

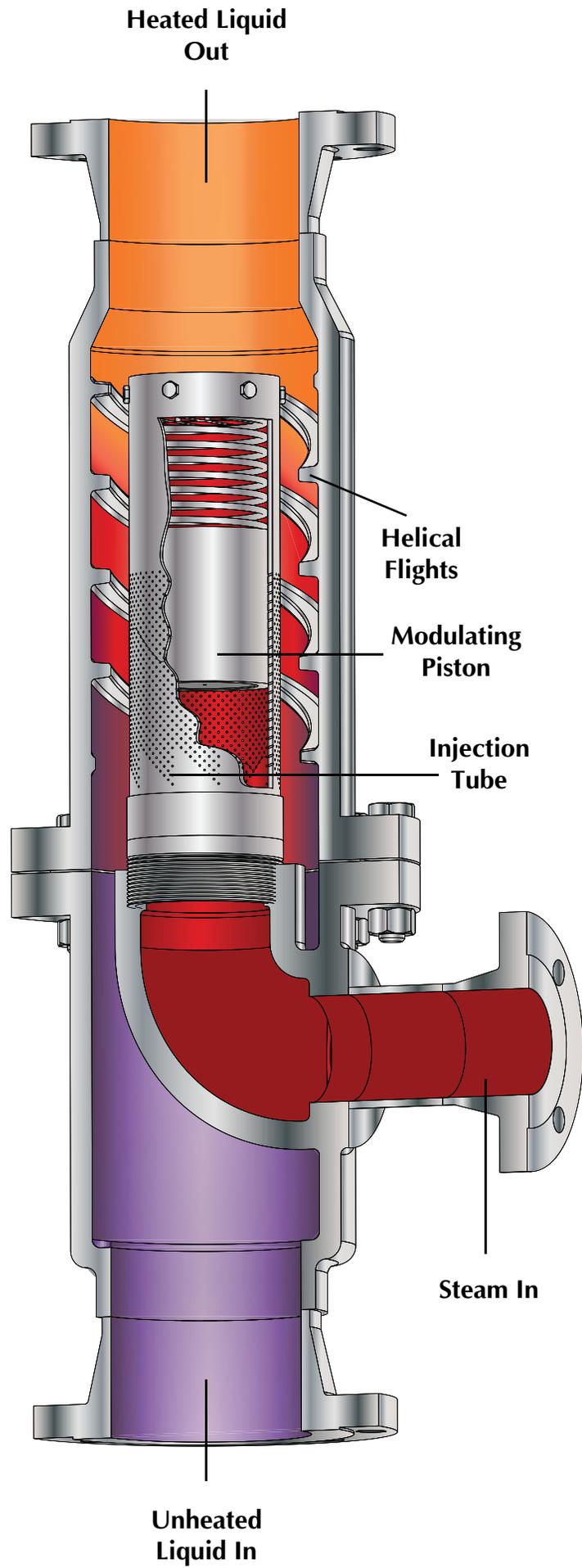
SUPERIOR PERFORMANCE BY DESIGN



***pick***<sup>®</sup>  
*heaters inc.*

**DIRECT STEAM  
INJECTION SYSTEMS**





# Pick DSI

## How It Works...

Direct Steam Injection Heaters can be used wherever medium- to high-pressure steam is available and an unlimited supply of industrial hot water is needed, or to heat liquids or slurries in-line.

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% heat transfer and accurate temperature control.

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.

**Our method of injection sets Pick apart from all other Direct Steam Heaters. The injection tube and spring-loaded piston form the heart of the Pick Heater, which serves three critical functions:**

- Holes diffuse 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 advantages, along with proven and dependable performance, have made Pick DSI the process heating method of choice wherever accurate temperature control, rapid response and energy efficiency are required.

## ENERGY EFFICIENT

When compared with indirect heating methods such as shell-and-tube or plate-and-frame heat exchangers, as well as inefficient direct methods such as tank steam sparging, Pick Heaters can cut fuel costs dramatically – up to 28% – because 100% of the available energy from the steam is instantly absorbed by the liquid.

