

PROCESS HEATING SOLUTIONS WORLDWIDE



DIRECT  
STEAM  
INJECTION  
SYSTEMS

***pick***<sup>™</sup>  
*The Best*<sup>™</sup>



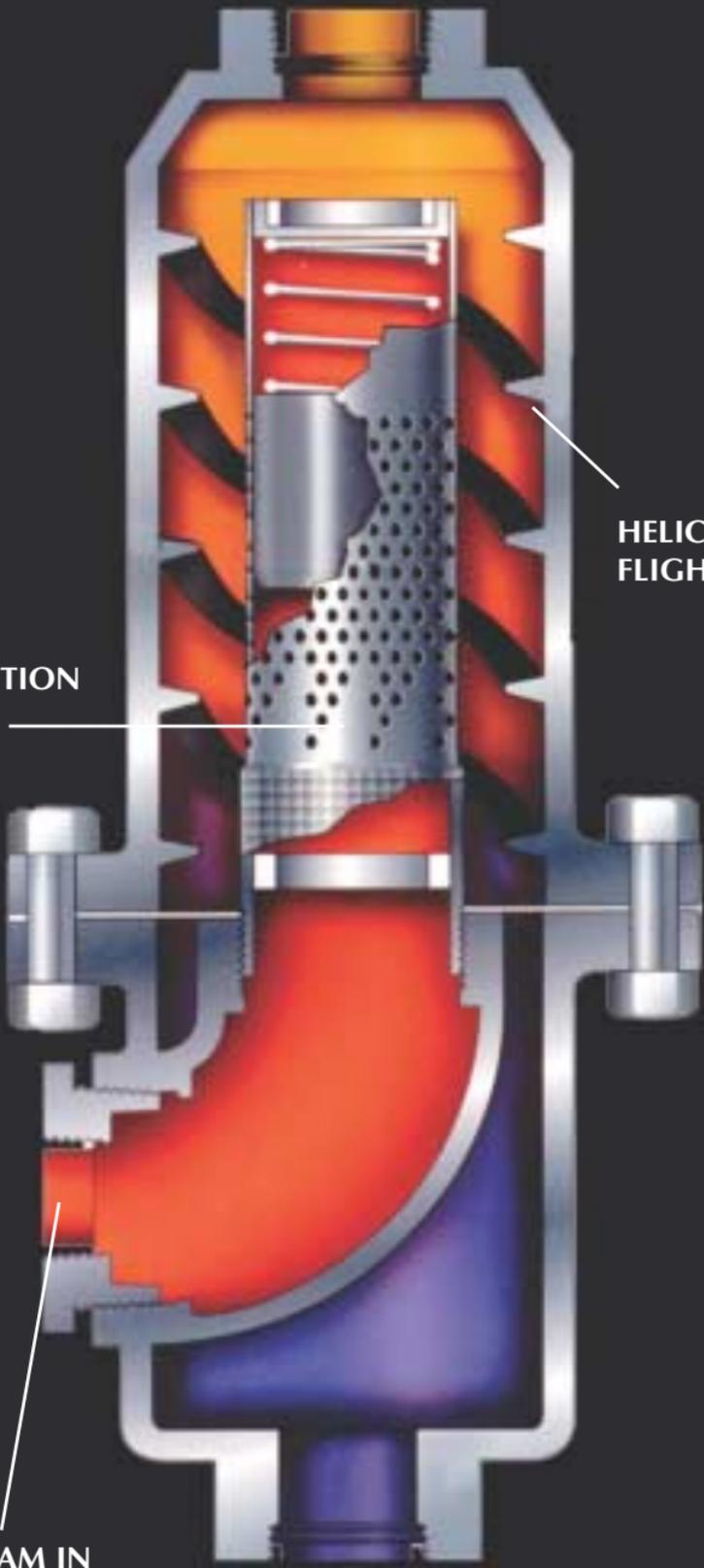
HEATED LIQUID  
OUT

HELICAL  
FLIGHTS

INJECTION  
TUBE

STEAM IN

UNHEATED  
LIQUID IN



# Pick DSI

## How It Works...

Pick Direct Steam Injection (DSI) Systems can be used to heat any water miscible liquid or aqueous slurry instantly on a continuous straight-through basis.

