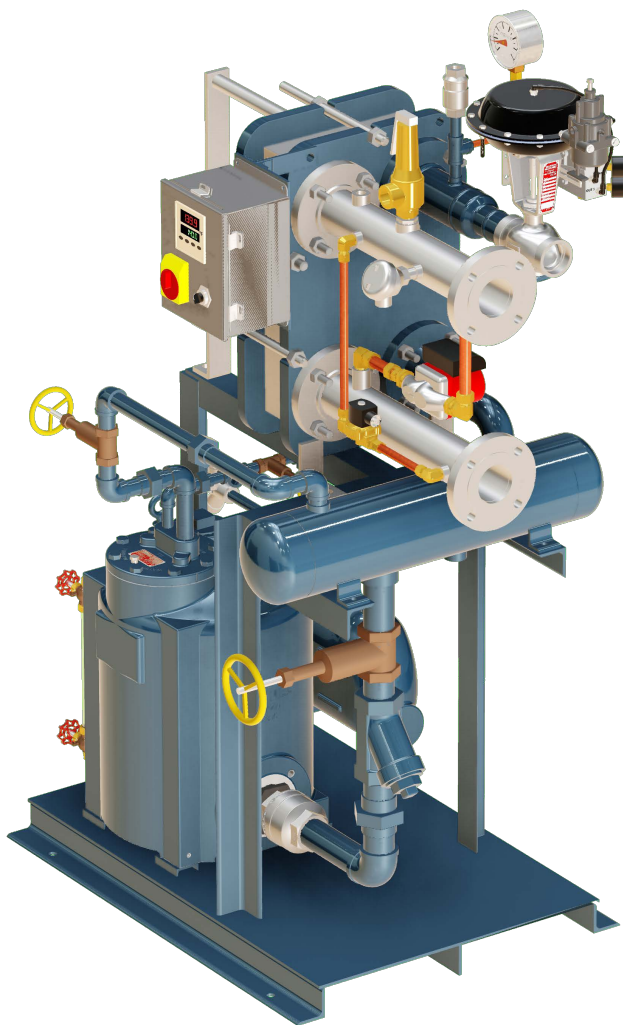


Heat Miser

Compact and Energy Efficient Water Heating Solution



Manufacturing High-Quality Steam & Fluid Specialty Products for Industry

www.watsonmcdaniel.com

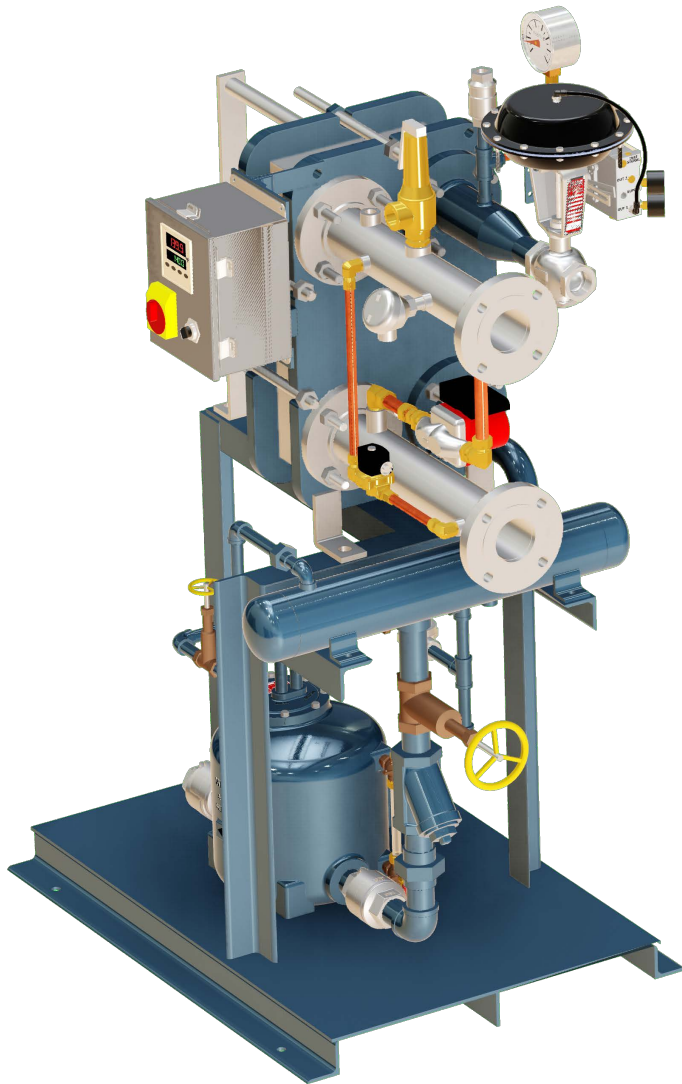


Proudly Made in
U.S.A. since 1878

428 Jones Boulevard • Limerick Airport Business Center • Pottstown, PA • 19464
Tel: 610-495-5131 • Fax: 610-495-5131

Heat Miser

The **INSTANTANEOUS**, compact, *healthier* solution to hot water demands



The Heat Miser is an Instantaneous Steam to Water Heater which produces hot water from steam. The Watson McDaniel fully-assembled Heat Miser eliminates the need for large hot water storage tanks and saves significant energy.

HEALTHIER WATER

Watson McDaniel's Heat Miser eliminates large volume storage of hot water where temperature stratification and sediment accumulation can support the growth of Legionella. It also flash heats the water to a high temperature to kill pneumophila.

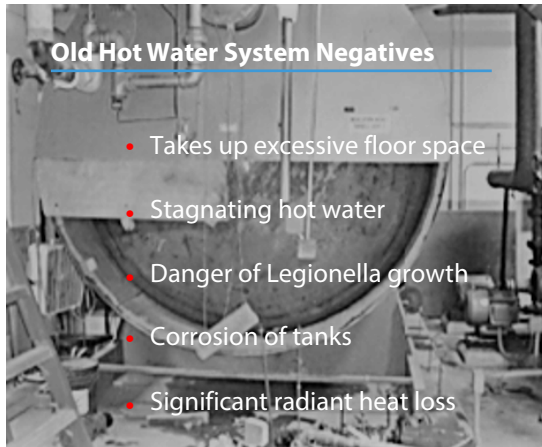
Common Applications

- Hospitals
- Food & Beverage Facilities (CIP & SIP)
- Schools & Universities
- Hotels
- Residential Apartment Buildings
- Process Washdown Stations

Why **INSTANTANEOUS**?

More than ever, clean and safe hot water is needed.
The Heat Miser will provide that quickly and efficiently.