## EXCEPTIONAL TEMPERATURE CONTROL

Because the Pick Heater adapts quickly to load changes, precise temperature control is maintained to within 1°C. Accurate temperature control throughout the entire operating range conserves energy and assures product quality.

## WIDE OPERATING RANGE

No other steam injection system can match our turndown ratio – 12:1 with a single control valve, up to 100:1 with dual 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 or choke-flow type heaters.

## LOW LIQUID PRESSURE DROP

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

## COMPLETE MIXING IN HEATER BODY

The mixing process happens completely within the heater body, eliminating the need for straight-run discharge piping required by venturi-type heating systems.

## NO STORAGE TANKS

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

## COMPACT DESIGN

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



# Constant Flow Design

## What is a “Constant Flow” Heater?

The Pick Constant Flow Heater is used wherever a constant flow of heated liquid at precisely controlled temperature is required. It is ideal when the water flow rate is fixed or varies over a narrow span (3:1) turndown. The Pick Constant Flow Heater is delivered as a complete, compact system and can be easily customized with additional controls, valves and instrumentation to meet your plant specifications.

For water flow turndown beyond 3:1 or rapid start-stop cycling applications, please refer to our Variable Flow design (see page 3).

## Where is it used?

- Sterilization
- CIP
- Pasteurizers
- Jacketed Kettles
- Tank Filling
- Extruders
- Reactor Vessels
- Centrifuge or Filter Back Flush
- Tank Car Heating/Washing
- Slurries
- Condensate Mixing
- Green Liquor Heating
- Felt Washing
- Tempered Water
- Boiler Feed Water
- Parts Washer
- Biowaste Inactivation

## CF HEATER CAPACITIES

Model Number		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 - 3	2 - 4	2 - 4	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 exits through the outlet.



# Variable Flow Design

## What is a “Variable Flow” Heater?

The Pick Variable Flow Heater is designed to deliver instant hot water at a precisely controlled temperature over a wide range of water flows. It is used for frequent start-stop applications, and is ideally suited as a central heating system for multiple use points such as wash-down hose stations. Standard systems can handle 12:1 water flow turndown, or can be designed with dual control valves for up to 100:1 water flow turndown.

## 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 is instantaneous hot water at a precisely controlled temperature, on demand.

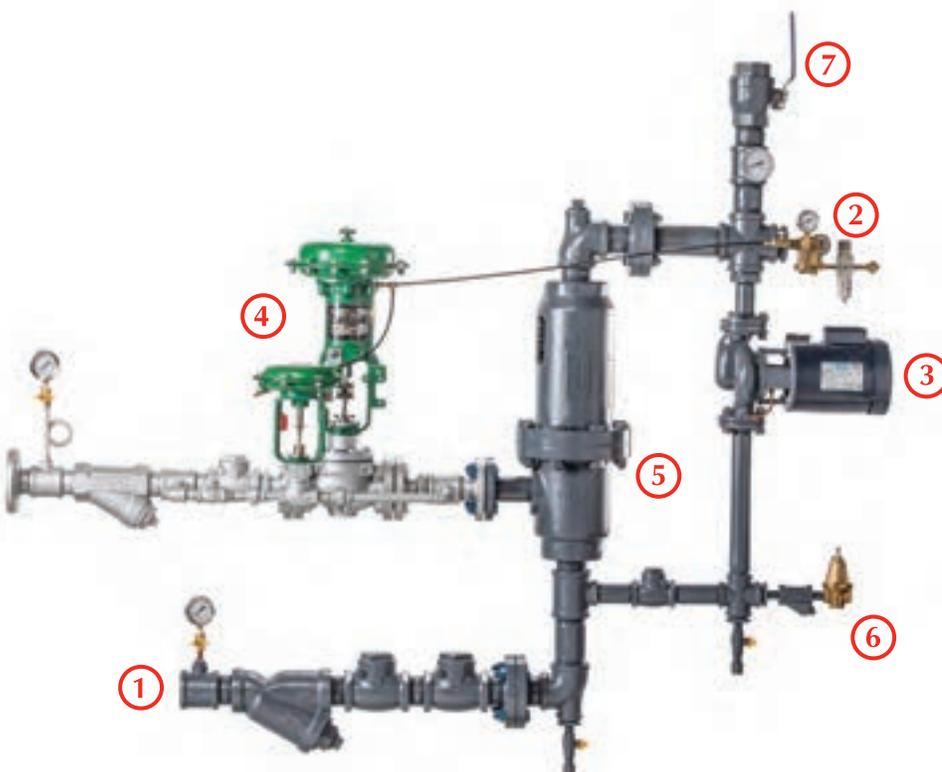
## Where is it used?