The Pick system injects steam into the liquid through hundreds of small orifices in the injection tube. Fine “bubbles” of steam are instantly absorbed by the liquid, resulting in 100% transfer of heat energy.

A unique spring-loaded piston rises or falls, as more or less steam is required. This prevents pressure equalization between steam and water pressure, thus eliminating steam hammer. Helical flights in the chamber promote thorough mixing prior to discharge.

## The heart of the Pick Heater is the steam injection tube and the spring-loaded piston.

They serve three critical functions:

- Breaks steam into small streams.
- Piston modulates in response to changes in steam demand to maintain a differential between steam and water pressure.
- Piston closes during shutdown to prevent sudden collapse of steam inside the tube.



These obvious advantages along with proven, dependable performance have made Pick DSI the process heating method of choice where accurate temperature control, rapid response and energy efficiency are important factors.

### ENERGY EFFICIENT

When compared with indirect shell and tube or plate and frame heat exchangers, Pick Heaters can cut fuel costs dramatically – up to 28% – because 100% of the available energy from the steam is absorbed by the liquid.

### EXCEPTIONAL TEMPERATURE CONTROL

Accurate temperature control throughout the entire operating range conserves energy and assures product quality. The Pick Heater adapts quickly to load changes and maintains precise temperature control to within 1°C or less in many systems.

### WIDE OPERATING RANGE

No other steam injection system can match our turndown ratio – 12:1 with a single control valve, better than 100:1 with multiple steam control valves.

### NO STEAM HAMMER

Unique variable orifice injector automatically maintains a minimum differential between the steam and water pressures. This eliminates harmful vibration and steam hammer.

### LOW NOISE LEVEL

The Pick Heater operates at a low noise level, normally below 85 dba, far superior to venturi-type heaters.

### LOW LIQUID PRESSURE DROP

Pressure drop does not exceed 2 PSI under normal flow rates.

### COMPLETE MIXING IN HEATER BODY

Eliminates need for straight run discharge piping after the heater required by venturi-type heaters.

### INSTANTANEOUS

Pick Heaters deliver an unlimited supply of hot water on demand, thus eliminating the need for large storage tanks.

### COMPACT DESIGN

When compared to conventional heat exchangers, Pick Heaters take up only a fraction of the space.

# Constant Flow

## What is a “Constant Flow” Heater?

The Pick Constant Flow Heater is used wherever a constant flow of heated liquid at precisely controlled temperatures is required. It is ideal when the water flow rate is fixed or varies over a narrow span (3:1), or where variations in flow are gradual, and on/off cycling does not occur. The Pick Constant Flow Heater is delivered as a complete, compact system and can be easily customized to meet your plant specifications.

## Applications

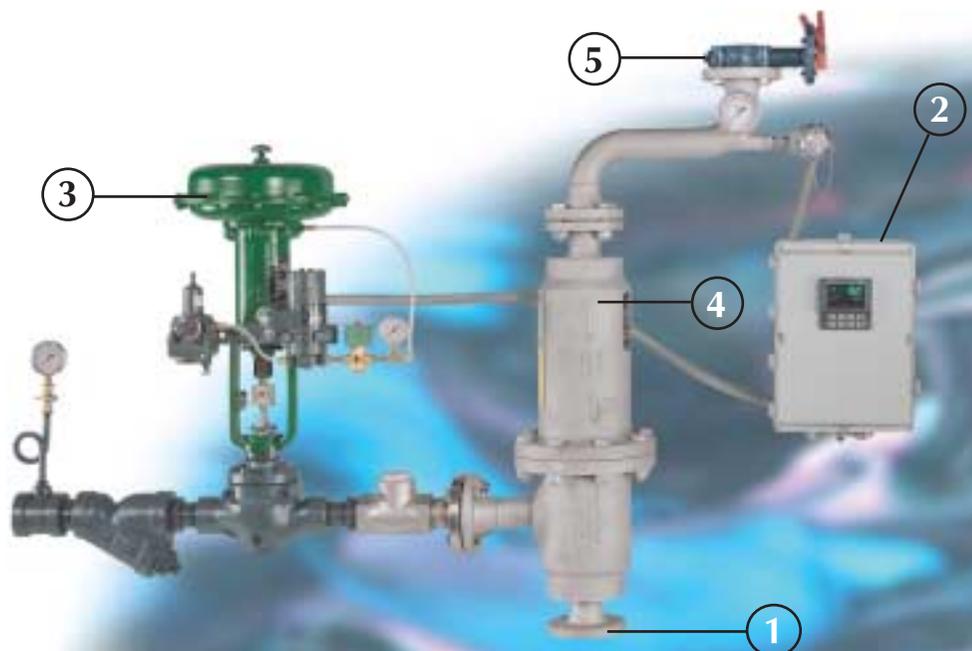
- Retorts
- Sterilization
- CIP
- Pasteurizers
- Jacketed Kettles
- Tank Filling
- Extruders
- Reactor Vessels
- Centrifuge or Filter Back Flush
- Tank Car Heating/Washing
- Slurries
- Liquid-to-Liquid Mixing
- Condensate Mixing
- Green Liquor Heating
- Felt Washing
- Tempered Water
- Boiler Feed Water
- Parts Washer
- Bio Kill
- Starch Cooking

