DTU Vindenergi
Wind Energy Materials and Components Division
New Ring Main supply system for the materials test laboratory

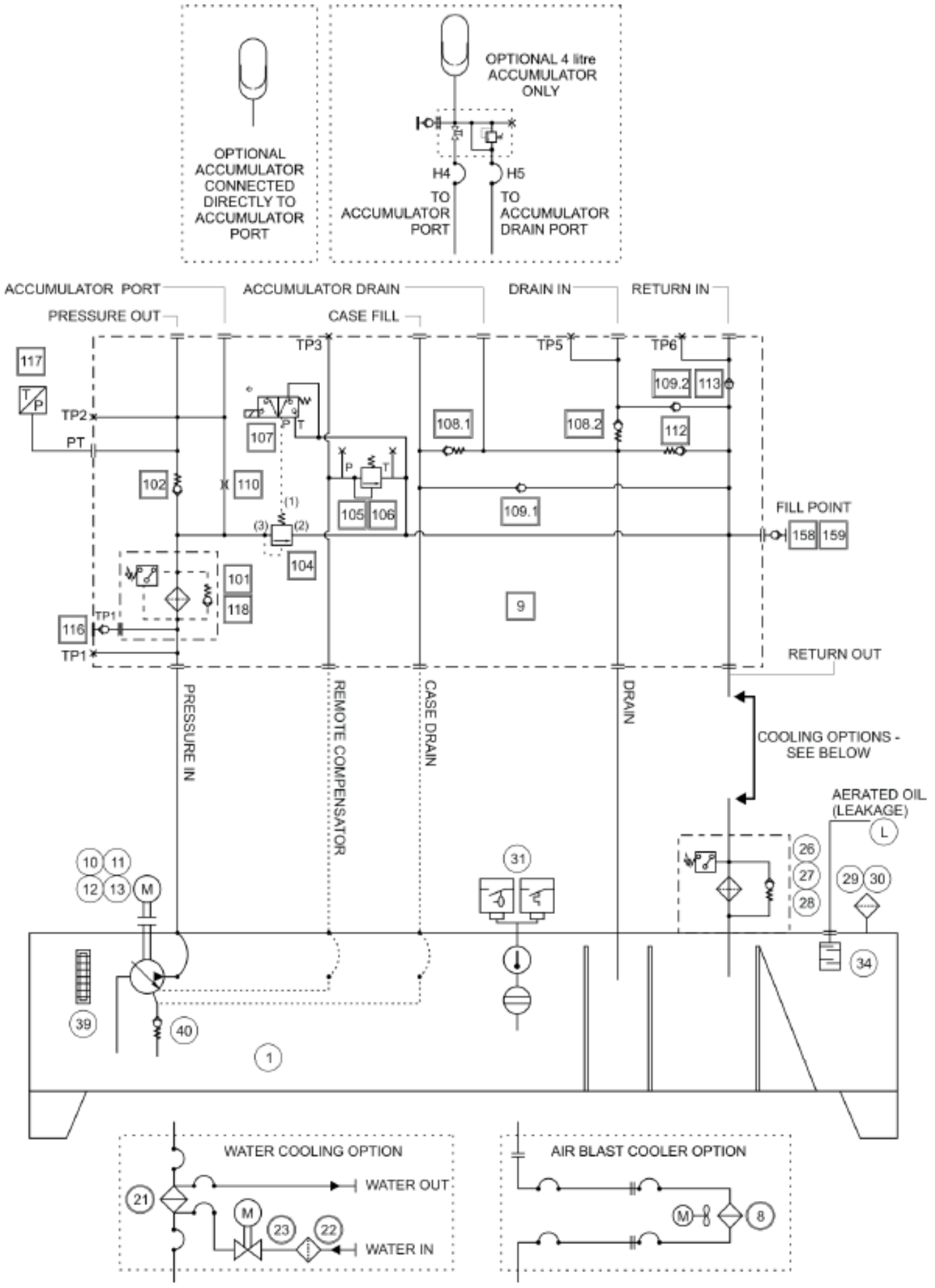
When moving the lab to a new bulding in 2022, a complete new supply system for the testing machines was needed.
PWRhydraulik was resposible for:

- Project tender tecnical documents, electical as weel as hydraulic
- Review of supplier design & documentation
- Supervice installation and start up of the ring main system
- Supervice installation and flushing of all the testmachines

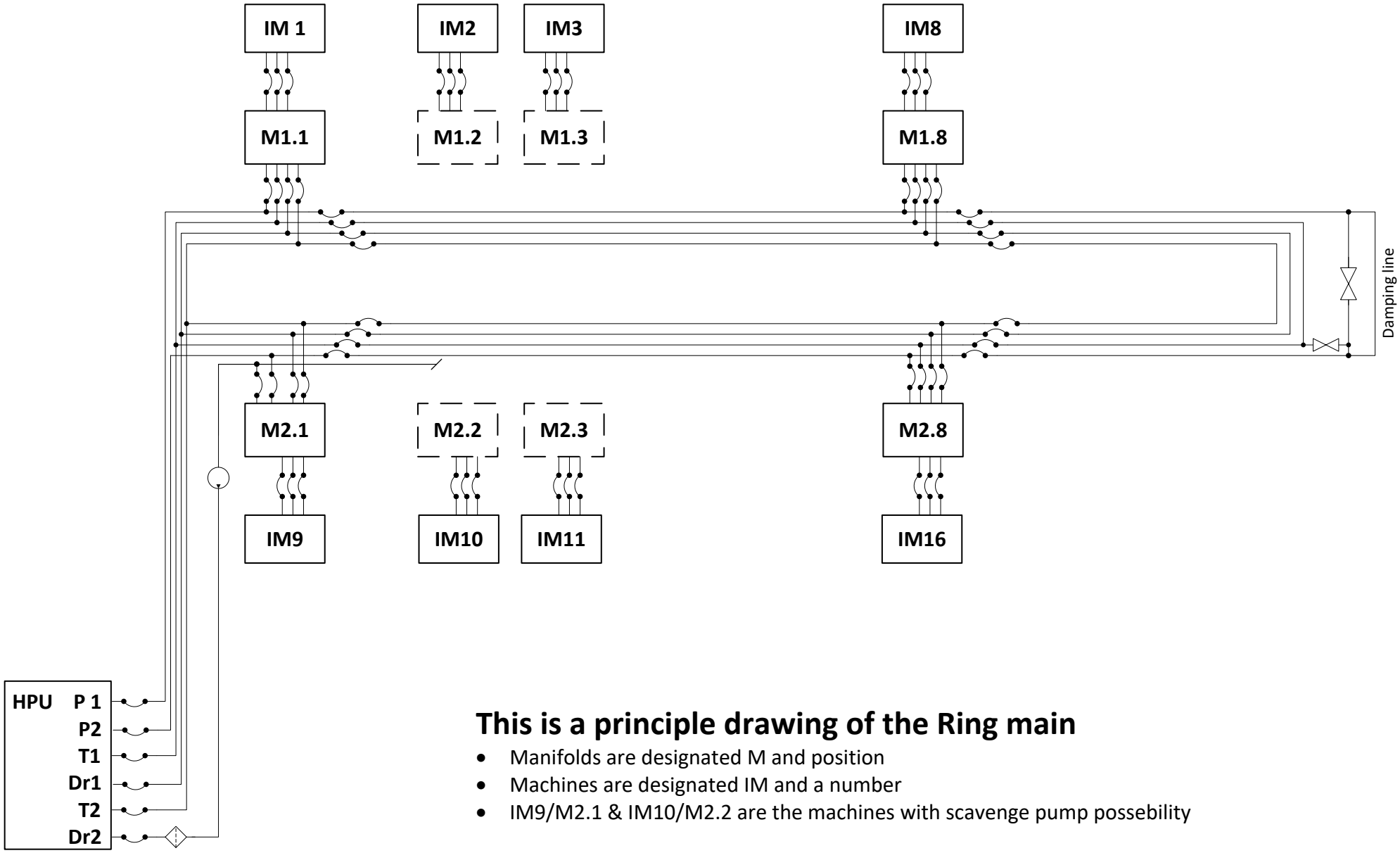
The complete system was delivered by Serman & Tipsmark

