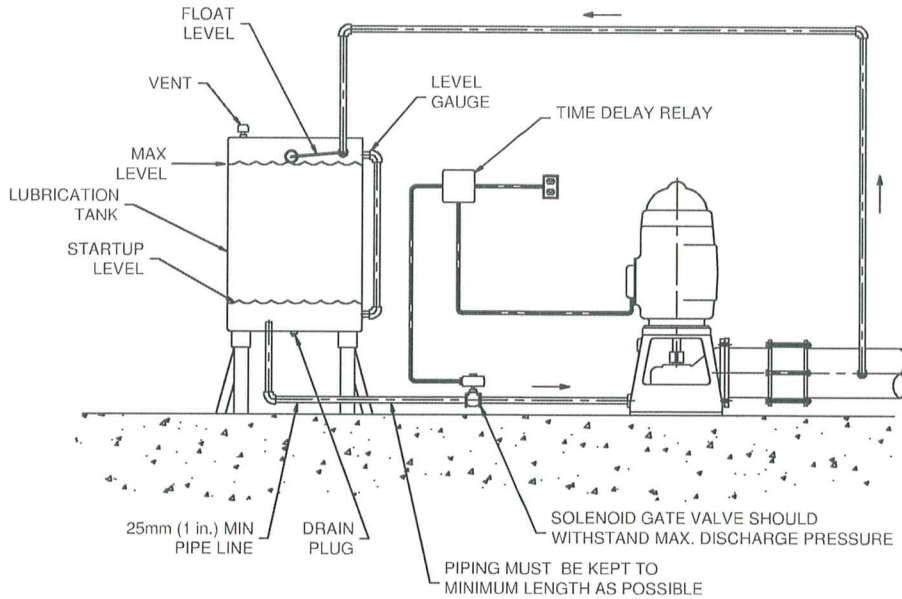


Example (d)



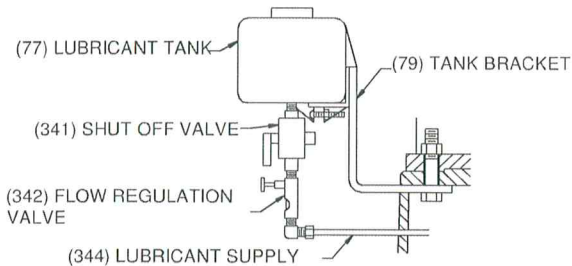
5.2.2 Enclosed shaft lubrication

VTPs with the enclosed shafting are lubricated by a dedicated oil supply system or injection lubricated by extraneous liquid; usually clean water to meet the application requirements.

5.2.2.1 Oil lubricated pumps

The lubricating oil must be available and should be allowed to run into the enclosing tube in sufficient quantity to thoroughly lubricate all lineshaft bearings. The gravity flow system is the most commonly utilized system for oil.

The oil reservoir (example shown in detail below) must be kept filled with a good quality light turbine oil (about 30 cSt) at the operating temperature and adjusted to feed a minimum of 3 drops per minute per 30 m (100 ft) of column length, but not to exceed 5 drops per minute.



5.2.2.2 Pre-lubrication of oil lubricated pumps

As a general rule, the oil must be allowed to flow by gravity at least 45 minutes before the pump is started for the first time or in case the pump was turned off for a longer duration. Adequate care should be taken to make sure that the flow is available and is consistent for subsequent startups.

5.2.2.3 Injection lubricated pumps

Enclosed lineshaft bearings are lubricated by extraneous liquid (usually clean water), which is fed to the tension nut either by gravity flow, or by a pressure injection system.

Note:

Injection systems are designed for each installation. Injection pressure and quantity of liquid will vary. Normally 0.45-0.90 m³/h (2-4 gpm) at 0.7-1.4 bar (10-20 psi) over maximum pump discharge pressure of clean liquid is required.

5.2.2.4 Pre-lubrication of injection lubricated pumps

As a general rule, the liquid flow is to be started at least 15~20 minutes before the pump is started for the first time or in the event of pump not being in use for longer duration.

The injected lubricant flow is never stopped for short 'off' periods. Adequate care should be taken to make sure that the flow is available and consistent for subsequent startups and operation. Injection pressure to be adjusted as recommended before the startup.