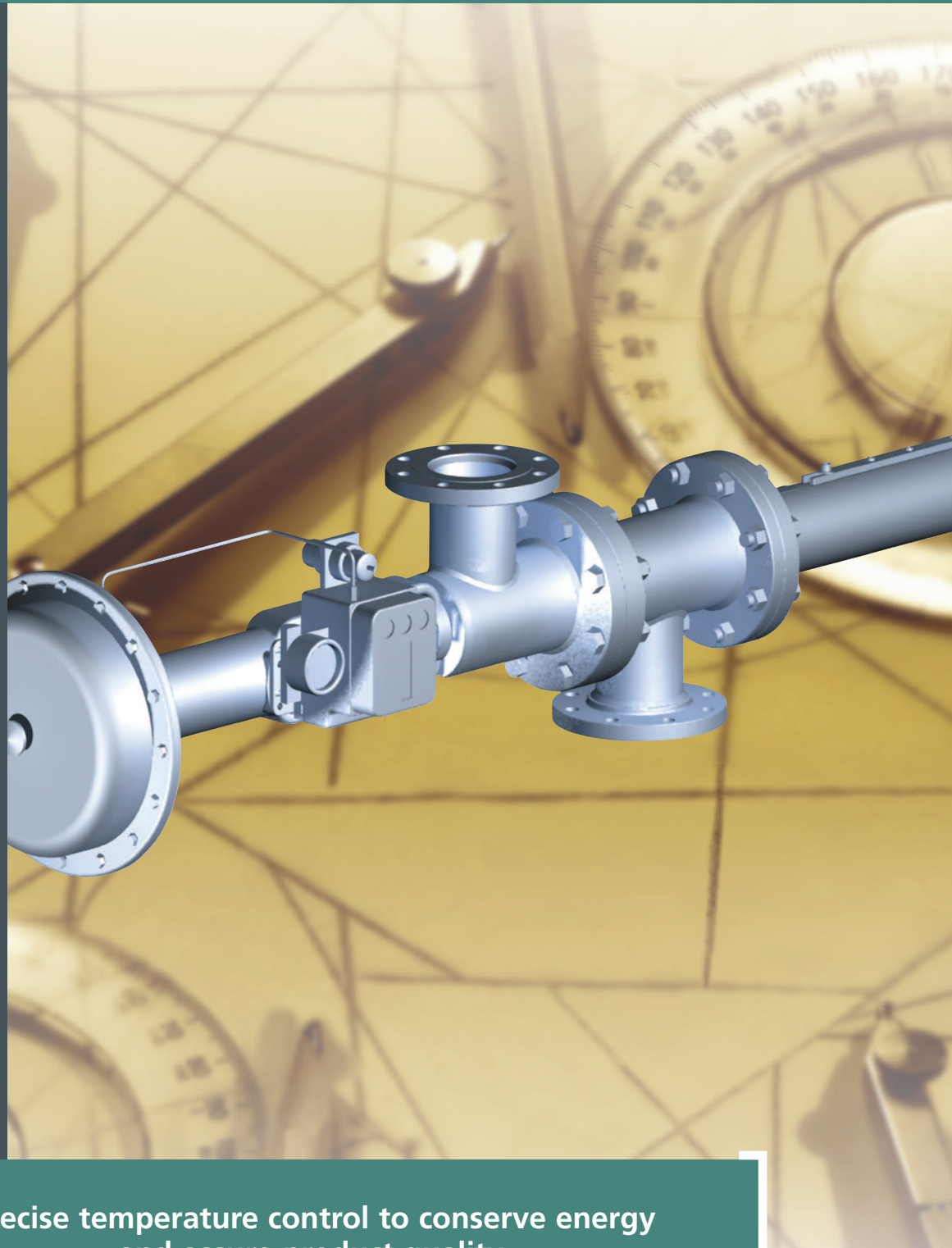


Direct Steam Injection Heater

Accurate temperature control

KADANT

Heat water rapidly,
accurately, and
efficiently.



Precise temperature control to conserve energy
and assure product quality.

Direct Steam Injection Heaters

Kadant Johnson direct steam injection heaters are designed to provide a cost-effective method to heat water and other fluids by injecting steam directly into the fluid. The direct injection heater is designed to handle a wide range of flow rates and deliver hot water or other fluids at precise temperatures.