## CONSTANT FLOW

Heater Model No.		6X7-3	6X10-3	6X25-3	6X50-3	6X75-3	6X100-3	6X150-3	6X200-3	6X350-3	6X500-3
Steam Flow Capacity	Lb/hr	700	1,250	2,500	5,000	7,500	10,000	15,000	20,000	35,000	50,000
	Kg/hr	320	565	1,130	2,260	3,390	4,520	6,780	9,040	15,820	22,600
Liquid Pipe Size Range (in.)	Threaded	1/2 -1 1/2	1-2	1 1/4-2 1/2	1 1/2-3	2-3	2 1/2-3	3	—	—	—
	Flanged	3/4-2	1-3	1 1/2-4	2-4	2-6	2 1/2-6	3-8	4-10	4-10	6-12

## How the Pick “Constant Flow” Heater Works:

1. Water (or water-miscible liquid) to be heated enters mixing chamber here.
2. Set controller to desired outlet temperature.
3. Modulating steam control valve, activated by the temperature controller, admits just enough steam to maintain the desired outlet temperature.
4. Steam and liquid mix thoroughly within the heater body.
5. Heated liquid outlet



# Variable Flow

## What is a “Variable Flow” Heater?

The Pick Variable Flow Heater is designed to deliver hot water at a precisely controlled temperature over a wide range of water flows. It is used to accommodate wide variations in demand and frequent start-stop applications, and is ideally suited as a central heating system for multiple use points such as wash down stations or plant sanitation.

## Applications

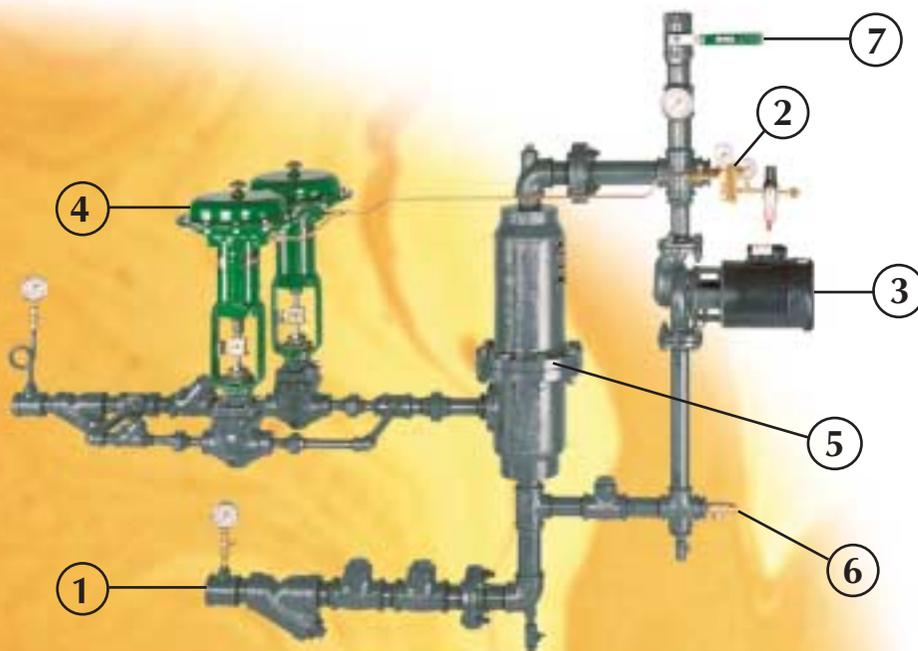
- Multiple Hose Stations
- Plant Sanitation
- Can Topping
- Can Washing
- Filter Back Flush
- Freezer Coil Defrosting
- Laundries
- Industrial Process Water