- Multiple Hose Stations
- Can Topping
- Can Washing
- Filter Back Flush
- Freezer Coil Defrosting
- Industrial Process Water
- Tank Filling

## VF HEATER CAPACITIES

Model Number		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	$\frac{3}{4}$ - $1\frac{1}{2}$	1 - 2	$1\frac{1}{4}$ - $2\frac{1}{2}$	$1\frac{1}{2}$ - 3	2 - 3	$2\frac{1}{2}$ - 3	3	--	--
	Flanged	--	--	--	--	4	4	4 - 6	4 - 8	4 - 8

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



1. Water to be heated enters the system here.
2. Adjust 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 valve(s), activated by the temperature controller, admit 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 exits through the outlet.

# Custom Designs

## Packaged Systems



Pick Packaged Hot Water Systems are custom-designed to meet process industry needs effectively and efficiently. Within a range of applications from pilot projects to large-scale production, Pick components can be integrated to meet the requirements of heating jacketed reactors and kettles, rotary vacuum dryers, plate heat exchangers, CIP systems and other heat transfer applications.

- Pre-engineered skids in pilot scale and full production scale, using wall mounts or floor mounts, are available to meet your specific requirements.
- Compact design can fit within most customer space constraints.
- Systems are fully assembled and ready for operation (can include circulation pump, complete valving, controls and instrumentation in a skid-mounted package).
- Pick Custom Design (PCD) Systems incorporate various methods of heat transfer, include ancillary components for a complete skid or frame package, and are ready for customer final installation and start-up.

## Fabricated Designs

Pick Fabricated Designs offer the same features and benefits of our standard models, regardless of size or material of construction (e.g. Duplex 2205, Hastelloy, Titanium, etc.). These unique, customized heaters can accommodate flow rates well beyond the norm – up to 25,000 GPM (5680 M<sup>3</sup>/hr). 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) or requirements such as DN or ANSI flanges can easily be handled by our fabricated designs.



## BX Slurry Heater

A Pick BX Heater provides instantaneous and complete cooking of starch and other water-miscible slurries. It is proven effective on pearl, modified, and cationic starches with solids concentrations up to 35% and cooking temperatures ranging from 90°C – 150°C.

The BX Heater is also a great choice for viscous slurries such as waste grease and oil. Heating with a Pick BX efficiently reduces the viscosity to promote separation of components at the centrifuge.

The unique design of the Pick BX Heater offers key advantages over other high-velocity venturi devices and indirect heat exchangers, such as low pressure drop, low noise level, non-shearing, and low velocity mixing. This ensures thorough heating/cooking.

# SC Sanitary Design

## How It Works...

Pick SC Sanitary Direct Steam Injection System can be used to heat/cook any water-miscible liquid or slurry instantly on a continuous, straight-through basis. It can also handle pumpable slurries containing bite-size pieces such as salsas or stews.

