

SECTION C – FREQUENTLY ASKED QUESTIONS ABOUT POWER FLUSHING

Q. How long does it take to power flush a system thoroughly?

A. It will vary from house to house, but generally about four to five hours for a three bed house with a vented system, but less time for a sealed / combi system, because you don't have to cap off the cold feed and expansion piping.

Q. How big a heating system can you use the Quantum on?

A. Follow the normal procedures for systems up to 12 radiators. Tackle larger systems, in sections. For example, with a twenty radiator system, close off ten radiators totally, and flush the rest of the house normally. Once done, close down all the flushed radiators, and repeat the procedure on the rest of the system.

Q. Do you need to drain down the system before you start?

A. No. You only need to run some water out of the system to lower the water level in the feed and expansion tank, so that you can cap it off.

Q. Can you over pressurise a system, and cause joints to leak?

A. No. The Quantum is a centrifugal type pump. What it can't push through a system, it will simply re-circulate in the tank. Maximum pressure is less than two bars. It is the flow rate through a system that is important when power flushing.

Q. Can I use a rubber bung kit, for use when changing radiators, to make the system a closed circuit?

A. No. The tapered bung inserted in the cold feed pipe will be forced out, and the expansion tank will fill up and overflow.

Q. Can I use plastic or metal push fit caps, such as "Speedfit" fittings, to make the system a closed circuit?

A. Yes, but check the push fit cap 'O' ring for wear regularly, and replace it if in doubt.

Q. What do I do if the expansion pipe on an old system is imperial size copper piping?

A. Why not extend the pipe slightly, using a compression fitting with a special imperial size olive, enabling you to add a short length of metric piping? Then use a push fit end cap as usual.

Q. If I connect my Quantum pump into the system across the tails of one (removed) radiator, what happens to that radiator? How should I clean it?

A. You'll need to flush this separately with a hose pipe (so pick a small radiator!). Alternatively, some engineers will adapt the outer end of their dump hose to fit onto one side of this removed radiator, with another adapted tube leading from the other side of the radiator to the drain. This way, every time you dump, you're putting a good flow of water through the radiator. By the time you've finished the power flush, the radiator should be very clean.

Q. What about firing the boiler whilst carrying out a system flush?

A. By all means fire the boiler if you can – most chemical reactions will proceed faster with some heat, and also, when you come to put the full flow through each radiator in turn, it's useful to be able to feel whether the radiators are heating up across the whole area, or whether they have cold areas / panels. If they do, then you can give that radiator extra attention.

A Quantum pump will handle water temperatures above 70°C. We suggest firing the boiler for five minutes, but there's no need to leave the boiler firing continuously.

If the boiler is non functional, or being replaced, then you won't be able to fire it anyway. If you're using a powerful chemical such as Powerflush FX2, you'll still get a good result even if you can't fire the boiler.

If you do fire the boiler, remember that when you switch it off, the heat exchanger is still very hot, and continues transferring heat to the water circulating through it, and to the Quantum.

If you can't keep your hand on the Quantum tank, switch the boiler off.

Q. Is it OK to dump very hot water from a heating system down a drain or sewer?

A. There is a Public Health Act regulation of 1936, which states that water should not be discharged down a public sewer at a temperature greater than 43°C, but in reality this is unlikely to be a problem when power flushing. However, do consider the risk of cracking a toilet pan if you discharge very hot water into it when power flushing.

Q. Are there any other possible problems when dumping water into a toilet pan?

A. Yes, and the most likely one is the dump hose sliding out of the toilet pan when you start dumping, and flooding the bathroom, so trap it in place with the toilet seat before you start work. Better still, use a piece of cord to tie the dump hose to the seat hinge. Also, consider whether the porcelain might be stained by the discoloured dump water.

Q. Why shouldn't I use a Quantum pump with scalding hot water?

A. A Quantum may need to be used with very strong chemicals, such as neat hydrochloric acid, when being used for descaling. To enable this, all wetted parts are either plastic, or are sleeved in plastic, and this imposes a temperature limitation.

At high temperatures the clear plastic flow and return hoses will become very flexible and may kink, so don't put scalding water through them. High temperature resistant hoses can be fitted to a Quantum pump – but this type of plastic is not transparent, and you'd lose the advantage of being able to monitor water cleanliness by viewing the water as it travels through the pipes.

And last, but not least, working with scalding water poses risks to you!

Q. On some systems, when I am dumping the water from the system, and I have used the boiler to heat the water during the power flush, I notice that the radiators are cold at the bottom, and warm at the top. What's happening?

A. A Quantum pump circulates the water through a system much faster than the standard system pump, and it is the cool fresh water speeding straight across the base of the radiator that you can feel.