The issues with hot water storage tanks...



LEGIONNAIRES' DISEASE

An estimated **8,000 to 10,000 people** are hospitalized with Legionnaires' disease each year in the USA. The disease is contracted when a person breathes in a mist or vapor that has been contaminated with the Legionella bacteria, which are found naturally in the environment, usually in stagnant warm water. According to the CDC, Legionnaires' disease **can be fatal in 5 to 30% of cases.**

The key to preventing infection is keeping Legionella bacteria out of your water.

Get hot water quickly, efficiently, and safely with a **Heat Miser**

Less Space • Less Energy • More Savings

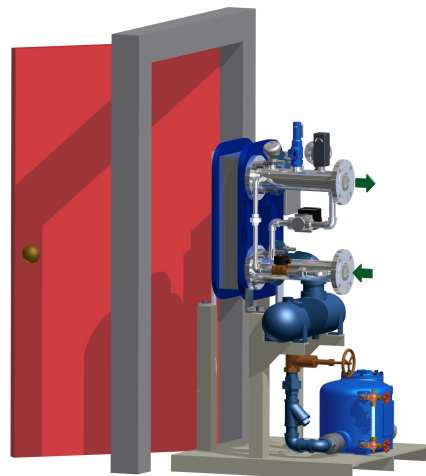
The Heat Miser provides hot water efficiently, when it's needed, and with minimal waste. These systems require less energy and maintenance leading to significant cost savings.

New Heat Miser System

- Small footprint (typical floor space of 14 ft²)
- Efficient plate & frame heat exchanger maximizes turbulent flow for instantaneous hot water on demand
- Stainless Steel waterside components
- Simple maintenance and reduced overall costs

Compact & Convenient Design Offers Installation Flexibility

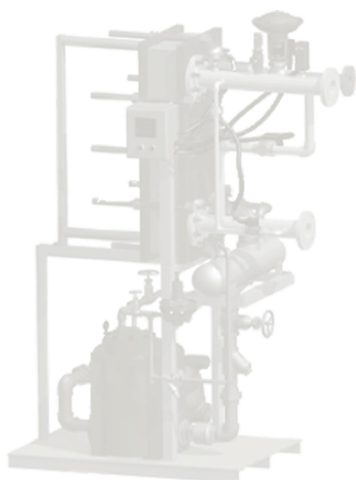
Many systems are configured to accommodate standard 36" door & entry ways.



