

# INS Steam Injector Systems

## System Components

No.	Part
1	Isolation valve
2	Y-type strainer
3	Control valve
4	Controller and sensor
5	Sensor well
6	Vacuum breaker
7	Injector

## Installation

IN25 and IN40 injectors are designed to be screwed to steam supply pipework which can run inside or outside the tank. They are supplied complete with 2 x 5/16 A/F hexagon locking screws. The IN15 can be fitted directly to a tank through a female threaded connection, or screwed to the pipework. We strongly advise the use of schedule 80 pipework, particularly when a male thread is to be cut. The injectors should be installed in line with the recommendations overleaf. The strainer should be installed on its side to prevent a water pocket from forming. The sensor well should be installed approximately one third of the way up the tank. For efficient and economic heating of the tank contents it is essential that the sensor measures a representative temperature. Ideally, the sensor well should be located above or above and to one side of the injector(s). The pocket should also be filled with a heat conducting paste. For boiler feedtank applications the sensor well must be kept well away from cold make-up, condensate return and flash steam pipework.

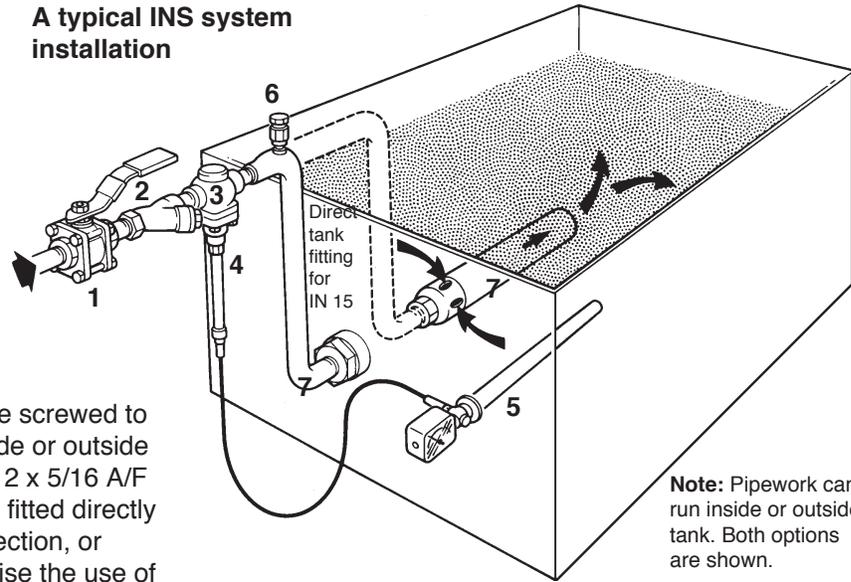
## Pipeline Sizing

The piping between the steam supply control valve and the injector(s) should be sized as follows:

Injector type	Minimum pipe size
Single injector IN15	1/2"
Two injectors IN15	3/4"
Single injector IN25	1"
Single injector IN40	1-1/2"
Two injectors IN40	2-1/2"
Three injectors IN40	3"

The piping feeding the injector system should be sized in line with standard practice.

A typical INS system installation



## Start-up

Decide upon the required set temperature of the controller. Initially, it is advisable to set to a slightly lower temperature, gradually increasing to the required control point. For a boiler feedtank application the set point will be in the range 175°-195°F (80-90°C). After the tank has reached a steady state condition the actual temperature of the tank contents should be compared with the controller setting. If they differ the scale should be re-set.

## Maintenance

The system itself requires no special or regular maintenance. Where a strainer is fitted it may need cleaning. The controller calibration should be checked periodically. We recommend an annual inspection for the steam supply pipework and the injector(s) to check that all fittings are securely fastened.

## Operation

If correctly installed the injector(s) should operate quietly with the minimum of noise or vibration. If the injector(s) become noisy or excessive vibration is apparent this may indicate that there is a problem. It may be that an injector has become loose or that an injector discharge has become obstructed.

# Installation of Steam Injectors Type IN

## Installation

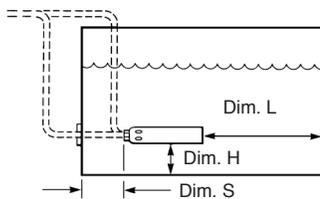
Install the injector(s) at low level in the tank, discharging horizontally along its length. Though generally fitted at one end of a tank, separate injectors at each end of a very long tank could be considered. For high capacities, two or more injectors may be installed in parallel.

