Control of MVD Cooling

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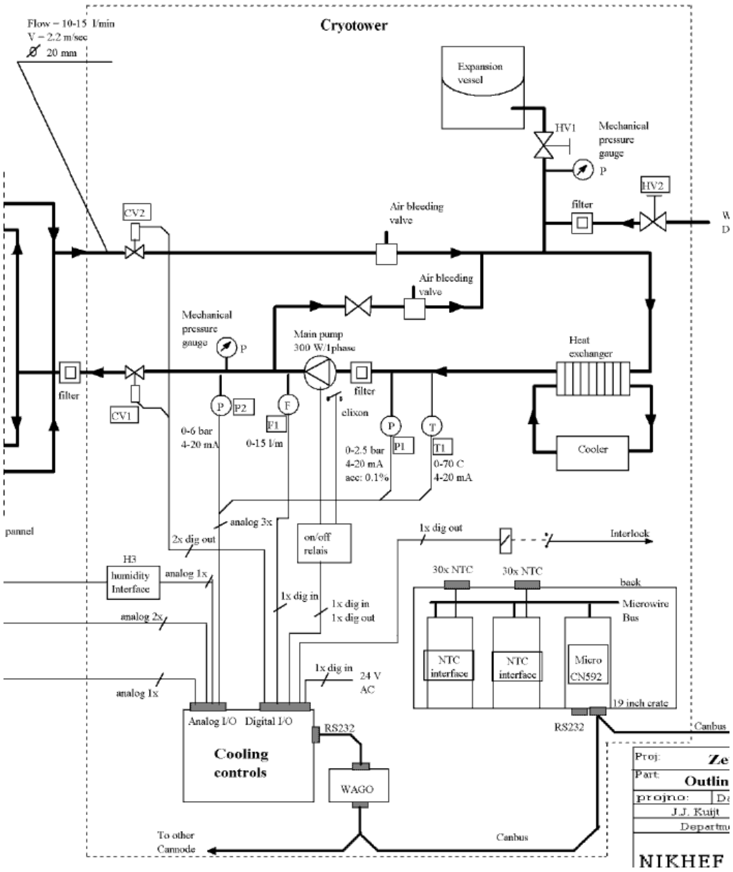
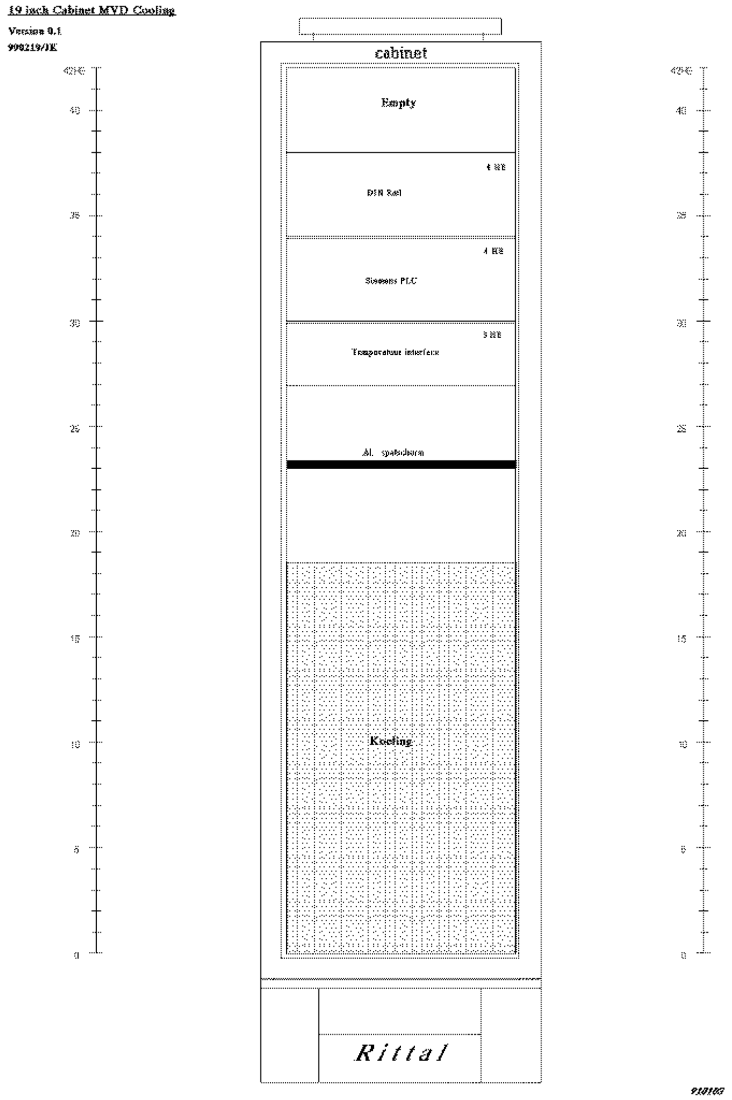
Information available via: http://www-zeus.desy.de/~wiggers/si_daq.html

- Schematics System (see transparancy)