Design & Performance

Expect more from your system.

Watson McDaniel is a leader in steam and fluid system expertise. Our history with finding economical solutions to system problems spans over 140 years. Combined with our design experience and expert fabrication, we can provide these solutions with unparalleled turn-around.



Heat Miser Benefits

- Meets the rigorous demands of domestic water heating
- Accommodates extreme load fluctuations without the need for storage tanks
- Accurate control of outlet water temperature for many systems to $\pm 2^{\circ}\text{F}$, and $\pm 8^{\circ}\text{F}$ for wide and sudden load fluctuations
- High-efficiency Plate & Frame Heat Exchanger optimized for use with low pressure steam and offers typical flow rates up to 300 GPM, with higher flow rate designs available
- Excellent for washdown stations
- Integral Control Panel included for ease of operation and system feedback
- Electric and Pneumatic Control Valves available for precise steam control
- Condensate drainage options available for efficient operation in vacuum under low demand

Expect more from your solutions provider.

The Watson McDaniel Difference

- ASME qualified welders and certifications
- ASME U and UM Stamp availability on appropriate components
- Complete assembly and pressure testing prior to shipment
- Better control of design, cost, and quality by avoiding 3rd party fabricators
- Unparalleled turn-around and deliveries with many systems available for shipment within only a few weeks

Increase Efficiency and **Reduce Cost**



Hospital in central Florida

The hospital was relying on two aging domestic hot water storage systems which were used to supply critical hot water to the facility. The units needed continuous repairs and were losing condensate due to regular tube bundle failures as a result of poor quality steam supply and improper condensate return.

Watson McDaniel sales technician and engineering team worked closely with the hospital engineers to provide not only energy-efficient instantaneous steam-to-water heaters to replace the existing storage systems, but also developed an overall solution for system improvement. This included proper steam supply conditioning as well as effective condensate drainage with a pump-trap.

In addition to reducing energy costs, the reduced footprint of Heat Miser systems allowed space for two systems, each able to handle the full water capacity load of the hospital, providing 100% redundancy. With the removal of the inefficient hot water storage systems, greatly reduced maintenance costs and the increase in valuable energy from the condensate now being returned to the boiler, the estimated **annual savings totaled to over \$15,000 / year.**

Improve **Safety**

Textile facility in Western South Carolina

A textile facility in South Carolina was in need of replacing a dilapidated hot water storage system used by the staff restaurant kitchen area. The old system was no longer able maintain temperature control of the water and was continually overheating the water to unsafe levels and was a risk for personal use. The high limit safety relief device constantly dumped the hot water to drain which lead to a high waste of energy use and natural resource.

The Watson McDaniel solution was to install a closed loop instantaneous steam to hot water Heat Miser package. This design removed the need for inefficient hot water storage tanks, and provided fast, accurate temperature control needed for domestic hot water applications. The package also came provided with added **safety features to eliminate overshoot and spikes in hot water temperature, keeping the end users safe.**

The installation provided the added benefit of reducing the energy consumption of the old unit and reduced water consumption. The annual savings totaled over an estimated \$17,000 / year.



Component Details

A great system starts with great components.

Getting hot water instantaneously requires quick response and precise control. The components of the Heat Miser were designed to exceed the demands of instantaneously heating water and have the proven reliability expected from Watson McDaniel.

The standard Heat Miser is offered with an ultra-efficient Plate & Frame Heat Exchanger with steam-rated EPDM gaskets and single wall 316 SS plates. Optional double wall and shell & tube designs also available.

Control is everything.

