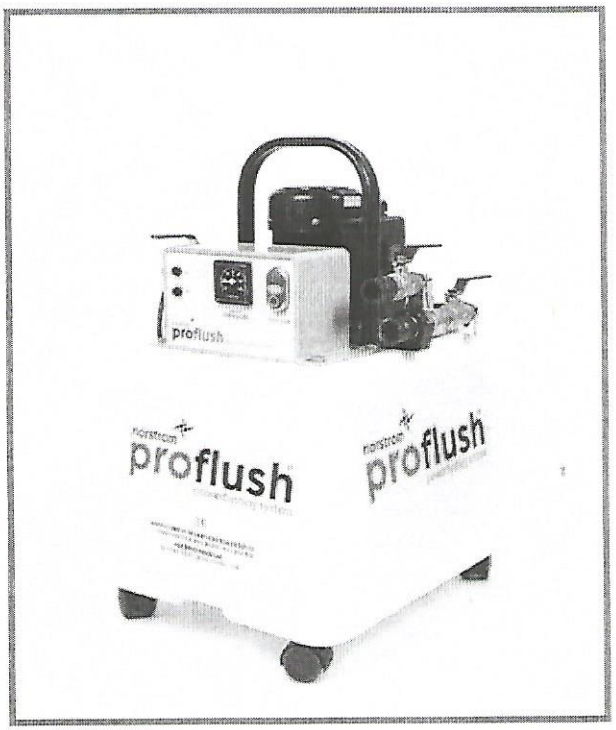
norstrom
GROUP

PROFLUSH System Operating Manual



As part of the Benchmark Initiative, Building Regulations Part L and BS7593-2006 it is imperative to chemically clean a central heating system when installing a new boiler or indeed on a completely new installation a Pre-Commission cleanser should be used and the correct strength of corrosion inhibitor should be entered into the system to give lasting protection.

Please read the following instructions prior to using the machine.

OPERATING INSTRUCTIONS

1. Turn off the heating system, after identifying problem flow areas, cold radiators, radiators with cold spots, etc.

2. Open all radiator valves, including balancing valves, fully. Before opening valves fully, first note how many turns are required to shut, so that settings may be re-instated after flushing, to avoid system balancing. (After powerflushing it may be that previous radiator settings will need to be reset anyway as a result of better flow rates).

3. Set any thermostatic radiator valves to the fully open position where appropriate. Check that diverter or zone valves are in the fully open position, setting manually if necessary.

4. If any anti-gravity valve is present, this must be by-passed or bridged, or the benefit of the flow reverser will be lost. It may be possible to dissemble the anti-gravity valve, and remove internal components, allowing two way flow during the system flushing.

5. It is necessary to make the heating system into a closed circuit by capping off, or alternatively looping together, the cold feed and expansion pipes. This enables the high flow rate of the ProFlush pump to force sludge and deposits from the system out through the Dump valve, and also prevents an overflow of the expansion tank. This stage involves draining some water from the system until the water level is below the F & E tank, and is best left until after the ProFlush pump has been connected into the system. These few litres can be allowed to drain into the ProFlush tank by briefly opening the two isolating valves. (By doing this you will establish whether or not there is any blockage of the feed pipe). (When flushing sealed systems, there is obviously no requirement to isolate an expansion pipe or cold feed.)

6. Isolate the cold water feed to the tank, or tie up the ball valve. Install a temporary compression fitting gate valve to the end of the open safety vent pipe where it discharges over the F & E tank. Proprietary sealing caps may be used, but MUST be secured tightly with a worm drive clip.

7. Install a temporary gate valve into the cold feed pipe close to the F & E tank. The tank fitting securing the pipe to the F & E tank sometimes has a male ¾" BSP thread protruding on the inside of the tank, and an alternative is to screw a cap on this.

   These are temporary measures only, and must be removed after the flushing process is completed. (If the system flushing pump connection method detailed in point 8d is utilised, cold feed and expansion pipes are automatically isolated).