Eventually the warmer water will be swept from the radiator, but you can speed it up by introducing some air into the top, of the radiator to force the water level down, using a Kamco Systemsure injector. (see page G.5)

Q. What do I do if I arrive at a house where the heating has been working, and the water temperature is above 70°C? Do I have to wait for the water to cool down?

A. No. Once you have connected the Quantum into the system, and connected all hoses, immediately set the valves into the dump mode (dump valve open), and then switch on. Run and dump for a couple of minutes, allowing cold water in to the system, before reverting to the normal flushing procedure.

Q. Can you power flush a microbore system?

A. Yes, but connection of the Quantum should be on to the circulator pump fittings, and not on to a radiator, otherwise the small bore tubing will drastically reduce the flow rate, and the system power flush will be less successful than normal. We advise using 5 litres of FX2 (instead of the usual 2.5 litres), to ensure the particles of debris are dispersed in as fine a form as possible.

If you can't clear a radiator on a microbore system, it may be that a plug of sludge is blocking the narrow diameter pipework leading back to the manifold. If you have a Kamco Systemsure injector, the following can be worth trying to restore flow to the radiator.

Switch off and isolate the Quantum. Close both valves on the problem radiator. Attach the injector unit to the air bleed screw fitting, and pump up the pressure as high as possible.

Quickly open one radiator valve, and the air will often dislodge and move the semisolid sludge along the pipe. Close the radiator valve, pump up the injector again, and open the other radiator valve. Finally, direct the full flow of the Quantum through the radiator, with both valves open.

Q. Can you power flush a microbore system with double entry radiator valves?

A. Yes, but we suggest that you double the amount of FX2 to 5 litres. If the distributor / spreader tube, which directs the incoming water towards the far side of the radiator, has broken away, so that the entrance and exit are effectively only 1/2" apart, any flushing effect on that radiator will be minimal. Conversion to opposing inlet and outlet valves is a better long term proposition.

Q. Can you power flush a single pipe system?

A. If the radiators on a single pipe system have severe deposit build-ups, or cold panels, then the powerflush is not likely to be successful. If you do take on such a system, improve the chances of success by pre-treating with two litres of HYPERFLUSH, and operate the flow reverser more often than usual whilst flushing individual radiators.

Q. Can you flush a very old system which has passivated steel or stainless steel piping, such as Truweld or Gecol?

A. Yes, you can, but we advise extreme caution, and you should always point out to the householder that you cannot guarantee that there will not be any leaks. These were 'stop-gap' materials used during a period (late sixties/early seventies) when there was a copper shortage, and were not expected to have a very long life.

The passivated steel tube (similar dimensions to 15mm copper tube) was fabricated from sheet steel, folded over, seam welded and galvanised. Thirty years later it has generally corroded internally such that it is on borrowed time.

The stainless steel tube supplied at that time was of a low quality and is prone to pitting corrosion, and again is on borrowed time.

If in doubt, do not power flush the system. If you accept the job, use HYPER-FLUSH instead of FX2 – and always ask the householder to sign a disclaimer!

Q. Are there any other systems I should treat with caution?

Look out for low quality 15mm copper tubing of continental original, also supplied at the time of copper shortages. It was prone to pitting, and had a very thin wall thickness, such that it could not be bent. You can recognise it because the manufacturers kindly printed a red line along it!

Q. What about double panel radiators - won't the water take the course of least resistance and just clear one panel?

A. Yes, it will. However, whilst carrying out the individual radiator flush, gently tap the front panel with a rubber mallet, where the brackets attach to the rear panel. There will always be at least four points of connection, at both ends, top and bottom. This vibrates debris loose with surprisingly good effect.

Many engineers tap every radiator along the lower edge with a mallet as they open it up for the individual radiator flush, to vibrate loose any compacted sludge trapped in the bottom seam.

Q. What can I do if I am working on a radiator with such a severe build-up of corrosion debris that I am struggling to clear it all.

A. Difficult radiators such as this will often respond to use of the Radhammer vibrator device, also supplied by Kamco. This device clicks into the chuck of an SDS drill (on a hammer only setting) and is applied firmly to problem areas of the radiator. The high frequency vibration will loosen debris that will not respond to any other cleansing method.

Q. Any problems with thermostatic valves (TRVs)?

A. Generally, no. Some thermostatic valves may stick down, or act as non return valves, so open valves fully, and remove the valve heads. Push down on the sprung pin a few times to ensure valve is fully open.

Q. Can the Quantum be used on a system which has a Primatic single feed cylinder?

A. It is necessary to disconnect or loop out the Primatic cylinder otherwise the high flow rate of the Quantum will dislodge the air bubble in the cylinder, leading to mixing of radiator and tap water.

Be aware that the Primatic cylinder was often used in a gravity hot water system, with separate pumped flow and return piping to the radiators. Consequently, connecting your Quantum onto the flow and return piping to the Primatic will not enable you to power flush the radiator circuit.