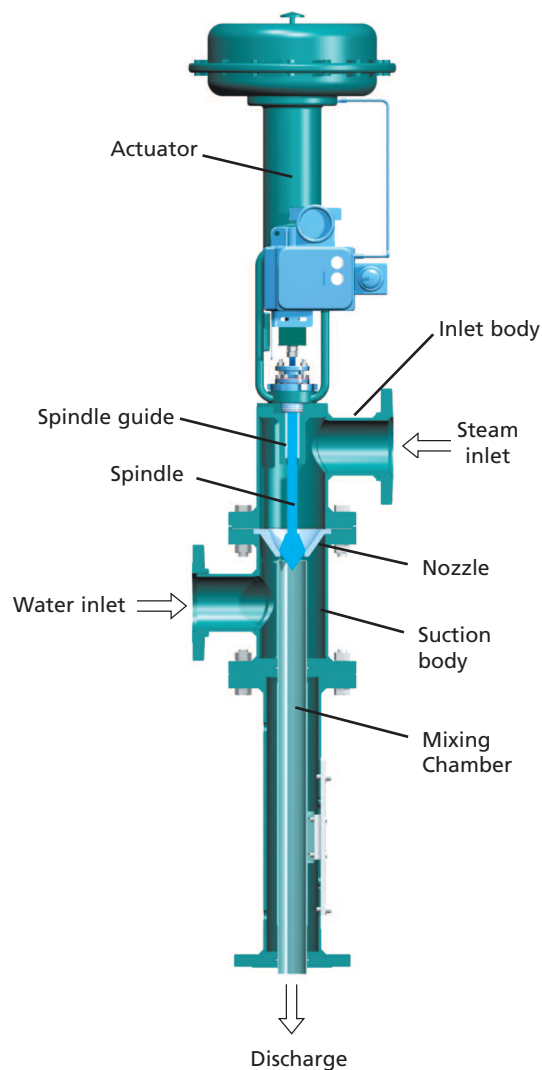
Direct steam injection heaters create an efficient use of all the heat in the steam, including both latent heat and sensible heat.

How direct steam injection heaters work

High-pressure steam enters the heater through the inlet body and passes into the nozzle. As the steam passes through the nozzle, the pressure drops and the velocity increases. This velocity will increase until it reaches sonic velocity in the nozzle orifice.

The high-velocity steam leaves the nozzle and goes into the suction body where it entrains the water. The steam and the water then enter the mixing chamber, where the steam jet transfers energy to the low-pressure fluid stream.

As the flows mix, the steam condenses and the water absorbs the latent and sensible heat as well as the kinetic energy in the steam jet. All of the steam is condensed in the water stream before the mixture exits the mixing chamber and passes into the process piping.

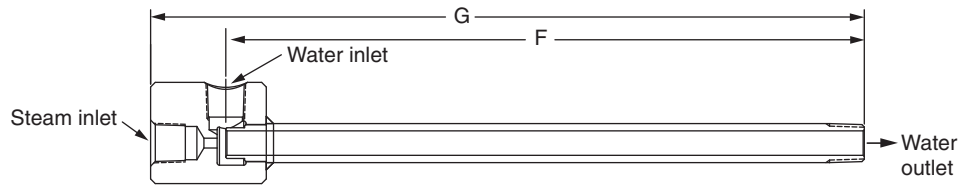


Features

- ▶ Precise temperature control
- ▶ Instant hot water or other fluid
- ▶ Large turn-down ratio
- ▶ Low vibration and low noise level

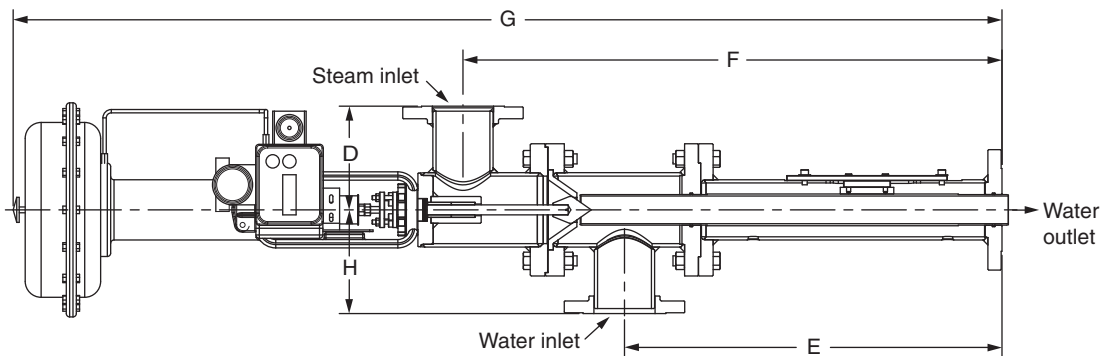
Benefits

- ▶ Improved process reliability
- ▶ Enhanced process flexibility
- ▶ High-efficiency energy utilization
- ▶ Low maintenance costs



Fixed jet direct steam injection heater

Size	Steam Connection	Water Connection	Outlet Connection	F	G	Units
3/8"	0.375"	0.375"	0.375"	6.42	7.72	inches
				163	196	mm
1/2"	0.50"	0.50"	0.50"	8.24	9.89	inches
				209	251	mm
3/4"	0.75"	0.75"	0.75"	11.22	12.97	inches
				285	329	mm
1"	1.00"	1.00"	1.00"	14.42	16.57	inches
				366	421	mm
1 1/4"	1.25"	1.25"	1.25"	19.26	21.61	inches
				489	549	mm
1 1/2"	1.50"	1.50"	1.50"	22.66	25.11	inches
				576	638	mm

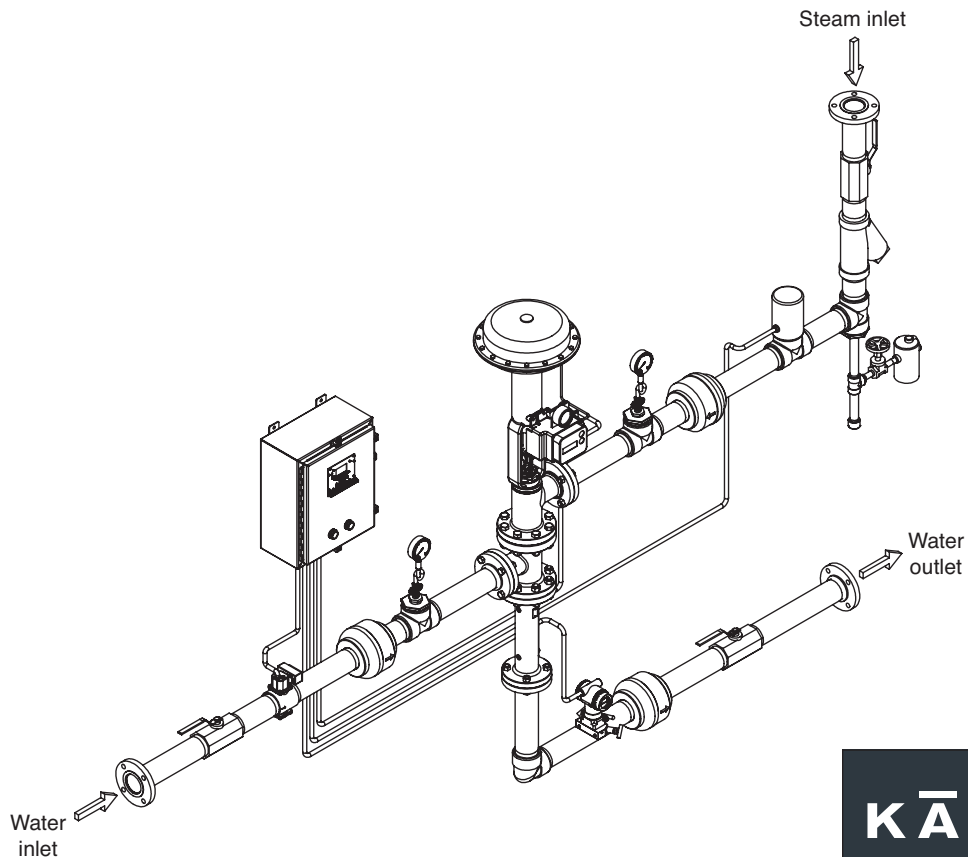


Variable jet direct steam injection heater

Size	Steam Connection Flange	Water Connection Flange	Outlet Connection Flange	D	E	F	G	H	Units
1 1/4"	1.25"	1.25"	1.25"	4.88	8.19	14.34	35.39	4.88	inches
				124	208	364	899	124	mm
1 1/2"	1.5"	1.5"	1.5"	4.88	10.29	16.43	37.48	4.88	inches
				124	261	417	952	124	mm
2"	2.0"	2.0"	2.0"	5.38	13.56	22.57	44.89	5.38	inches
				137	344	573	1140	137	mm
2 1/2"	2.5"	2.5"	2.5"	5.38	14.15	23.16	45.48	5.38	inches
				137	359	588	1155	137	mm
3"	3.0"	3.0"	3.0"	6.44	21.65	32.16	66.64	6.44	inches
				163	550	817	1693	163	mm
4"	4.0"	4.0"	4.0"	7.75	28.21	40.28	74.23	7.75	inches
				197	717	1023	1886	197	mm
5"	5.0"	5.0"	5.0"	8.38	33.75	46.22	81.02	8.38	inches
				213	857	1174	2058	213	mm
6"	6.0"	6.0"	6.0"	8.38	42.15	55.12	90.08	8.38	inches
				213	1071	1400	2288	213	mm

Direct steam injection heaters are custom-engineered and dimensions provided above are for reference only. Dimensions subject to change without notice.

Typical piping schematic showing direct steam injection heater and controls



Direct steam injection heaters replace fluid heating systems that use shell and tube heat exchangers, steam traps, and condensate pumps. This eliminates tube bundle fouling and cleaning and replaces it with a high-efficiency system in a small installed space envelope. The direct injection heater is also used to replace sparge pipes for tank heating.

Direct steam injection heaters can be applied wherever hot water is needed and steam is available to heat the water. Typical applications where direct steam injection heaters can be applied:

- ▶ Boiler feed water
- ▶ Wash down/hose stations
- ▶ Shower water systems
- ▶ Pulp stock/biomass pretreatment
- ▶ Commercial dishwashers
- ▶ Cleaning stations
- ▶ Heating reactor vessels
- ▶ Filter washing
- ▶ Jacketed kettles
- ▶ Wastewater treatment
- ▶ Industrial laundry
- ▶ Ethanol production

KADANT

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