

# FLUSHING RIGS



Flushing is a process of cleaning the internals of hoses, tubes, pipes and fittings after manufacture, or job work, to get rid of burr, dirt, sludge, scaling and other deposits within them. Flushing is also necessary periodically to clean the internals of hoses, tubes, pipes and fittings, as also prevent blockages or constrictions created by plugs formed due to the flow, composition and dirt of the medium passing through the hoses, tubes, pipes or fittings. Flushing is required on both pneumatic as well as hydraulic lines.

Flushing rigs are simple machines meant to do two things.

Firstly, to remove dirt, grime, deposits etc on the walls of through and through tubular passages.

Secondly, they are meant to remove blockages.

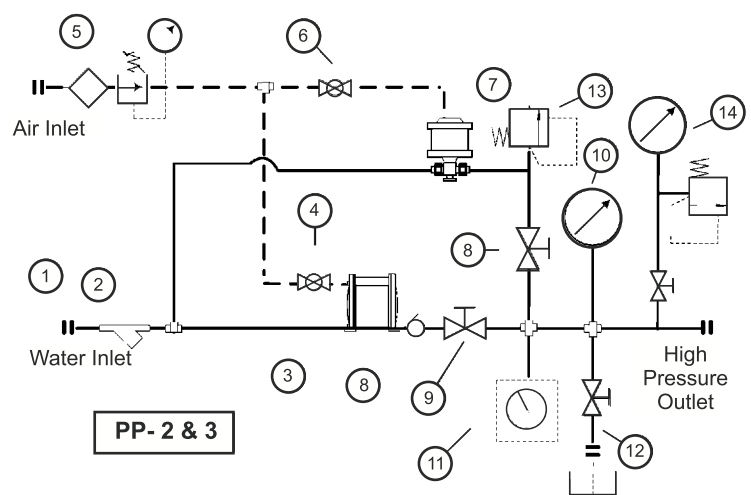
The first is achieved by creating a high energy turbulent flow at specific Reynolds Number (ratio of inertial and viscous forces, represented by the velocity of the flow in free stream) corresponding to the media that is used for routine operation or for flushing. The turbulence and velocity during flushing needs to be proportional to what is it that you are trying to remove (worst case being Asphaltine – Tar, very sticky substance, in oil & gas / petrochemical industry) as also the max flow and pressure rating of the item being flushed.

The second, removal of choking and blockages, this is achieved by using high pressure, to push out the unwanted plugs from within the piping systems. The quantum of pressure once again depends on what is the substance that is likely to create the blockage (again Asphaltine is the worst case).

In some applications ( aerospace, naval submarines, gas turbines etc, flushing is done to also clean the hydraulic fluid to NAS-5 level to get rid of particulate or condensates.

In general, for cleaning purposes, use of heated fluids, or detergents chemicals, could improve the results of flushing. The sensible method of doing such things is usually by using two types of pumps one with a high flow and the other with high pressure (flow and pressure are inversely proportional as far as pumps are concerned, when one increases the other reduces).

More often than not, flushing rigs are custom made since it is industry specific and process specific. The pumps on flushing rigs are generally either electrically driven or compressed air driven. When using inflammable or corrosive fluids, or when the operating conditions are hazardous area (Class #1, Zone-1, T3 type), the air driven ones are the norm. A simple flushing rig generally consists of the pumps, pump specific motors and controls, a tank, return to tank line, filters, fluid pressure and flow controls etc. In complex systems, PLC systems take over from mechanical controls. "Three In One" Hi-LO type of flushing rigs can also be done to not only flush the systems, but also to do Hydro Static Proof Pressure Testing, Pneumatic Leak Testing and revalidation / re-lifting of older piping systems, all of which are a must in infrastructural projects as well as high tech industries where industrial and personnel safety is of paramount concern.



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