



INS6 and INS10

Direct Steam Injection Heating Systems

A complete system for boiler feedtank, hot water storage and other industrial process heating requirements.

- Principal features:**
- Stainless steel injector for long life
 - Simple installation
 - Self-acting system requiring no external power supply
 - Efficient and economic heating
 - Single seated valve giving tight shut-off

General description

Spirax Sarco INS direct steam injection heating systems are designed to inject steam into tanks of water or process liquor to ensure quiet and efficient heating of the tank contents. The injector draws in cold liquid, mixes it with steam within the injector nozzle and distributes the hot liquid throughout the tank. In many applications the circulation induced by the injector is an advantage ensuring thorough mixing and avoiding temperature stratification.

Available system types

INS6 and INS10, screwed BSP (BS 21 parallel) or NPT. The injectors are for horizontal installation. The selection of a system depends on the flowrate of steam required to heat the tank contents and the steam supply pressure to the correct valve.

Boiler feedtank applications

Oxygen must be removed from boiler water if corrosion is to be prevented. Oxygen can be removed in two ways, either by the use of oxygen scavenging chemicals or by thermal deaeration.

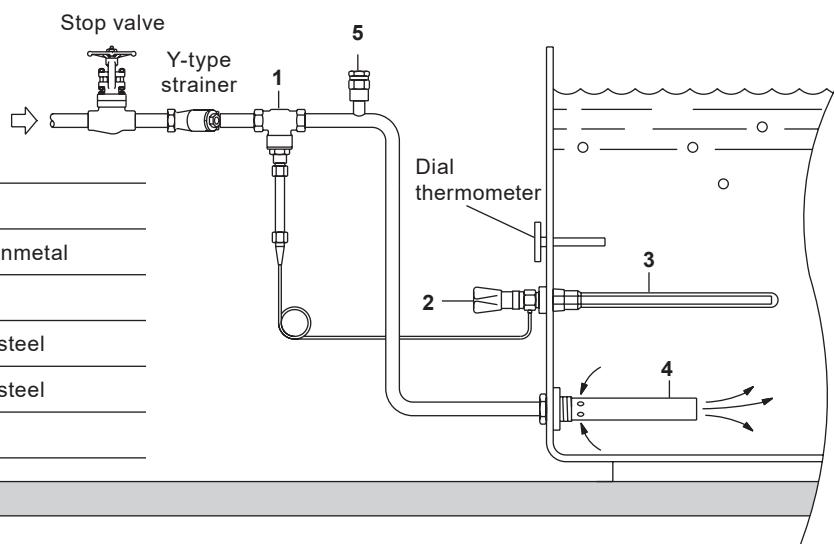
The dissolved oxygen content of water:

- At 20 °C is 9 ppm
- At 60 °C is 5 ppm
- At 90 °C is just under 2 ppm.

By heating the boiler feedwater typically to 85 - 90 °C to remove most of the oxygen, and using oxygen scavenging chemicals, the use of chemicals can be reduced by up to 75%. Additionally, boiler efficiency may be increased since blowdown requirements may be lowered. The fitting of a dial thermometer on the tank is recommended and is available from Spirax Sarco.

System components

No.	Part	Material
1	Control valve	Bronze/gunmetal
2	Controller and sensor	Brass
3	Sensor pocket	Stainless steel
4	Injector	Stainless steel
5	Vacuum breaker	Brass



Capacities

System capacities in kg/h of injected steam when heating tanks vented to atmospheric pressure.

System type		INS6	INS10
Control valve size		½" BSP with 6 mm orifice	½" BSP
Steam supply pressure		Capacities in kg/h of saturated steam	
bar g	psi g		
2	29	47	82
3	44	63	110
4	58	78	140
5	73	94	168
6	87	109	195
7	102	125	223
8	116	142	236
9	131	155	282
10	145	171	310
11	160	186	338
12	174	201	365
13	189	218	393

Where steam supply pressures are higher consider the use of a pressure reducing valve or alternatively, the use of a combined pressure reducing and temperature control valve. Please consult Spirax Sarco for a suitable type.

Equipment details

Note: All equipment is available screwed BSP or NPT.

System type	Control valve*	Controller type	Range	Sensor pocket	Steam injector	Vacuum breaker
INS6	BX6 ½"	SA128 with 2 m capillary	Range 1 -20 to 110 °C	Stainless steel - 1" to suit SA128	1 x IN15 ½" female x 1" male	VB14 - ½"
INS10	SB				2 x IN15 ½" female x 1" male	

* BX6 and SB control valves are bronze, single seat, normally open, direct acting.

A Y-type strainer is recommended upstream of the control valve. The Y-type strainer should normally be the same size as the steam supply pipeline. Consider a Spirax Sarco brass/bronze Fig 12 strainer.

An isolating valve is recommended upstream of the Y-type strainer. Consider the use of an M10 Spirax Sarco carbon steel ball valve or a HV3 bronze stop valve.

Safety information, installation and maintenance

This document does not contain sufficient information to install the system safely. See the relevant Installation and Maintenance Instructions supplied with system components.

Safety note: Your attention is drawn to Safety Information Leaflet IM-GCM-10.

Installation note: Spirax Sarco direct steam injection heating systems are designed to operate with the minimum of noise provided the installation is correct.

How to order

Example: 1 off Spirax Sarco INS6, ½" screwed BSP, direct steam injection heating system.