

## How to decide if vacuum impregnation or vacuum pressure impregnation is required?



Compact VI system shown above

Vacuum impregnation (VI) is a cheaper alternative to full vacuum pressure impregnation, and is suitable for low voltage AC windings, transformers and DC motor windings. VI is being used successfully on 3.3kv motors, subject to the slot portion of the coil being pressed and cured during the coil manufacturing process. For 3.3kv windings with non-pressed and cured coils, and all other HV windings (6.6, 11, 13.8kv), full vacuum pressure impregnation (VPI) is required. For DC field coils or similar with heavy taping, a longer VI time would be required, to ensure complete resin penetration. Only solventless resin should be used with these systems.

The difference between VI and VPI is the over pressure design on the VPI unit. This allows for a quicker and larger differential in pressures to ensure the faster flow of resin into difficult to impregnate windings such as high voltage windings with many layers of Mica Tape. VI units still use the difference between the vacuum (around 10mbar) up to 1 Bar pressure (i.e Atmospheric pressure) to impregnate the windings, however with over pressure design, the pressure differentials are between 10mbar (the vacuum) and the 6 bar overpressure, therefore nearly 7 bar pressure difference. It is this pressure differential that allows a much faster flow of resin.

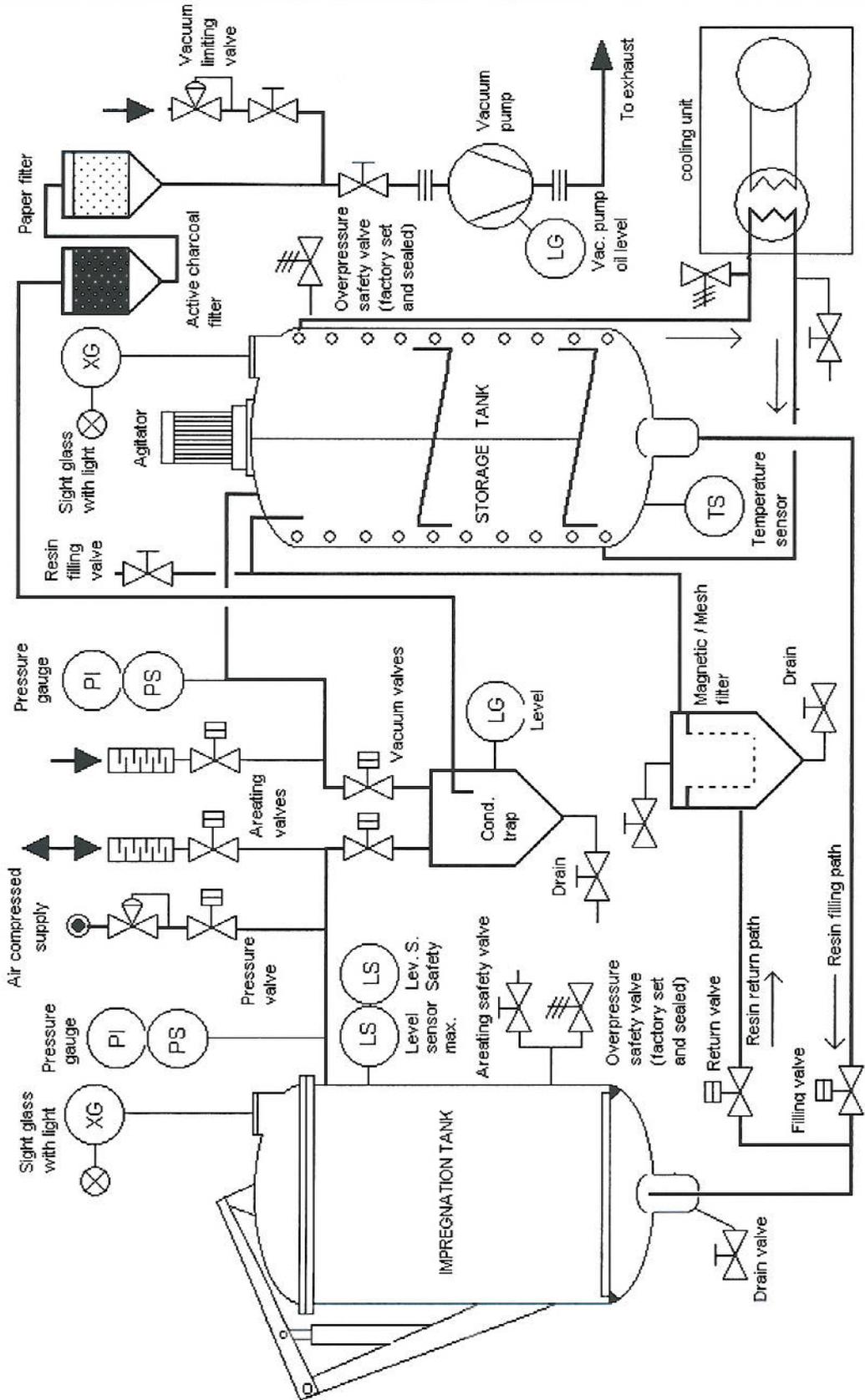


Pre-assembled monoblock VPI system above



Ideally, anyone producing HV machines, or highly taped traction machines or specialist insulating systems, would need a VPI unit. It is also, obviously, the choice for higher productivity.

A VI unit is suitable for transformer manufacturers and motor repair companies where the windings generally incorporate open windings using round or rectangular enamelled wire without large amounts of taping. A typical customer would be a transformer manufacturer who manufactures medium size 3 phase transformers, where noise reduction is a must, and the resin impregnation is imperative to ensure this. We have also sold VI units to repair companies, who would typically not do HV machines. We use the 90% rule, where if the machine is suitable for 90% of the work, it is not worth the extra investment to incorporate the final 10% that it could impregnate.



CAPACITY OF ROUND DIP IMPREGNATION TANKS IN LITRES PER 100MM



Diametre in mm		Litres per 100mm depth		Diametre in mm		Litres per 100mm depth
300		7		1700		227
500		20		1850		269
600		28		2000		314
700		38		2250		397
800		50		2500		491
900		64		2750		594
1000		79		3000		707
1200		113		3500		962
1500		177		4000		1256