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## Installation and Maintenance Instructions for PumpSaver® braided metal hose assemblies

### Installation

1. Avoid torque. Do not twist the hose assembly during installation when aligning the bolt holes in a flange or in making up pipe threads. The utilization of lap joint flanges or pipe unions will minimize this condition.
2. To install a thread end braided metal hose assembly unions must be used. Do not place wrenches on the braided portion or the collar of the braided metal hose assembly. Use care not to torque the braided metal hose assembly while tightening the union. It is recommended that two wrenches be used in making the union connection; one to prevent the hose from twisting and the other to tighten the coupling.
3. Install the braided metal hose assembly with neutral face-to-face dimension as shown on the submittal drawing. Do not install a braided metal hose assembly compressed (bagged braid). The corrugated inner hose contains the fluid, the braid is designed to take the stress of system pressurization and contain the core.
4. If the braided metal hose assembly must be installed with an initial offset then the maximum allowable movement is reduced by the amount of the initial deflection.
5. Avoid over bending. The repetitive bending of a hose assembly to a radius smaller than the radius specified will result in early hose failure. Always provide sufficient length to prevent over bending and to eliminate strain on the hose assembly. Utilize sound geometric configurations that avoid sharp bends, especially near the end fittings of the assembly.
6. Verify that the movements of the system are within the design parameters of the braided metal hose assembly being installed.
7. Prevent out-of-plane flexing in an installation. Always install the hose assembly so that the flexing takes place in only one plane - - this being the plane in which the bending occurs.
8. The maximum system test pressure must not exceed 150% of the maximum rated working pressure as shown on the submittal drawing.
9. Check system pressure and temperature and do not exceed recommended performance limits. Operation beyond design limits will result in premature failure.
10. The corrugated metal hose alloy must be chemically compatible with the media in the piping system. If in doubt as to suitability, refer to a Chemical Resistance Data table or contact Flex-Hose Co. for guidance.
11. The flanges on a concentric increasing braided metal hose assembly have the bolt holes straddling the hose centerline. The mating flanges should also straddle the centerline to avoid torque on the braided metal hose assembly.
12. When installing weld end, or sweat end, braided metal hose assemblies, or when welding in the area of a braided metal hose assembly, extreme care is necessary to ensure no weld spatter comes in contact with the braided hose sections.
13. When installing bronze connectors with copper female sweat ends it is critical that the factory welds be kept cool. Protect the factory welds and use as little heat as possible during installation so as not to compromise the existing factory welds and the pressure capability of the assembly.
14. Press fit fittings require the mating tube to be square and burr free. Do not use oils or lubricants and only use the fitting manufacturers pre-lubricated sealing elements. Do not mix press fit fittings from different manufacturers. Always use the fitting manufacturer's instructions for proper pressing and testing.
15. A piping system, which utilizes braided metal hose to absorb movement, must be properly anchored and/or guided. Always support the piping to prevent excessive weight from compressing the hose and relaxing the braid tension.
16. Use care when handling the braided metal hose assembly during transportation, storage, and installation. The braided hose sections must not be allowed to bend, deflect, sag, or otherwise extend beyond their rated capabilities.
17. The shipping sticks, on flanged units, are to keep the braided metal hose assembly in its neutral end-to-end dimension during shipping and installation. After installation, the shipping sticks should be removed.

### Maintenance

1. The braided metal hose assembly should be inspected during routine maintenance to ensure there are no signs of external damage. Inspect for frayed or broken braid wires. Also inspect to ensure there is no damage to the hose. In the event that such damage is found, the braided metal hose assembly should be replaced.
2. During system shutdown braided metal hose assembly should be examined to verify no thermal axial motion has occurred causing compression of the assembly.

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