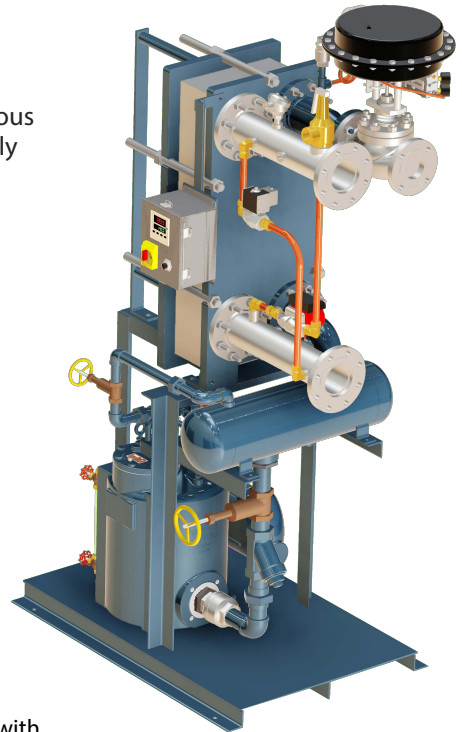
Whether pneumatically or electrically actuated, the HB Series all stainless steel 2-way control valve is designed to withstand the rigorous requirements of on-demand water heating and quickly and accurately respond.



A Pneumatic Actuator and Electro-Pneumatic positioner are standard and ideal when compressed air is available and accessible.

The fast-acting and robust EC Series Electric Actuator has all the features needed to exceed the expectations of on-demand water heating using steam when pneumatic lines are not available. It is extremely fast-responding and uses supercapacitors for fail-safe function in the event of power loss or signal failure.

Standard Control Panel includes NEMA 4X enclosure with user-friendly Electronic PID Controller with Full Auto-Tune Capability, Controller and Pump On/Off Selector Switches, Conduit and Pre-Wired for 120VAC Electrical Connection.



Controllers - Basic Interface and Set-up or Advanced Features and Communication?



The TR890 Series Electronic PID Controller is designed for use on applications where large load changes are expected. It combines powerful functionality with a simple user interface in addition to full auto-tune capabilities and a large selection of available inputs.

The NANODAC Series PID Controller adds features such as data recording and Modbus Communication (BACnet is optional). Standard features include (4) universal analog inputs, (2) 4-20 outputs, (3) mechanical 2A relays, and 110-230VAC power supply. Other power and controller options available; Consult factory.



Steam Trap or Pump-Trap?



Float & Thermostatic Steam Traps properly discharge condensate when conditions allow drainage by gravity. Many options available.
(Vacuum breaker & air vent recommended.)

Pump-traps provide optimum temperature control when condensate must be lifted or return pressure is elevated. They also allow the system to operate efficiently in vacuum on low demand without flooding the heat exchanger. Low-profile, integral trap options as well as high-capacity, external trap options available.



Standard Auxiliary Components

- Steam Inlet & Condensate Return Y-Strainers
- Steam Inlet Pressure Gauge
- SS Electronic Temperature Sensor
- Cold Water Injection Valve
- SS Recirculation Pump with Unions
- Carbon Steel Reservoir
- SS and Copper with Lead-Free Brass Waterside Piping
- Pressure & Temperature Safety Relief Valve
- Base, Frame, and Interconnecting Piping

Options to meet your specific needs.

Hi-Limit Steam Shutdown Safety

Recommended Option:

With a Steam Isolation Valve and dedicated sensor for overtemp protection, this package is *strongly recommended* to prevent equipment damage or bodily harm in the event of failure.

Double Wall Construction

Double Wall plate option provides protection from potential contamination.

Options for Aggressive Water

Titanium plate option available when chloride levels in water exceed 150 ppm.

Water-to-Water and Glycol-to-Water Options

When steam is not available or water is preferred. Consult factory for available options, including glycol systems.

Custom Shell & Tube Heat Exchanger Packages



Many options available, including horizontal, vertical, and special materials of construction

Sizing Guidelines

Appropriate **Sizing** is Key to Accurate Control

Rely on our steam system expertise help you obtain the information needed to size a Heat Miser just right. Determining the true flow requirements of a specific application can be difficult. Watson McDaniel will work with you to properly calculate or measure water flow rates to size the most accurate and efficient Heat Miser.

Consider these key questions when sizing a Heat Miser:

- *What are the actual normal, minimum, and maximum flow rates of the water to be heated?*
- *Is there any high-demand equipment that will quickly turn on, requiring large flow rates of heated water instantly?*
- *Does the facility have a recirculation loop or is it dead-end service?*
- *Will the Heat Miser be sized for potential, future water demand or just for existing demand?*
- *What are the water hardness and chlorine levels?*

A complete test of boiler and domestic water is recommended as water quality may negatively affect the performance of heat exchangers from corrosion or scale buildup. Consult factory with water quality reports for full analysis.