This would have to be power flushed separately, ideally by connecting across the system circulator pump connections.

N.B. Remember that Water Bye-laws prohibit the use of corrosion inhibitors in systems with a Primatic cylinder, because of the risk of contaminating the domestic water supply.

Q. Can you tell if the cold feed on a vented system is blocked, without cutting into the pipework?

A. Not conclusively, but if you cap off the expansion pipe before attempting to drain down the contents of the expansion tank into the Quantum tank (see the instructions), then if water doesn't run down into the Quantum tank, there's a very strong possibility of a blockage.

Engineer's tip:-

If the blockage contains much black iron oxide (known as magnetite), you can tell it's there by holding a small magnet near the copper pipe – you'll feel it being attracted to the magnetite through the wall of the copper pipe.

Q. Can you power flush a system with plastic piping, such as Hep20?

A. Yes you can. FX2 liquid, and HYPER-FLUSH, can be used on plastic pipework systems, and will not damage either the pipework, or the 'O' ring materials.

Q. What happens if there is no apparent flow through the Quantum unit when the flow reverser handle is in one direction?

A. If the system is a gravity hot water system, there is probably an anti gravity / non return valve in the radiator circuit. If the non return valve is accessible, either loop it out, or remove the plunger so that it doesn't prevent the flow of water in one direction. If you can't find the non return valve, the flow reverser lever must be left in one direction.

Q. If the system has a gravity hot water circuit, won't that reduce the flow rate of water through the radiators when carrying out the individual radiator flush?

A. If you use the circulator pump adaptor leads to connect across the circulator pump connections, or connect onto radiator tails, you shouldn't lose much of the flow, if any, through the large diameter pipework of the gravity hot water circuit.

However, this will not clean the gravity hot water pipework. Some engineers will re-locate the Quantum pump and connect it across the cold feed and expansion piping to force water through the gravity hot water circuit.

If there is one radiator on the gravity hot water circuit or a towel rail, as is sometimes the case, you may be able to connect your Quantum across the radiator tails.

In an ideal world, you would disconnect the gravity hot water pipework at the boiler, and then powerflush the hot water circuit separately – but this is far from easy in a back boiler fired gravity hot water system.

Q. I've connected my Quantum into a heating system, made it into a sealed system, opened the isolating valves, and switched on. The pump appears to be working, but the water level in the tank is overflowing. What's happening?

A1. You may have found that there's a non return / check valve in the system, and it is preventing the Quantum from pumping the water from its tank out into the heating system, i.e. no water is actually leaving the tank.. However, some water will drain back into the tank through the 'return' hose, and so the water level starts to rise.

You'll have to point the flow reverser lever in the opposite direction, and leave it there, unless you can find, and remove / bridge out the check valve.

(This occurs most often in a gravity hot water system, or one that has at some time been converted from such a system.)

A2. It's less likely, but if it is a sealed system, there may be an automatic pressurisation unit (sometimes known as an auto filler) connected to the system, to maintain the required pressure.

Switch it off, or it will be continually introducing more water into the system to try to top up the pressure, and as a side effect forcing water against the direction of flow you need for a successful power flush.

Q. Is it necessary to bleed radiators after a power flush?

A. Yes. However, the amount of air in the radiators is usually small. If you keep the water level in the Quantum tank at least 10 cm above the minimum, you'll minimise the air to be bled from radiators.

Q. Is it really necessary to carry out the individual radiator flushing procedure?

A. Yes. You can prove it for yourself by flushing a system without putting the full flow through each radiator in turn, and then dumping until the waste water is clear. Now put the full flow through each radiator in turn, and watch the water discolour again as more debris is brought into suspension.

Q. Do I need to carry out a separate dumping procedure on each radiator?

A. Yes, but don't do so immediately after adding the flushing chemical. If you do, you'll be dumping your flushing chemical straight down the drain, and will have to keep adding more as you work your way around the house.

Whilst we think that this is an excellent idea from a suppliers' point of view, it isn't generally necessary, as loosened debris takes many hours to settle or compact, and will have been purged from the system long before this could happen.

Put the full flow, with chemical treatment, through each individual radiator in turn. Only then, commence dumping, working your way round the house, ensuring the full flow through each radiator individually as you dump, by closing off all other radiators.

Q. What do I do if the mains water supply is very poor, and can't replenish the Quantum tank fast enough whilst dumping? Should I part close the dump valve?

A. The Quantum is supplied with an alternative water inlet facility on the rear of the tank, allowing for an additional water supply to be attached.

However if the mains supply is still poor, don't partially close the dump valve if the water level in the tank keeps falling. Wait until the water level is about 12 cm from the bottom, and proceed as follows according to whether you are carrying out the initial dump or the final dump.