## What makes the Variable Flow Heater work?

The addition of a circulating pump provides accurate temperature control during periods of variable demand. During periods of low to moderate demand, the pump maintains adequate circulation through the heater and across the temperature controller probe to eliminate temperature swings. The result – hot water at a precisely controlled temperature on demand.

## VARIABLE FLOW

Heater Model No.		6X7	6X10	6X25	6X50	6X75	6X100	6X150	6X200	6X350
Steam Flow Capacity	Lb/hr	700	1,250	2,500	5,000	7,500	10,000	15,000	20,000	35,000
	Kg/hr	320	565	1,130	2,260	3,390	4,520	6,780	9,040	15,820
Liquid Pipe Size Range (in.)	Threaded	3/4 -1 1/2	1-2	1 1/4-2 1/2	1 1/2-3	2-3	2 1/2-3	3	—	—
	Flanged Class 125	—	—	—	—	4	4	4-6	4-8	4-8



## How the Pick “Variable Flow” Heater Works:

1. Water to be heated enters mixing chamber here.
2. Set controller to desired set point.
3. Pump circulates water within the system to prevent stratification during low-flow conditions or intermittent use.
4. Modulating steam control valves, activated by the temperature controller, admits just enough steam to maintain the desired outlet temperature.
5. Steam and liquid mix thoroughly within the heater body.
6. During idle mode (no demand) the relief valve helps maintain set point temperature.
7. Heated liquid outlet.

# Custom Systems



## Applications

- CIP Systems
- Jacketed Heating
- Washdown Stations
- Tank Car Washing
- Biowaste Inactivation

*Pick*  
Custom Design™



## Packaged Systems

Pick Pre-Packaged Hot Water Sets are custom designed to meet process industry needs effectively and efficiently. From a pilot project to large-scale production, Pick components are integrated to meet the requirements for heating jacketed reactors and kettles, liquid-to-liquid exchangers, rotary vacuum dryers and blenders, plate heat exchangers, pasteurizers, CIP systems and other heat transfer applications.

- Pre-engineered skids, wall mounts or floor mounts available to meet your specific requirements
- Compact design can fit most customer space constraints
- Fully assembled and ready for operation (includes circulation pump, complete valving, controls and instrumentation in a skid-mounted package)
- Pilot Scale and Production Systems

## Custom Designed Systems

Pick Custom Design (PCD) is a division of Pick Heaters dedicated to providing packaged solutions for indirect process heating applications. PCD combines years of heat transfer experience with Pick's proven packaging capabilities. Using indirect methods of heating such as shell-and-tube or plate heat exchangers, Pick can design a custom skid to meet your process requirements. With PCD you can expect the same quality and performance you've come to expect from Pick Heaters for more than 60 years.

## Fabricated Designs

Pick Fabricated Design offers the same features and benefits of our standard models, regardless of size and flow rates. These unique, customized heaters can accommodate flow rates well beyond the norm – up to 25,000 gallons per minute. They also have the ability to conform to existing piping – from 2 inches to 32 inches in diameter and beyond. High-pressure applications, e.g. 900 psi, requiring Ansi Class 1500 flanges are no problem.

## Applications

- Wastewater Treatment
- Reactor Heating/Cooling
- Pellet Water Heating
- Alumina Slurry
- Condensate Mixing
- Heating White Water





## Food Processing

The special challenges of the food industry are perfect for Pick direct steam injection technology. Throughout the food plant, from process heating to plant sanitation, Pick provides instant, unlimited hot water at a precise temperature. Better yet, compared to indirect heat exchangers, Pick can cut energy costs as much as 28%...without the maintenance and operational headaches. And they're so compact that a Pick Heater can be installed virtually anywhere in the plant.