Typical Methods for Sizing Heat Misers

Estimate

Use sizing charts on following pages to estimate usage per fixtures and various equipment

Calculate

Analyze equipment individually and accurately calculate usage for each

Measure

Use flow meter(s) to measure true usage in a facility

Special Service - Portable Water Metering

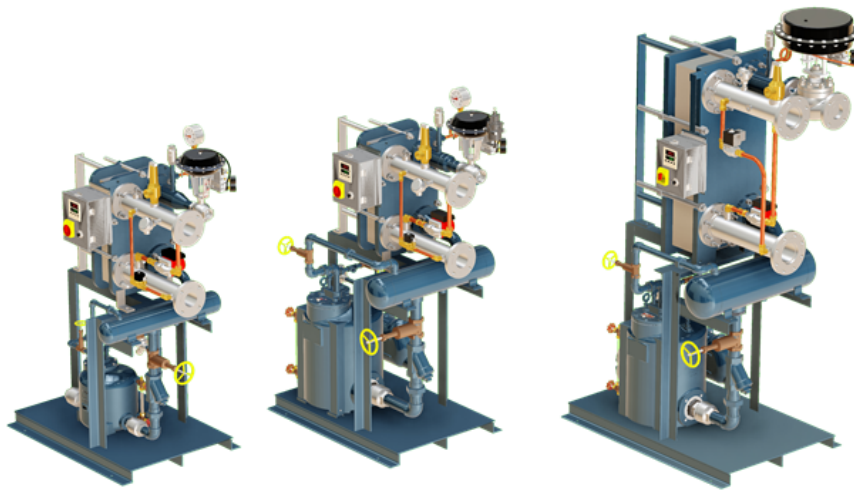
Getting accurate information for sizing is the key to providing solutions that exceed expectations. Therefore, Watson McDaniel offers a service using portable, transit time flow meters to measure the actual hot water usage in your facility over an extended period of time to provide normal, minimum, and peak demands. The flow meter conveniently connects externally to active piping, so no labor or system interruption is required.



For more information, ask your Watson McDaniel representative.

Standard Packages to Get You Started...

The Heat Miser is offered in (5) standard packages and (3) frame sizes for general applications when sizing is appropriate.



1P Frame

2P Frame

3P Frame

Inlet/Outlet Water	Inlet/Outlet Steam	Steam Load (lbs/hr) @ 100°F Temp Rise	Model Code	GPM	Footprint Dimensions (in)
3"	1 1/2" x 1 1/2"	1,030	1P10	20	46" L x 30" W x 67" H
3"	2" x 1 1/2"	2,061	1P20	40	46" L x 30" W x 67" H
3"	2 1/2" x 2"	3,091	2P28	60	46" L x 30" W x 73" H
3"	3" x 2"	4,122	3P20	80	54" L x 34" W x 92" H
3"	3" x 2"	5,152	3P28	100	54" L x 34" W x 92" H

...or **Customize** to Optimize

We can help!

Watson McDaniel specializes in customizing systems to meet customer needs. With our design expertise and unmatched fabrication capabilities, you can be assured to get the instantaneous water heating system to satisfy your requirements.



Simply complete and submit the **Request For Quote (RFQ)** form on the back cover of this brochure.



Then, we can work together to build the appropriate Heat Miser for your needs.

Estimating Hot Water Demand

"How much hot water is needed?"

This is the key question to properly size a Heat Miser. Whether replacing an old system or starting from scratch, a critical element is evaluating the accurate usage requirements for the unit. If the exact flow rate (in gpm – gallons per minute) is not known or specified for your facility, follow the steps below to estimate the total flow requirement.

STEP 1

Do you know the exact flow rate of water to be heated in your facility?

YES

Refer to previous page for Standard Packages.

NO

Proceed to Step 2.

STEP 2

Do you know the exact number of fixtures within your facility?

YES

Use **Table A** on opposite page to determine actual fixture unit count. Refer to Sample below as a guideline. Then, proceed to Step 3.

NO

Use **Table B** below to determine estimated fixture unit count. Refer to Sample below for reference. Then, proceed to Step 3.

NOTE: This method is not preferred due to accuracy concerns which may result in oversizing.

Sample using Table A (Facility: School, Fixture Count: Known)

60	public lavatories	X	1.00	FU	=	60
6	service sinks	X	2.50	FU	=	15
4	kitchen sinks	X	0.75	FU	=	3
6	showers	X	1.50	FU	=	9
Total FU's						87

Number of Fixtures Fixture Type Fixture Units (FU) Total Fixture Units

Sample using Table B

(Facility: School, Number of Students: 600, Fixture Count: Unknown)

600 students	X	0.30	=	180
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Number or persons, rooms, students, etc. Fixture Unit per Table B Estimated Fixture Units

Definitions

Fixture - Device in a plumbing system for the purpose of water delivery or drainage, i.e. source of water in a facility. See Table A for examples of Fixture Types.

Fixture Units – Load factor based on Fixture Type to determine heated water flow rate

Flow Rate (gpm) – The volume of fluid to be heated over a given period of time – i.e. gallons per minute of water

Hunter Curves (Flow Rate Curves) – Graphical representation for determining the approximate Flow Rate requirements for a facility based on the Fixture Units

Table B

Preliminary Hot-Water Fixture Estimate

Type of Building	Fixture Units
Hospital or Nursing Home	2.50 per bed
Hotel or Motel	2.50 per room
Office Building	.15 per person
Elementary School	.30 per student*
Junior and Senior High	.30 per student*
Apartment House	3.00 per apartment

*Plus shower load (in fixture units)

STEP 3

Determine the appropriate Flow Rate Curve (A, B, C, or D) for your facility:

Curve A: Restaurants

Curve B: Hospitals, Nursing Homes, Nurses Residences, Dormitories, Hotels, and Motels

Curve C: Apartments and Houses

Curve D: Office Buildings, Elementary and High Schools

STEP 4

Using your actual or estimated TOTAL FIXTURE UNIT number from Step 2, find your flow rate (gpm) requirement using the applicable Hunter Curve (Flow Rate Curve) below for your facility.

Note: Chart 1 is enlarged. Use Chart 2 for Fixture Units under 400.

Sample: Using Total Fixture Unit sample from Step 2 (Table A) and Curve D (determined from Step 3), the estimated total flow required (using Chart 2 below) is **16 gpm**.

CHART 1

Hunter Curve for determining Flow Rate Requirement

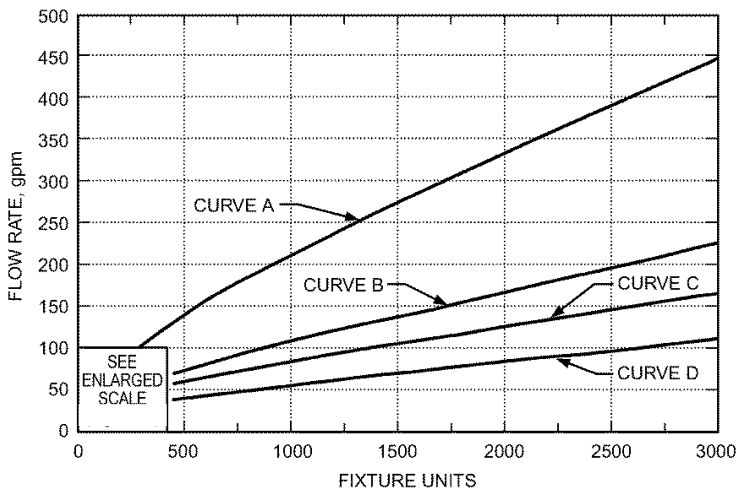


CHART 2

Enlarged scale of Chart 1

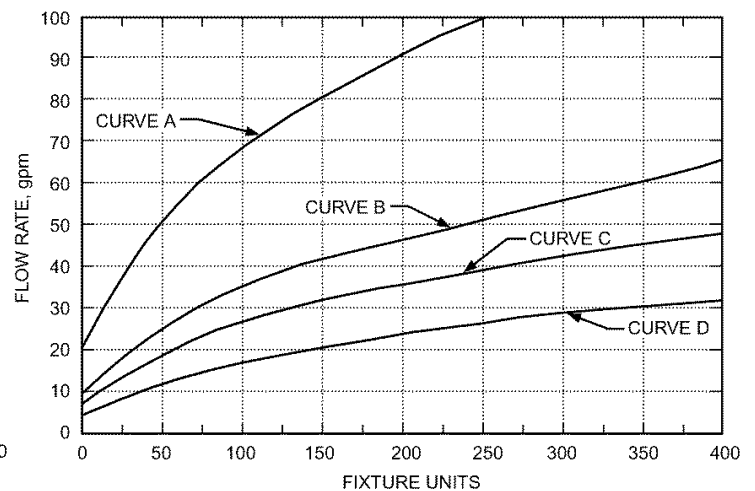


Table A

Hot Water Demand in Fixture Units (140° F)