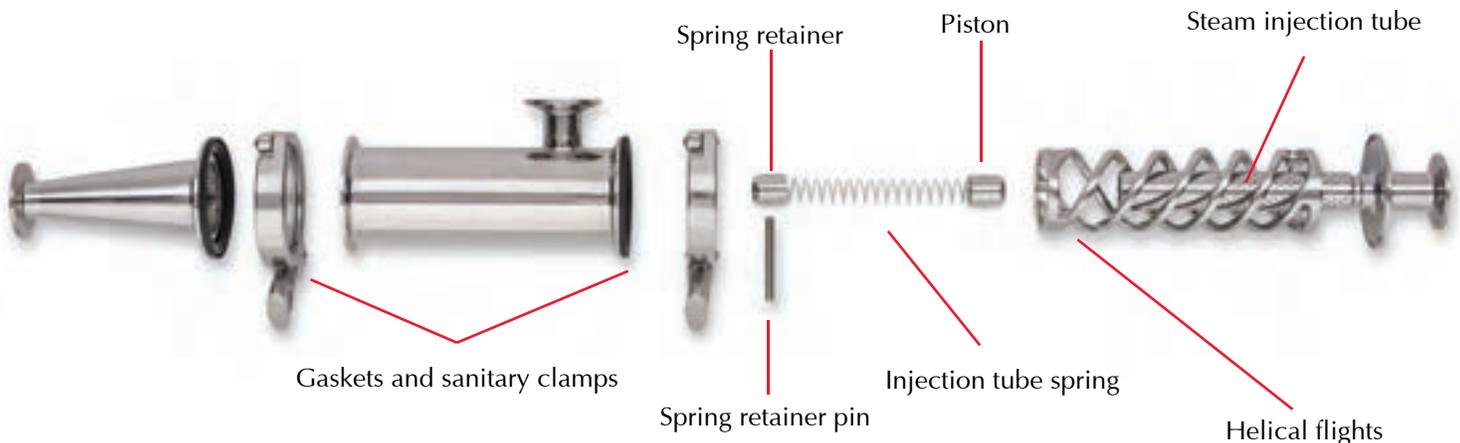
The Pick Sanitary Heater is the only DSI system that achieves instant set point temperatures and provides thorough cooking of products like starches. Intimate and gentle blending of steam and product are ensured by the system's unique, low-velocity, variable orifice steam injector and helical flights. This eliminates the shear and product degradation commonly associated with sonic-velocity venturi systems.

The Pick System works by injecting steam into the product through hundreds of small orifices. Fine "bubbles" of steam are instantly absorbed by the product, resulting in 100% heat transfer. This eliminates the inherent process inefficiencies and maintenance headaches of traditional batch cooking. Pick Sanitary DSI Systems allow in-line heating, with precise temperature control and 100% energy efficiency.

Pick SC Sanitary DSI Systems are available with complete instrumentation as well as components to produce culinary steam.

## Sanitary Construction with 3-A Certification and Easy Disassembly for Cleaning

The Pick Sanitary Heater meets 3-A sanitary requirements for regulatory compliance with food and dairy applications. All product surfaces are 316L Stainless Steel with #4/Dairy (30 Ra) sanitary polish. Tri-clamp® connections are standard, and other connections are available upon request. The entire unit disassembles in seconds for routine inspection and cleaning.



# SC Sanitary Design

## Heat, Cook, Sterilize or Pasteurize Products In-line

### Food and Pharmaceutical Industries

Pick Sanitary DSI can be used in virtually any segment of the food and pharmaceutical industries that process liquids or slurries, including those containing bite-size pieces.

Common applications include:

- Baby Foods
- Soy Products
- Apple Sauce
- Cheese
- Beer
- Starch Candy
- Pie Fillings
- Rice Cereal
- Ketchup
- Puddings
- Salsa & Hot Sauce
- CIP Solutions
- Biowaste Inactivation

### CIP Systems

The Pick Sanitary DSI Heater can be piped directly into your CIP loop to instantly bring the process up to the required temperature. The system's 100% heat transfer reduces your energy costs, while its low-maintenance design helps keep your CIP system running trouble-free.

### SC HEATER CAPACITIES

Model Number		SC2	SC7	SC10	SC25	SC50	SC75	SC100
Steam Flow Capacity	Lb/hr	150	700	1,250	2,500	5,000	7,500	10,000
	Kg/hr	68	320	565	1,130	2,260	3,390	4,520
Liquid Minimum Port Size (in.)		1/2	1	1	1 1/2	2	3	3
Liquid Maximum Port Size (in.)		1 1/2	2	2 1/2	3	4	6	6

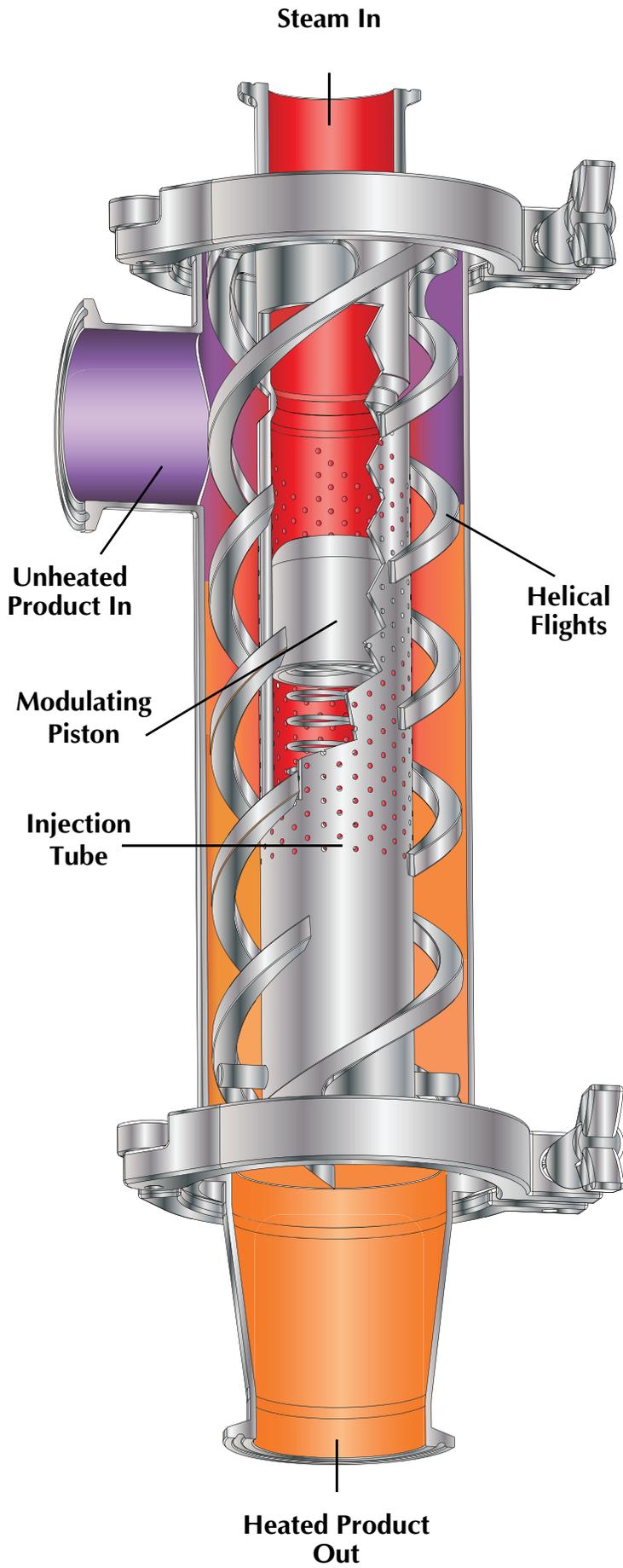
### How the Pick "SC" Sanitary Heater Works:



1. Liquid or slurry to be heated enters here.
2. Steam enters here.
3. Control valve regulates steam flow.
4. Steam and product mix thoroughly within the heater body.
5. Heated product outlet.
6. Temperature controller.
7. Optional separator & filter for culinary steam.

The Pick Sanitary DSI unit forms the heart of a complete yet simple system to heat, cook or sterilize. All components are provided by Pick, and components can be customized to precise customer needs.







## **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. Only Pick offers a unique combination of simple design, compact size, low maintenance, and incredible energy efficiency.

## **The Right Products**

Our products continue to evolve as we develop new technologies to meet the changing needs of the markets and applications we serve. In addition to our instantaneous and highly efficient industrial heaters we offer SC Sanitary Heaters, BX Slurry Heaters, Desuperheaters and complete Packaged Systems tailor-engineered to customers' unique requirements.

## **The Best People**

Combine this with the knowledge, experience 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 are recognized experts 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 the highest caliber technical consultation on your needs, plus quickly accessible service after the sale...no matter where you call home.



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