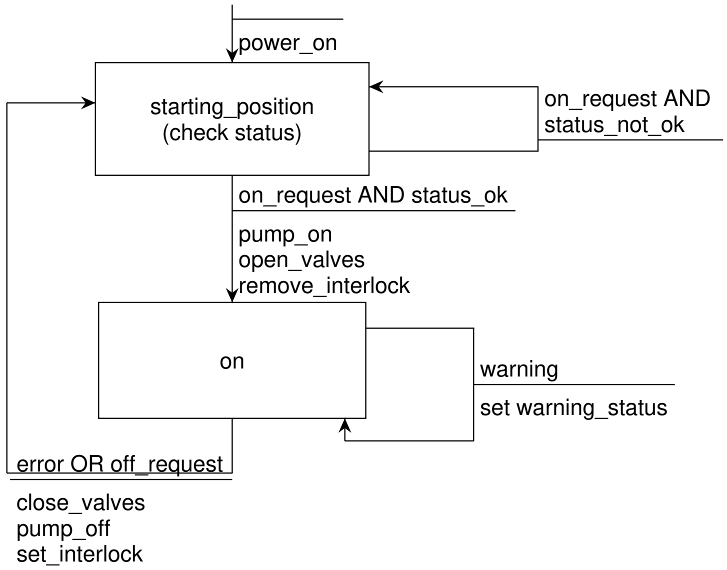


- Space/Rack requirements (see transparancy)



- State Transition Diagram (see transparancy)

Cooling system:



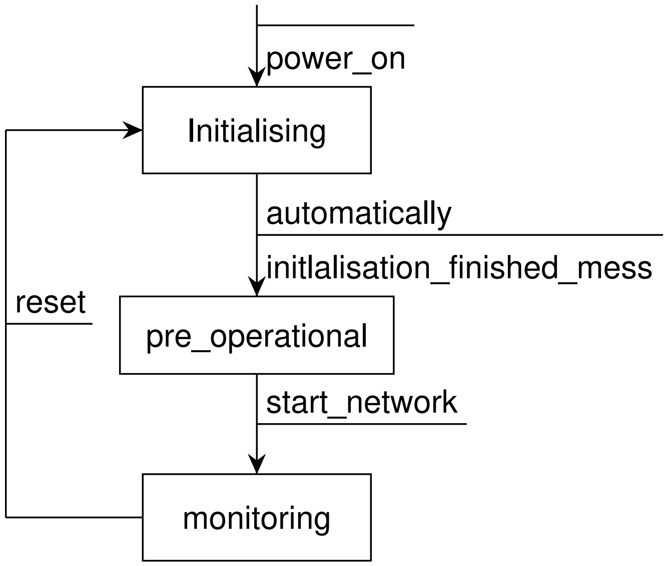
Decision Table:

States of Cooling System

States		start: all conditions	on: all conditions	off->start: all conditions	warning: any x	error->off: any -/x
check	water flow	-	x	0	0	-
	T-clixon	x	x	0	0	-
	<> warning limit T1	-	-	0	x	0
	> error limit T1	-	-	0	-	x
	<> warning limit P1 or P2	-	-	0	x	0
	<> error limit P1 or P2	-	-	0	-	x
	> warning limit H2-H1	-	-	0	x	0
	> error limit H2-H1	-	-	0	-	x
	> warning limit H3-H1	-	-	0	x	0
	> error limit H3-H1	-	-	0	-	x
	< warning limit airflow	-	-	0	x	0
	< error limit airflow	-	-	0	-	x
action	switch CV1/CV2	0	x	-	0	0
	switch pump	0	x	-	0	0
	interlock output	-	x	-	x	x

-: FALSE/CLOSED/OFF, x: TRUE/OPEN/ON, 0: INDIFFERENT/NO-ACTION

Generic CAN system:



- Interlock (open):
  - error: interlock set and error status set
  - system off: interlock set
  - possibility of delaying interlock $\Longrightarrow$ gentle landing of MVD system
- Sensor Variables:
  - temperature sensor after heat exchanger: T1
  - humidity sensors: H1, H2 and H3
  - pressure sensors: P1 and P2
  - airflow
  - warning/error should produce yellow box
  - errors detected by polling by the CAN node; time defined by update frequency (0.1 s)
- Can messages (via CAN node; see talk Henk Boterenbrood):
  - Read ErrorStatus Word
  - Read WarningStatus Word
  - Command SetCoolingOn
  - Command SetCoolingOff

  - Read StatusCooling
  - Read Data
  - Command SetParameters
  - Read Parameters
- Histogram requirements
  - Update frequency 5-10 s
  - Storage of averaged values per 10-15 minutes
- Configuration ;
  - Trip levels: minimum and maximum values for warning and error
  - Exclusion of sensors if not working (to be implemented $\longrightarrow$ extra CAN messages: Set SensorConfiguration and Read SensorConfiguration)
  - Configuration stored locally in PLC
  - Operator can change configuration
  - On host machine storage of copy for checking
  - System should be robust; no further programming required
- