models Available Upon Request**

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## DURATION III SUMITTAL INFO



Model	D2DW-30S	D2DW-30D	D2DW-80S	D2DW-80D
	Domestic Hot Water			
Recovery GPH @ 40°F to 140°F*	25 GPM	50 GPM	65 GPM	130 GPM
Recovery GPH @ 60°F to 120°F*	55 GPM	110 GPM	85 GPM	170 GPM
Electrical Supply	120VAC, 1 Phase, 60Hz (20 Amps Max)			
DHW Heat Exchanger	Double Wall Brazed Plate – ASME Section VIII – Div 1.			
Plate / Brazing Material	316 Stainless Steel Plates w/ Copper Brazing			
	Boiler Water (Closed Loop)			
Pipe Material	2" Sch. 40 Steel			
Design Entering/Leaving Temp	160 °F / 100 °F			
Design Flow Rate (40°F -140°F)	42 GPM	84 GPM	108 GPM	216 GPM
Design Flow Rate (40°F -140°F)	62 GPM	124 GPM	115 GPM	330 GPM
Flow Device	3-Way Diverting Valve			
Skid Width	32"			

\*Recovery Rates Can Vary Based on Incoming Temperatures, Flow Rates, Temperatures, Flow Rates, etc.