

**MAZZEI® INJECTOR INSTALLATION RECOMMENDATIONS
FOR GAS TO LIQUID MIXING APPLICATIONS**

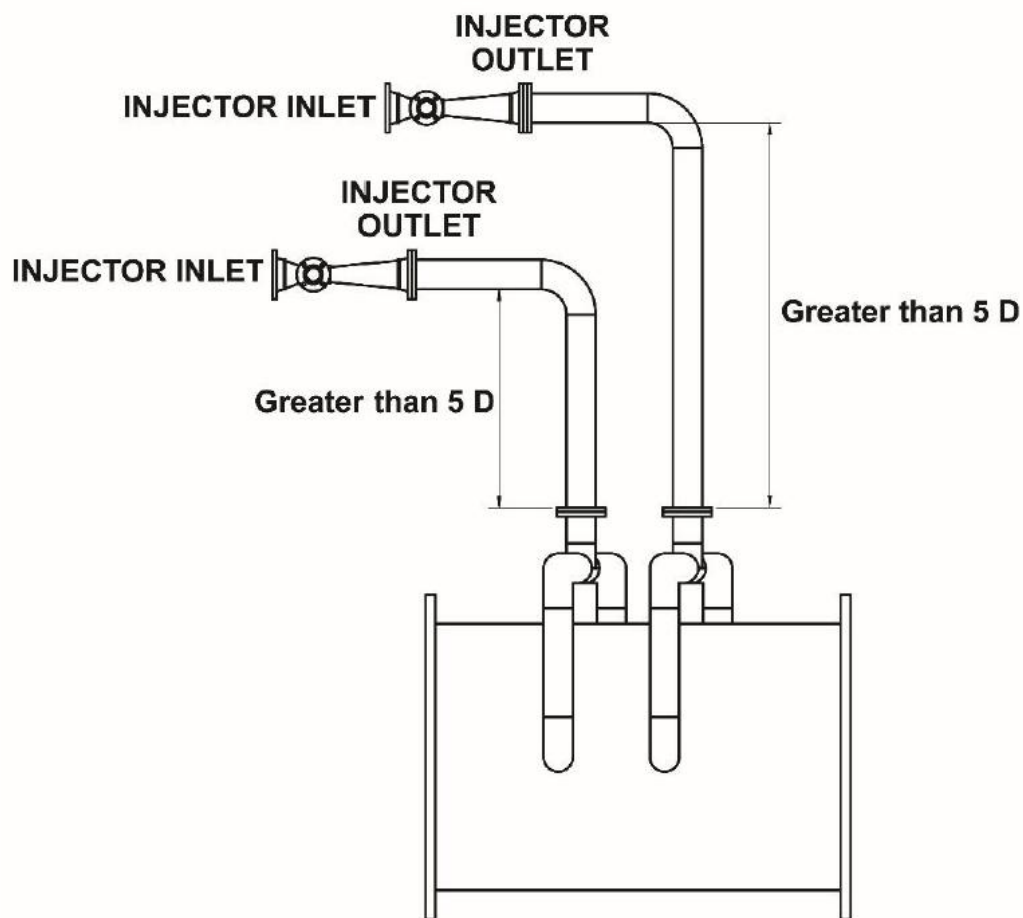
1. Install pressure monitoring devices immediately upstream of the injector water inlet to accurately measure water pressure entering the injector.
2. The injector should be installed horizontally. Injectors can be installed vertically with the flow upward (i.e. outlet up); however, in certain applications this may impact performance.
3. Mazzei recommends a straight run of interconnecting pipe with the same diameter as the injector be installed upstream and downstream of the injector. Straight pipe length requirements shall be measured from the injector inlet and outlet flanges. For minimum interconnecting pipe length requirements between the injector and valves, pipeline expansions, or changes in direction refer to the table below.

Gas:Liquid Ratio		
	≤ 0.5	> 0.5
Upstream	3 D	3 D
Downstream	5 D	10 D

D = Nominal Pipe Size of Injector Inlet/Outlet Connection

4. Similarly, Mazzei recommends a straight run of interconnecting pipe the same diameter as the PFR no fewer than three (3) pipe diameters upstream and five (5) pipe diameters downstream, measured from the PFR inlet and outlet flanges.
5. Install pulsation dampened pressure monitoring devices at the minimum distance downstream of the injector (detailed in Item 3 above) and before any valves, piping expansion or change in direction to accurately measure injector outlet pressure.
6. Install pressure monitoring devices immediately upstream of the injector suction port on the gas line (i.e., after any valves or fittings) to accurately measure pressure/vacuum conditions at the injector suction port.
7. Interconnecting piping and elevation changes between the injector and discharge point (e.g. connection to the Pipeline Flash Reactor™ (PFR) or Basin Nozzle Manifold (BNM)) should be minimized to maximize performance.

8. A minimum vertical downcomer distance of 5 D (where D = Nominal Pipe Size) is recommended with a long-radius elbow for flow transition from the injector line to the PFR or BNM inlet flange for close-coupled installation. Multiphase flow velocity downstream of the injector requires careful consideration in order to prevent stratification, particularly at high gas-liquid ratios. Please contact Mazzei customer support if detailed evaluation is required.
9. A separate pipeline must connect each injector to each PFR or BNM nozzle manifold flange connection for multiple injector installations.



**D = Nominal Pipe Size of Injector
Inlet/Outlet Connection**

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