   As an alternative to points 6 & 7, the cold feed and expansion pipe may be securely coupled together. The cold feed and expansion pipes are then included in the flushing process, which is beneficial if there is a deposit problem at the junction of the cold feed with the heating system.
   We recommend Prochem Descaler to remove these deposits.

Location / Connection

The optimum location for the ProFlush unit will vary depending on the system to be cleaned, and availability of suitable connection points. Generally the unit should be located in a room with a suitable drain or waste, and near to a convenient mains water supply, such as a bathroom or kitchen. The cold water supply for a washing machine or dishwasher is a convenient source when a mixer tap makes connection of a supply hose difficult.

The normal precautions during work on any heating system should be taken, and it is prudent to place a drip tray or waterproof ground sheet underneath the ProFlush and surrounding area.

8. Ensure that the isolating valves either side of the ProFlush Flow Reverser on the flow and return pipes are in the closed position. Connect the blue flow and return hoses of the ProFlush pump to the system at the selected point.
This may be either:

8.1 Across the "tails" to a radiator (having drained and disconnected the radiator) using appropriate 15mm or ¾" BSP female adapters to connect to the valve bodies. The radiator valves are available to isolate the flushing pump from the system if necessary.

8.2 Across the 1 ½" BSP female couplings left once the circulating pump has been removed. The circulating pump isolating valves are available for system isolation if required. An adapter set enabling the ProFlush to connect to the system is supplied as standard.

8.3 Across the flow and return connections at the boiler, isolating the boiler itself. This is the preferred method when flushing a heating system prior to installing a new boiler.

8.4 By breaking into and connecting across the cold feed and expansion pipes (after isolation of the water supply to the F & E tank) if these are easily accessible, (perhaps in an airing cupboard), and not adjacent to each other in the same pipe run. This method can clear deposit accumulations at the lower end of the cold feed pipe. The powerful action of Prochem Descaler will be required to achieve this.

9. If the ProFlush is not standing in a secondary containment tank, then a suitable length of ½" PVC pipe as required should be attached to the overflow ½" Brass Ferrule and led to a suitable foul drain or toilet pan. (Care should be taken to avoid draining very hot liquids into a toilet pan as you may crack the pan.)

10. Connect a suitable length of ¾" PVC hose to the dump line Camlock hose tail and make connection to the dump line Male Camlock and lead to a suitable foul drain or toilet pan. (See para.9 above)

11. Connect mains water supply hose ½" PVC to the inlet connection marked "Fill" and run the other end to suitable mains water connection point. Open the fill line ball valve, fill the ProFlush up to half way between the Min and Max fill lines, and then close the fill line ball valve. (If the F & E tank has drained down into the ProFlush tank, only topping up if required is necessary).

Method

Note: In the following procedure, the ProFlush is used to forcibly expel existing system water before establishing full chemically treated circulation through the unit itself. In order to expel as much loose debris and sludge as possible at an early stage, and prevent an excessive amount of debris collecting in the ProFlush tank. By removing loose material before the addition of any chemical, the full effect of the chemical is available to disturb, loosen, and dissolve more stubborn accumulations of debris.

12. Open isolating valves between flushing pump and system and switch on ProFlush immediately. Ensure that liquid level in tank remains above the minimum mark, adding more water if necessary, and allow pump to run for ten minutes, reversing direction of flow regularly. (Make sure that all radiator valves, TRV's and anti gravity valves are fully open)

Check all hoses and connections for leaks.

13. Ensure that Flow Reverser handle points away from Dump valve side of pump. Close return ball valve (which will be on the same side as the Dump valve), and open the Dump ball valve. By doing this, system water is diverted to waste down the dump hose, instead of returning back into the tank. The liquid level in the tank will immediately begin to fall, and the mains water inlet supply should be turned on so that the volume of incoming water compensates for that being forced out of the system to waste. Allow to run until the waste water runs relatively clear, check with a TDS Meter to ensure that the reading is within 20% of the reading on mains water. Ensure that liquid level in tank remains above the min line at all times.

