



## Powerflushing Central Heating Systems

**On new installations it is imperative that the system is hot flushed with a pre commission cleaner to remove any signs of flux residues. If this is not done correctly residues can be left behind and will start pinhole corrosion from day one.**

If a Powerflushing pump is used it will ensure that all residues are removed. As magnetite corrosion or lime scale will not be an issue in new installations a flushing unit capable of circulating cleanser sufficiently around the system need only be used.

Where installers are working on all types of installation, a machine with reversing flow and double dumping features with the ability to be used on the system with the boiler running at normal operating temperature is desirable in order to achieve a quicker clean. Chemicals will work better at normal system temperatures and should be used in all cases of boiler changes to ensure a clean system before fitting the new boiler if possible.

### Vented Systems

As a quick rundown of the routine wherever possible on vented systems, connect the powerflushing machine to the system by removing the circulating pump (combination boilers or sealed systems are dealt with in another way which we shall discuss later) and connect the powerflush machine with 1" BSP pump adaptors. Make all other connections to the machine i.e. cold water mains fill line, dump hose and overflow out to foul drain. The use of a secondary containment tank to stand the machine in during use is good practice to safeguard against accidental spillage.

When all connections are made, make sure all radiator valves and Thermostatic Radiator Valves are fully open. The flow and return valves on the powerflushing machine should be closed at this time and never opened until the pump has been started. At this point locate the feed & expansion tank, isolate the water supply to it, open the flow and return valves on the machine and allow the contents of the feed & expansion tank to drain into the machine up to max level, closing these valves on the machine when up to the max mark. This should have left the tank almost empty. Now disconnect the cold feed 15mm and temporarily join together with the 22mm expansion pipe, this will give us a sealed system and allow these pipes to be cleaned during the cleaning process. The feed & expansion tank

should be cleaned separately and returned to its location ready for re instatement after the system clean has been completed.

We now have a system full of water and also the machine, it is best to purge the system now removing as much loose debris and old inhibitors etc, next simply start circulation, open flow and return valves on the machine and use the diverter valve to change direction of flow during circulation. Then set the machine into dump mode replacing the dirty water with clean water via the cold water fill line. When water running to drain is clear, stop dumping and re instate the flow, at this point introduce the system cleaner and if boiler is working, fire up and run to max temperature that the machine will allow, a higher temperature means a quicker clean.

The cleaning period can be around 2 hours on a 10 radiator system; this may vary according to the amount of corrosion present. During the cleaning period change direction of flow often thus keeping all small particles in suspension. When enough time has been allowed for the chemicals to clean the system turn off the boiler and then start the dump process. Acid based chemicals **MUST BE** neutralised whilst full circulation is in action before being dumped to a foul drain, a pH of between 6.5 and 8.5 is required by the Water Authorities. To eliminate the need for neutralising it is suggested that non-acid based chemicals be used.

To start dumping close both radiator valves on all radiators except the one nearest to where the machine is connected to the system, circulating now around the pipe work, one radiator and the boiler. Use the diverter valve to change direction frequently for a 2 or 3 minute period, then set the machine into dump mode and allow fresh water into the machine. Ensure that the level of water is maintained in the machine and monitor the contents running to drain. When the colour has changed to clear stop dumping and re instate the flow to that radiator. Close both valves thus isolating the radiator with clean water in it, walk to next radiator open the valves and repeat the process. Do this all the way around the system and when the last radiator has been cleaned open all radiator valves again to give full circulation. At this point a sample of the system water should be taken. This should be tested with a Total Dissolved Solids meter "TDS" and compared with the results from a sample of the

mains water. The reading should be within 10% of the mains water to indicate a clean system, if not continue to purge the system with clean water until desired reading is obtained.

When the system is clean you may introduce the corrosion inhibitor into the powerflushing machine and allow to circulate for around 10 minutes. Finally close the flow and return valves on the machine, stop the machine, isolate from the system and remove it. Reinststate the pump and feed & expansion pipe work to the tank, introduce more corrosion inhibitor into the feed and expansion tank to bring it to the recommended dosage, "never under dose". Drop the ball valve, fire up system, check for air and leaks then balance the system. Check the inhibitor strength with an inhibitor test kit within 2 hours of job completion.

Remember if the circulating pump is left in the system, you must isolate the power supply to it so as not to have the machine and pump working in opposite directions.

[For best results on systems with combination boilers, where possible the unit should be connected at the pump position, the pump having been removed temporarily. If this is not possible then a radiator on the system can be removed and the unit connected across the tails.](#)

When connected across the tails and system is charged with water, introduce the cleaner into the machine and circulate around the system, isolate machine and stop it. Open filling loop and bring system up to working pressure, start the boiler and allow to run with its own pump during the cleaning process. After the allotted time, close down the boiler and start the powerflush machine, open flow and return valves to start circulation utilising diverter valve to bring all loose particles into suspension, then proceed with dumping as for a vented system. When dumping is complete and system is clean introduce corrosion inhibitor into the machine, circulate and then close down machine, remove from system, clean the radiator that was removed and refit it. Finally open filling loop and exhaust all air in radiator and system, fire up, test for leaks and balance the system.

*The Chartered Institute of Plumbing & Heating Engineering cannot accept responsibility for any errors or omissions contained in this information.  
www.ciphe.org.uk.*

DB/DD 01/05