Fixture Type	Apartments	Club	Gymnasium	Hospital	Hotels & Dormitories	Industrial Plant	Office Building	School	YMCA
Basin, private lavatory	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Basin, public lavatory	-	1	1	1	1	1	1	1	1
Bathtub	1.5	1.5	-	1.5	1.5	-	-	-	-
Dishwasher	1.5	-	-	-	-	-	-	-	-
Therapeutic bath	-	-	-	5	-	3	-	-	-
Kitchen sink	0.75	1.5	-	3	1.5	-	-	0.75	3
Pantry sink	-	2.5	-	2.5	2.5	2.5	-	2.5	2.5
Service sink	1.5	2.5	-	2.5	2.5	2.5	2.5	2.5	2.5
Shower	1.5	1.5	1.5	1.5	1.5	3.5	-	1.5	1.5
Circular wash sink	-	2.5	2.5	2.5	-	4	-	2.5	2.5
Semicircular wash sink	-	1.5	1.5	1.5	-	3	-	1.5	1.5

Note: Data predate modern low-flow fixtures and appliances

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Heat Miser RFQ Form

Date: _____



Instructions: Complete all information and fax to (610) 495-5134 or scan and email to Sales@WatsonMcDaniel.com.

Customer Information

Customer/Project: _____ Customer Location: _____

Sales Rep: _____ Quote Ref #/Name: _____

INTERNAL USE ONLY

I have reviewed all information and verify it is complete, accurate, and ready for factory quoting.

Signature: _____ Date: _____ RFQ Rev: _____

Potable Water Application

☐ Yes ☐ No

Service Requirements

☐ Existing Re-circ Loop ☐ Dead End Service

Sizing Conditions

Steam Supply Pressure: _____ psig
 Condensate Return Pressure: _____ psig
 Condensate Lift Height: _____ feet
 Waterside Flow Rate: _____ GPM
 Inlet Water Temperature: _____ ° F
 Outlet Water Temperature: _____ ° F
 Max Waterside Pressure & dP: _____ psi
 Air Pressure Available: _____ psig
 Max Available Steam: _____ psig
 Electrical Supply: _____ V ac

Package Options

☐ High Limit Package (Independent steam isolation)
☐ Other: _____

Testing & NDE (Non Destructive Examination)

☐ Visual Inspection w/ Leak Test (Standard)
☐ Hydro testing ☐ Other: _____

Size, Handling, and Shipping

Size Requirement: _____ "L x _____ "W x _____ "H
 Painting: ☐ Standard ☐ Other: _____
☐ Customer Supplied Product: _____
 Special Shipping Instructions: _____

Code of Construction

Vessels (check all that apply):

☐ None ☐ ASME Code Stamp ☐ CRN (Canada)
☐ Other: _____

Piping (check one):

☐ ASME B31.9 (Standard) ☐ Other: _____

Special Certifications: _____

Heat Exchanger Requirements

☐ 316 SS Plates, Single Wall w/ EPDM Gaskets (Std)
☐ 316 SS Plates, Double Wall w/ EPDM Gaskets
☐ Other: _____

Water Quality

Hardness: _____ PPM Chlorine: _____ PPM

Particle Size: _____

*Not required if hardness is <100ppm or chlorides are <150ppm @ 140 °F

Control Valve (Check all that apply)

Body Material:

☐ Standard (316 SS: ½" to 4")
☐ Other: _____

Actuator:

☐ Pneumatic (Std) ☐ Electric

Positioner:

☐ Electro-Pneumatic (Std) ☐ Pneumatic ☐ None

Materials of Construction and Class

Water Side Piping:

☐ 316 SS w/ SW connections & 150# FLG End Connections
☐ Other: _____

Steam & Condensate Side Piping:

☐ Steel Pipe & 150# Iron Fittings w/ NPT Connections
☐ Other: _____

Piping Schedule:

☐ 40
☐ Other: _____

Special Requirements:

☐ Piping: _____
☐ Fittings: _____
☐ Dual-Rated ASME/ASTM: _____
☐ Bolting/Gasket Material: _____
☐ Special Welding Req.: _____
☐ Other (explain): _____