14. Restore circulation through the ProFlush pump by opening the return isolating ball valve (Dump valve side), at the same time closing the Dump valve and water supply inlet ball valve. Check that the liquid level in the tank remains stable. Add more water if necessary. Vent all radiators to ensure that there are no air pockets. Use a cloth to absorb any liquid expelled from a vent, as the system water may be discoloured and likely to stain.

15. Add appropriate quantity of flushing chemical into the ProFlush tank. If scale is present in the system use 1 Litre of Prochem Descaler. This should be adequate for a normal three-bed house, i.e. ten single radiators/ 100 Litres. If the system has severe flow problems double dose the system with chemical. For systems with modest sludge problems 1 litre of Prochem Sludge Remover should be adequate or double dose for heavily sludged systems.

16. Circulate throughout the complete system for 15 minutes checking the entire system for leaks. If there are no leaks, you may fire up the boiler and run at temperature not exceeding 85° Centigrade for no more than 2 hours during which time any cold spots should be easily recognised as being cleared. If stubborn cold spots persist, aid the removal by gently tapping the radiator with a rubber mallet. During this period the F & E tank can be cleaned separately and re-installed ready for re-connection after the flush is completed.

17. If using Prochem Sludge Remover proceed straight to 19 omitting point 18.

18. If using an acid based product there is a requirement to neutralise the solution before pumping out to waste. Slowly add the Neutraliser to the solution in the ProFlush tank whilst circulation throughout the entire system is taking place. Continue adding the contents of the bottle until the whole system has been treated and neutralisation has taken place. Proceed with individual flushing as in point 19. The whole system MUST be neutralised before flushing to foul drain. ON NO ACCOUNT SHOULD ACIDS BE FLUSHED OUT WITHOUT FIRST BEING NEUTRALISED. Prochem Descaler does not need neutralisation as it is an acid-free product.

19. Turn off the boiler and close off all radiator valves except those on the radiator nearest to where the ProFlush is connected to the system. Flush this radiator for about 5 to 10 minutes using the flow Reversing Valve frequently to change the direction of flow and aid removal of all debris. Note: If the pre-cleaning system check identified cold or partially blocked radiators, commence the individual radiator flushing procedure with the worst affected radiator first, progressing to less problematic radiators. This ensures that the strongest concentration of chemical is directed at the worst areas of the system. It is not necessary to remove or disconnect radiators individually during this process. The first radiator being flushed out will take longer because you are flushing out not only the radiator but also the water in the ProFlush tank, the boiler and the rest of the circuit. Subsequent radiators will take less time.

20. When ready to dump the contents of this radiator to drain, close the Return ball valve and open the Dump line ball valve. Ensure that the Reversing Valve is pointing away from the Dump valve. This will allow the contaminated water to go to drain. On **Double Dumper** models the Reversing Valve should always point towards the opposite side of the machine to the Dump valve being used.

21. Open the mains water inlet ball valve and fill with fresh water keeping the level in the tank the same. After a short period of time the contents of the tank will have changed colour from dirty to clear. Again check with the TDS Meter, this time to get a reading within 10% of the mains water. If ok, close the dump valve, open the return valve and close the mains water inlet valve. Then close the radiator valves and move on to the next radiator in the series, repeating this procedure to the end of the system.

22. On completion of the flushing process open all radiator valves to give a flow on entire system. Repeat point 13 to flush out entire system and replace with clean water ensuring the level in the tank never falls below the minimum mark.

23. Check a sample of the system water with a **TDS** (Total Dissolved Solids) Meter again looking for a reading within 10% above of the sample of mains water. (Alternatively use of a professional system analysis test kit if available is desirable) If there is any difference visible, (a difference of 10% above the figure of mains water supply and system water is considered acceptable) continue to flush system until both samples show a figure within 10% above of mains water. (Remember that the **TDS** Meter will need calibration from time to time).

