

Piping and Directional Manifold Guidance

PDS-NB-001 | Design | Intended for: Designer

Design objective

The piping system must deliver the nozzle flow and pressure while directing treated water through the intended area. A discharge manifold can improve distribution, but every added branch, valve and change in direction adds resistance.

Preferred arrangement

- Use the shortest practical suction and discharge routes with gradual changes in direction.
- Size the pump from its performance curve at the complete-system duty point.
- Provide a pressure gauge near the nozzle inlet and a flow measurement point where practical.
- Use unions or flanges for service access and isolation valves that cannot accidentally dead-head the pump.
- Support piping so the nozzle and fittings do not carry pipe weight or vibration.
- Keep the pump intake separated from the treated-water discharge so the system promotes circulation rather than short-circuiting.

Directional discharge manifold

- Calculate the required flow at each outlet and the combined flow through the nozzle.
- Use balanced branch lengths and comparable outlet restrictions when equal distribution is required.
- Provide individual balancing valves only when they can be set and protected against accidental closure.
- Increase the main header size when necessary to limit velocity and friction loss.
- Aim outlets to support broad circulation without eroding banks, disturbing sediment or stressing aquatic life.
- Multi-directional discharge may require a higher-capacity pump. Recheck the pump curve after the manifold layout is finalized.

Passive ambient-air piping

- Connect every gas port using equal or balanced branches.
- For smaller models, 6 mm OD x 4 mm ID branches are commonly used where supplied. For systems at or above approximately 250 m³/h, a larger common line such as 12 mm OD x 8 mm ID may be required. Confirm the supplied fittings.
- Keep the common air line straight and low resistance. Place the filter above the highest possible water level.
- A water trap or drain point may be used where condensation or splashback is possible, but it must not create excessive suction resistance.
- Do not assume an ordinary spring check valve is suitable for passive suction. Confirm cracking pressure and restriction first.

Material and connection checks

- Verify pipe outside diameter; nominal pipe size alone can be misleading.
- Specify smooth-end, NPT, BSPT/BSPP, JIS, ANSI/ASME, DIN, ISO or custom connections at ordering.
- Confirm pressure, temperature, ultraviolet exposure and chemical compatibility.
- Use ozone-compatible tubing and fittings where ozone is selected.
- Install hydrogen-peroxide dosing separately upstream with compatible wetted materials.

Design caution: This guide does not establish structural supports, electrical design, gas-system compliance or local code requirements.