Shield water requirements (VWI and OptiMix)

If you use water as a shield fluid, refer to Table 9 for water pressure and flow requirements and Table 10 for water-purity guidelines.

If using shield water, the temperature range for cutting system operation and storage is reduced to above 0°C to 40°C (32°F to 104°F).

Table 9 – Quality, pressure, and flow requirements for shield water

Quality*	Minimum and maximum pressure	Flow rate required
Deionized water is **not** recommended to use as shield water. Deionized water will react with the copper components in the system and result in decreased life of components and consumables. Hypertherm recommends that you contact a water-quality expert for guidance.	2.76 bar (40 psi) minimum 8.27 bar (120 psi) maximum	35 L/h (9.4 US gal/h)

Table 10 – Purity requirements for shield water

Particulate type	Purity requirement
Total dissolved solids	< 61 PPM
Calcium + magnesium	< 40 PPM
Silica	< 5 PPM
pH	6.5 – 8.0

A TDS meter indicates the Total Dissolved Solids (TDS) of a solution. Dissolved ionized solids (such as salts and minerals) increase the electrical conductivity of a solution. Total dissolved solids can be tested with a TDS meter (Hypertherm Waterjet part number 1-13897) available from Hypertherm.

* Water that does not meet minimum purity specifications can cause excessive deposits on the torch nozzle and shield. These deposits can alter the water flow and produce an unstable arc. Refer to Shield water requirements (VWI and OptiMix) on page 52.

Plumbing and hose requirements for shield water

The installer or user must supply the plumbing and hoses for the shield water.

- You can use flexible hoses that are designed to carry water.
- For the best results, use the recommended torque specifications for plumbing and hose fittings. Refer to Table 11 on page 53.
- You can use rigid copper pipes.
- Do not use steel or aluminum pipes.

Install the plumbing and hoses consistent with all local and national codes. After installation, pressurize the entire system and test it for leaks.

To decrease the risk of leaks in the cutting system, make sure to tighten all connections to the recommended torque specifications in Table 11 on page 53.

Hoses are available from Hypertherm. Refer to Water (optional shield fluid) (blue) on page 391 of the Parts List.

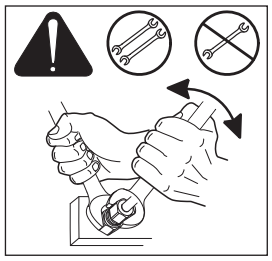
Additional regulator requirement for shield water (optional)

Water pressure regulators are built into the VWI and OptiMix gas connect consoles. Additional water pressure regulators are only required when the water pressure is above 7.92 bar (115 psi).

Torque requirements for gas or water plumbing and hose connections

For the best results, use the recommended torque specifications for plumbing and hose fittings.

Table 11 – Torque specifications



Torque Specifications			
Gas or water hose size	**N·m**	**in·lbf**	**ft·lbf**
Up to 10 mm (3/8 inch)	8.5 – 9.5	75 – 84	6.25 – 7
12 mm (1/2 inch)	16.3 – 19.0	144 – 168	12 – 14
25 mm (1 inch)	54.2 – 88.1	480 – 780	40 – 65

Requirements for shield water removal for freezing-ambient temperatures

If your XPR cutting system uses shield water and is stored in ambient temperatures at or below 0°C (32°F), Hypertherm recommends shield water removal.

Follow these steps to remove shield water from the gas connect console (VWI or OptiMix):

1. Remove the shield water supply line to the gas connect console.
2. Access a source of compressed air that is clean and dry. Use a regulator to adjust the compressed air to 5.52 bar (80 psi).
3. Connect the compressed air hose to the water inlet on the gas connect console.

   The air hose needs to adapt to a JIC 6 male fitting on the gas connect console.

4. Use the XPR web interface or CNC to select a process ID for a water process (such as 2028).
5. Select **Preflow** from the Plasma Process Selection menu.

   During preflow, water mist will exit the torch nozzle for approximately 45 – 50 seconds.

6. Repeat step 5 until shield water mist is no longer visible exiting the torch nozzle.

   It can take 7 – 10 preflow cycles for the shield water mist to stop.