The main figures of the project

Characteristic	**Size**
HPU pressure	210-215 bar
Machine pressure	207 ± 3 bar
Return pressure maximum, farthest machine	10 bar
Drain line pressure maximum, farthest machine	10 bar
Maximum rate of change of pressure	8000 bar /sec
Current flow requirements	300 l/min
Fully expanded flow requirement	400 l/min
Oil temperature in the tank	~40 ° C
Electrical installation in HPU room	3 x400 V - 300 A
Oil type	ISO HLP 46
Purity after cleaning & flushing	ISO 15/13/10
Noise in pump room	< 85 dB (A)
Corrosion class, ISO 12944	C2
Installed power	2 x 90 kW



HPU layout example.
Elctric motor is controled by a frequency inverter



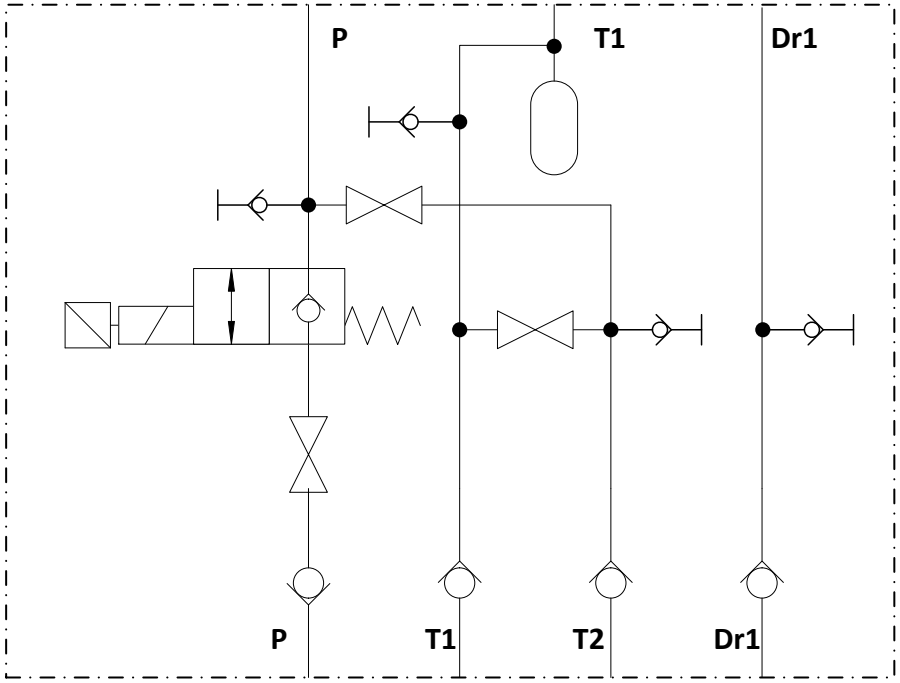
This is a principle drawing of the Ring main

- Manifolds are designated M and position
- Machines are designated IM and a number
- IM9/M2.1 & IM10/M2.2 are the machines with scavenge pump possebility

Safety manifold to be placed between the Ring main and each machine

- Soft shift on/off cartridge valve with safe position feedback
- Ball valve with detend and secured closed position in P-line
- All ball valves must have a clar position indication ”service” or ” operation”
- A accumulator pointing towards the machine in the T1 line
- M16x2 measuring poins on all lines