Pick Direct Injection Heaters have proven themselves throughout the food industry, and in a variety of plant applications including:

- Multiple Hose Stations
- Plant Sanitation
- Heating Jacketed Kettles
- Retort Cooking
- Atmospheric Cooking
- Pasteurizing
- Can/Bottle Washing
- Can Topping
- Can Warming
- CIP
- Blanching
- Coil Defrosting



Pick Sanitary Heaters are 3A certified, and perfect for direct heating of many food products



## General Industrial Applications

The truth is, Pick Heaters can be used in virtually any industrial application that requires unlimited hot water...instantly and economically. You'll find Pick Heaters at work around the world, in every kind of industrial environment, being used for operations such as:

- Multiple Hose Stations
- Tank Car Cleaning
- CIP Systems
- Boiler Feedwater Heating
- Wastewater Treatment
- Industrial Laundries
- Parts Washer
- Ready Mix Concrete
- Dye Beck Heating
- Washbox Heating

## Chemical and Pharmaceutical Processing

In no other industry is precise control of process temperature more critical. Pick Heaters provide the perfect answer! In jacketed heating applications, Pick can replace troublesome steam heating with hot water because its unique method of operation controls water temperature to within 1°C, thus eliminating hot spots and uneven heat distribution. Easily adapted to cascade temperature control, the Pick Heater can be automated to a full cycle of heating and cooling. No matter the application, Pick's precise temperature control and immediate response to changes in process conditions mean an improved and more consistent product. Offering lower energy consumption and reduced maintenance costs, Pick is the perfect solution to all your processing needs.



Applications in the chemical industry include:

- Batch Fill
- Heating Reactor Vessels
- Process Water
- CIP
- Condensate Mixing
- Process Water
- Deionized Water
- Filter and Centrifuge Back Flush
- Gas to Liquid Dispersion

## Pulp and Paper Processing

In these demanding environments, Pick's quiet, compact design and exceptional economics have proven Pick Heaters throughout the world. Cutting fuel costs as much as 30% compared to heat exchangers, these durable heaters provide an unlimited supply of hot water with no vibration or steam hammer. Plus, they'll operate 24/7 with minimal routine maintenance!

In the pulp and paper industries, Pick Heaters enhance process efficiency and decrease operating costs in applications that include:

- Starch Cooking
- De-inking
- Liquor Heating
- Brown Stock Washers
- Heating White Water
- Mud Filter Washers
- Filling Pulpers
- Wire and Felt Washing
- Machine Boil Out
- Calender Roll Heating



# Pick Heaters.

## The First, and Still the Best.

In 1945, Pick Heaters developed and patented a unique concept of direct steam injection heating. It was the first step in what was to become a continuous flow of refinements and innovation. Today, the originator is still the leader. While imitators have surfaced, no one has duplicated Pick's unique combination of simple design, compact size, maintenance-free performance, and incredible energy efficiency. Plus, we remain the only company 100% dedicated to designing and manufacturing direct steam injection heaters.

## The Right Products.

Our products continue to evolve as we develop new technologies to meet the changing needs of the markets we serve. For example, Pick's line now includes 3A certified sanitary heaters, remarkably efficient variable flow systems, even complete "packaged" systems tailor-engineered to customers' unique requirements.

## The Best People.

Combine this with the knowledge and dedication of Pick's people, and your choice is simple. We're committed to providing the best customer support before and after the sale with a team of factory sales engineers that is the most knowledgeable in the industry. They're ready to put that expertise to work for you.

## A Global Presence.

Pick is there when you need us, with factory trained representatives throughout North and South America as well as in Europe and the Far East. That means you get technically competent consultation on your needs, plus quickly accessible service after the sale...no matter where you call home.



P.O. Box 516, 730 South Indiana Avenue,  
West Bend, WI 53095  
**800.233.9030 or 262.338.1191**  
**FAX 262.338.8489**  
E-mail: [info1@pickheaters.com](mailto:info1@pickheaters.com)  
[www.pickheaters.com](http://www.pickheaters.com)