Initial dump: rotate the dump valve to re-establish circulation through the system, leave the water inlet tap OPEN, and allow the tank to fill until the level is close to maximum, before returning to dump mode.

Final dump: to prevent dirty water going back around the system, rotate the dump valve by 90° into the closed position, leaving the water inlet tap OPEN. The water in the system will cease to circulate whilst the water in the tank will be replenished, allow the tank to fill until the level is close to maximum, before returning to dump mode.

Q. When flushing a system with a combi boiler fitted with a filling loop, do I need to connect a water supply hose to the Quantum inlet valve? Can't I just run water in through the filling loop during dumping?

A. No. It is important that fresh water is fed into the system via the Quantum tank. Introducing the water through a filling loop elsewhere will destroy the high velocity mono-directional flow and hence the efficiency of the whole power flushing process.

Q. Can I use Powerflush FX2 liquid on a system with aluminium radiators, or an aluminium heat exchanger such as found on condensing boilers?

A. No. We recommend that systems which include aluminium are treated with HYPER-FLUSH, ideally several days beforehand. You could then power flush the system with water alone, but for the best result we recommend that you use another litre of Hyper-Flush as you carry out the power flush.

Q. Is there a better way than a simple visual inspection to ensure that the system water is really clean?

A. Yes. A simple way to check that the water is chemically as clean as mains tap water is to take a sample both of tap water, and of the water exiting from the dump hose, and to take measurements with a Total Dissolved Solids (TDS) electronic meter. The dump water reading should be as close to the mains water as possible, and certainly within 5% of the reading obtained for tap water.

Another method is to use a turbidity tube to give a reading of suspended particulate matter in the dump water.

The turbidity tube is a long clear tube, with a marker on the base. Turbidity is determined by the degree of obscuration of the marker when looking along the length of the tube containing system water.

Q. Can you use the pump to add corrosion inhibitor to a system?

A. Yes, it's a good way to get corrosion inhibitor rapidly into a system and thoroughly dispersed. Before disconnecting the Quantum pump, lower the water level in the tank to just above the minimum level, close the dump valve, and add the inhibitor into the tank. Allow circulation through the system for ten minutes before finally disconnecting.

Part L: 2006 of the Building Regulations now requires you to treat a system with corrosion inhibitor.

Benchmark members specify the use of a corrosion inhibitor that has passed the DWTA (Domestic Water Treatment Association) performance Standard. Suitable inhibitors, including Kamco Systemsafe-DM, will display the Buildcert / DWTA logo on the pack, so check for this to ensure that you use an inhibitor that has been performance tested.

Q. Can the Quantum pump be set up and left unattended whilst I carry out another job elsewhere?

A. No, it is unwise to leave any powered equipment unsupervised in a domestic environment, with runs of hose and power cable, which could be in close proximity to householders, children, and pets.

Should there be an electricity power cut, the Quantum would stop pumping, causing its tank to overflow.

You will be using powerful flushing chemicals, and as for all chemical products, they should be treated with respect and kept away from children.

Q. How can I reduce the time taken to power flush a heating system?

A. In order to clean a system effectively you must carry out the full procedure, including putting the full flow through all radiators and sections of the heating system. However, you can reduce the overall procedure time if you use an inline magnetic power flushing filter.

This is installed between the heating system and the power flushing pump, and extracts magnetite (the major corrosion constituent) from the circulating water, which consequently clears much faster, reducing the time taken to obtain clear fresh water throughout the system. The volume of water required to power flush a system is also significantly reduced.

Q. Will power flushing cause damage to a heating system?

A. It is rare for a heating system to experience leaks after the power flushing process. However, experienced heating engineers will probably explain the following to householders:-

Sludge and debris are present as a result of corrosion over a long period of time.

The power flushing process will cure most circulation problems, but cannot undo the corrosion and gradual decay of heating system components that has led to the need to power flush the system.

Occasionally some systems may have radiators with localised deep corrosion pits, with only a scab of rust preventing the system water from leaking out. The vigorous flow rate required to mobilise sludge and deposits may dislodge such a scab, leading to a leak from the radiator during the flushing process.

The advanced stage of corrosion required for such a situation means that the leak would occur imminently even without a power flush. If it should be brought forward slightly by the flushing process, then it is better that it occurs whilst a heating engineer is present to remedy the problem, rather than for it to arise over a weekend or whilst the house is unoccupied.

Kamco power flushing chemicals are comprehensively inhibited, so that they do not affect the metals from which heating systems are constructed.

They are formulated so that they loosen and dissolve the corrosion products that cause boiler noise and circulation problems, enabling the power flushing process to power them out of the heating system.

It is important after the flushing process to add a good quality inhibitor, such as SYSTEMSAFE-DM, to the heating system to prevent future decay.