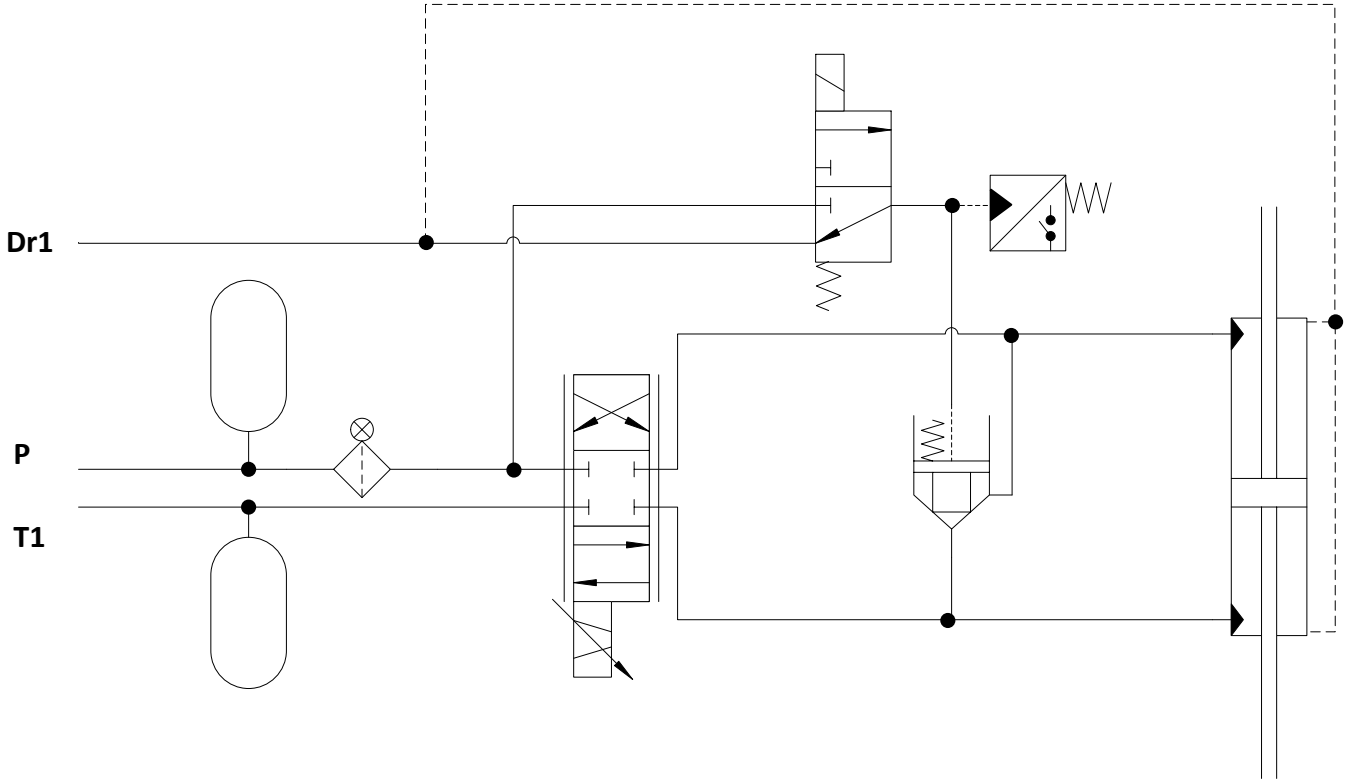
Machine side



Trench side

Principle diagram for most of the older machines

- Accumulators in p line, and also in T on some machines
- High collapse pressure filter for protection
- One or two servovalves
- By pass seat valve with pressure switch for low force operation, service & manual calibration of the machine



Operating priciple of the control system

- The operator starts the HPU. The HPU has a power management system which controls flow according to requirement.
- The operator wants to run a specific machine. He presses the start button on the machine control panel. The control signal is send to the HPU controller (in the same way as if machine & HPU was a stand allone unit).
- If the HPU is running and in a safe state, the controller opens the safety valve & the machine can start running.
- If the operator presses EM stop on the machine, the signal i routed to the HPU safety system which then does two things:
- Closes the safety valve.
- Sends the EM signal back to the machine to activate the internal safey.