Messana System Pressure Test and Fill / Purge Procedure

The Messana pressure testing and filling procedure are a crucial part of the Messana installation process. They ensure that all connections are properly connected and leak free. This procedure is mandatory and necessary to validate the warranty. The high pressure burst test must be signed off by an authorized third party.

Typically, prior to the Messana panel leader and piping burst test all distribution supply and return piping to manifolds should be have been tested and inspected during the rough framing inspection.

At this stage all the active Messana panels should be installed. Once all the Messana panel leader piping has been installed and all connections made to the appropriate connection points per plan/specifications then it is time to burst test the system.

Tools and equipment needed:
- Air compressor that can reach 100 psi.
- 160 psi pressure gauge
- Eye protection (safety glasses)

High pressure burst test

The first test is a high pressure burst test. The intent of this test is to make sure all fittings are completely connected and leak free.

1. Prepare manifold

Open all the supply and return leader ports on the manifolds so that each port serving the Messana active panels are fully open. This is a vital step and must be done otherwise the test results can be false. If the supply and return ports are not opened then only the manifold will be pressurized. Once the manifold is pressurized even if you attempt to open the supply and return ports they will not be able to open due to the high pressure already within the system.

**Messana recommends that isolation valves are installed on main supply and return piping at the manifolds**

![1" Pro-Pal Full Port Forged Brass Ball Valve w/ Hi-Flow Hose Drain & Reversible Handle](image-url)
2. Next step would be to install the pressure gauge on the system, typically installed on the return side of the manifold header on a block and purge port at the manifold.

3. Next, connect the high pressure hose from the compressor to a place in the system that you can watch the pressure gauge. Connect the air hose from the compressor to the supply side of the manifold on the Webstone BV purge port.

4. Take the 160 psi pressure gauge with a hose bib adapter installed on it and attach it to the return side of the manifold on the Webstone BV purge port. (see image below of example pressure gauge and adapter).

5. Fill the system slowly watching the gauge and walking around and listening for any leaks, this may require a time on the project that there are no other noises. It is a good idea to stop at 50 psi and walk the job to listen for leaks. If no leaks are found, then continue filling the system to 100 psi.

   The pressure of 100 psi must be achieved to ensure that any fittings where the piping was not fully inserted will be found and fixed.

   Make note of the time and pressure then document. Walk the job again to listen for leaks. After 15 minutes come back and check the gauge reading and document time and pressure again. If you find a leak, make the repair and retest.

6. Release all the pressure from the system. The high pressure burst test is complete.
This portion of the procedure will describe how to fill the system with water and purge out all the air. This should be done only after the burst test is completed and any possible leaks have been fixed.

**Important:** Before proceeding with the fill/purge the entire system including buffer tank should be pre-filled using a clean water source. This can be done by directly filling the system without concern for air being introduced since it will be removed in the following steps.

We recommend using a (Thermal Imaging Camera) so you can see the flow of water through the panels to ensure everything is working properly and the water is circulating through all the panels.

**Tools and equipment needed**

- Duty/Transfer pump (Liberty Pumps 331 1/2-Horse Power Portable Transfer Pump)
- 3-Short garden hoses or washing machine hoses w/ spare hose washers
- 2 Clean 5 gallons or bigger buckets
- Good clean water source
- Thermal imaging camera
- Pressure gauge

**Important:** Make sure you have a clean water source and do not introduce any sand gravel or debris into the system.

There are several ways you can introduce water into the system. Best practice is via the Messana Manifold valve isolation with purge port.

1. Take one of the two hoses and connect it to the purge port valve at the manifold on the return side. Route the other end of the hose into one of the buckets. This bucket will be the purge bucket. Fill the bucket with clean water (make sure the bucket is clean and the water source is good).

2. Fill the other bucket with clean water. This bucket will be used to top up the purge bucket if necessary.

3. Using the second hose, connect one end to the purge port valve on the supply side of the Messana manifold and the other end to the outlet port of the duty/transfer pump. Take the third section of hose and attach it to the inlet side of the pump, place the other end of the hose into the bucket. (see the diagram below for reference).
4. Now you are ready to fill and purge.

5. Make sure that all the air introduced during the burst test is released from the system.

6. Close the Manifold valve isolation and all the supply and return leader valves.

7. Start at one end of the manifold and open the first leader supply (red knob) on supply header.

8. Start the Duty/Transfer pump assuring you have suction and that the inlet hose is in the bucket.

   ⚠️ You will need to keep adding water to the system unless you have a big enough bucket from the start. Make sure to have additional water available if needed.

9. With water now pushing through the supply, open the return side of the same loop. You should have a fair amount of air out for a minute or more, this will vary depending on how many panels make up that particular loop. Be prepared by holding on to or securing the return hose into the bucket. As water makes its way through the panels and back it tends to burst and splash. Run the pump full speed until all the air is out of the loop and you don't see any more bubbles. Once that loop is free of air and you have good flow with the duty/transfer pump still on close the return loop valve and then the supply loop valve.

10. Repeat this process on each loop until all loops have been filled and purged.

11. Once they have all been purged and no leaks are evident, open all leader supply and return valves and run the Duty/Transfer pump one last time to make sure that all the air is out of the system.

12. The last task is to pressurize the whole manifold and all the circuits using the Duty/Transfer pump. Install a pressure gauge on the return purge port and then pressurize to 20 psi.

   ⚠️ It's good practice to walk each zone/loop to assure there are no leaks.

13. Once you have completed the fill and purge at that manifold continue to the next if there are more than one.

14. You have completed the fill, purge and hydro test of the Messana panels manifolds.

   ⚠️ This test should be recorded, and the system should always be maintained under pressure during the construction phase. Follow all local building code guide lines for testing.