24. Prochem Inhibitor can be added to the system either via the ProFlush tank before disconnecting from the system and allowed to circulate for approx 15 minutes. Alternatively the Prochem Inhibitor can be put into the system after cleaning via the header tank. (If Prochem Inhibitor is added via the ProFlush tank ensure the an adequate amount of Inhibitor is allocated to take account of the water in the ProFlush tank).

25. Close water inlet ball valve. Isolate the flushing pump from the heating system by turning off the Flow and Return Ball Valves and switch of the ProFlush.

26. Close the circulating pump gate valves and before removing the ProFlush, open the Flow valve opposite the Dump valve. This will allow the contents of the ProFlush tank to be sent out to the foul drain leaving a small amount of water in the tank. Now stop the ProFlush with the ball valves open and disconnect from the heating system allowing any water in the hoses to gravity feed back into the ProFlush tank. Remove from machine and coil up stowing in the bund tank if you have one. Restore system to normal, restoring circulation pump, radiator balance valves to original settings, removing any temporary isolating valves or caps on the Feed and Expansion tank and restore anti-gravity valve to normal operation if necessary.

27. If the F & E tank was not cleaned during the initial cleaning period as point 16, make sure it is thoroughly cleaned and disinfected before reconnecting the F & E pipes, allow the F & E tank to fill with water if Inhibitor has already been deployed. If not, put the required amount of Inhibitor into the F & E Tank and top up with water.

28. Fire up the system and check for leaks and dispel any air in the system. Balance if required.

29. When dosing with corrosion inhibitor a further test should be carried out within two hours to establish that the inhibitor is up to strength using the Prochem Inhibitor Test Kit. Always over dose the inhibitor rather than under dose if testing is not carried out.

30. The ProFlush Thermal unit is designed to be used when the internal heat source is unavailable i.e. boiler non-functioning.
The Thermal Heater unit must be plugged into a separate 13amp power supply from the ProFlush machine. Do not plug into a double extension lead for example.
To enable this unit to reach 60° Centigrade you must follow these instructions. Whilst it is recommended that the Thermal Heater is used on systems of up to 10 radiators, if you follow the instructions below you can achieve good results on systems with more radiators.

31. Switch the Thermal Heater unit on when the ProFlush has water in up to the maximum level of approximately 35 litres. When the temperature has reached 60° Centigrade the unit will switch off and the red light will come on.
At this point start the ProFlush pump. Open the valves and circulate around the system at the same time adding the Sludge Remover or Descaler through the filler aperture. The green light will again illuminate. Allow enough time for the chemical to circulate around the system and then close down all the radiators except one.
At this time you now have chemical in the whole system but only one radiator plus the circuit are open. This will enable the Heater to bring the temperature back up to a maximum of 60°.
You may, if you wish, shut down the pump and close the valves thus allowing the water in the ProFlush tank to reach temperature quicker. Once the maximum temperature has been achieved the red light will again come back on. Open the valves and then operate the pump by short cycling through the circuit and one radiator only. When that radiator becomes hot at both top and bottom isolate it and open up the next radiator on the circuit and repeat the operation.
Continue doing this to each radiator in turn until all the radiators have been dealt with. The green light on the heater will continue to come on during this process.

32. During the cleaning period it is advisable to frequently make use of the Reversing Valve to back-flush the system and maximize the amount of debris held in suspension.
When the cleaning part of the powerflushing operation has been carried out, switch the heater unit off and commence with the flushing out operation as per the operations guide section 19.

33. If using a Magmaster filter either integral or stand alone, the amount of debris collected can be checked at any time during the flush by turning of the flow and return ball valves and stopping the ProFlush machine. Unscrew the Magmaster rods from the chambers and if there is a large amount of Magnetite on the rods clean off with rubber glove clad hand into a bucket or black plastic bag for later disposal. Return the cleaned magnets to the chambers, screwing them down securely. Restart the ProFlush and open the valves to continue with the flush.