**In all cases, steam supply pipework must be firmly anchored to avoid vibration or stress in the tank wall.**

Discharge from injectors must not impinge on any of the tank internals e.g. pipework, stays, etc.

For quiet operation, dimension L should be as large as possible. The following table gives recommended minimum lengths.

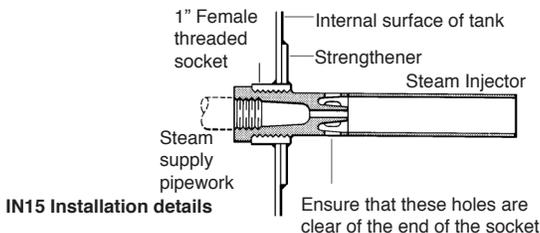
Steam Pressure at inlet of injector psig barg	Min. Dimension L IN15 inches mm	Min. Dimension L IN25/40 inches mm
30 2.0–50 3.5	8" 200	10" 250
51 3.6–100 7.0	10" 250	20" 500
101 7.1–140 10.0	12" 300	30" 750
141 10.1–200 14.0	14" 350	40" 1000
201 14.1–240 17.0	16" 400	50" 1250



For pipeline mounted installations, dimension S should be as small as possible. For ease of installation this will typically be 4-8 inches (100-200 mm).

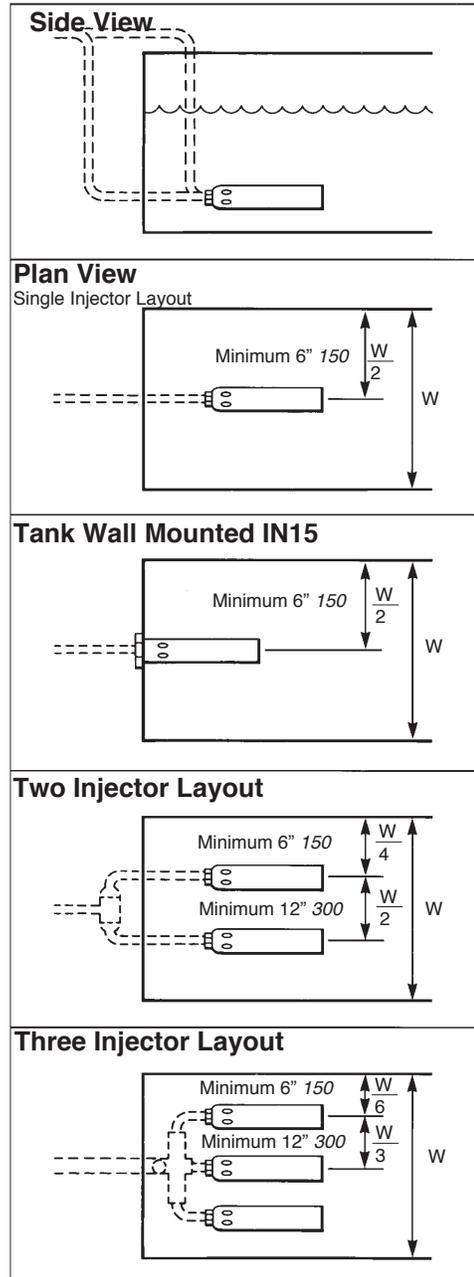
Injector Type	Minimum Dimension H inches mm
IN15	4" 100
IN25	6" 150
IN40	6" 150

Tighten both locking screws on IN25 and IN40 injectors after installation to the pipework. We recommend the use of a suitable thread sealant.



## Recommended Layout

Ideally, the injector(s) should be positioned about the centerline of the end of the tank. They should be equispaced across the width of the tank to ensure adequate mixing and circulation, and to minimize "dead" spots. The supply pipework manifold can be mounted inside or outside the tank for multiple installations.



Spirax Sarco Applications Engineering Department  
Toll Free at: 1-800-833-3246

SPIRAX SARCO, INC. • 1150 NORTHPOINT BLVD. • BLYTHEWOOD, SC 29016  
PHONE 803-714-2000 • FAX 803-714-2200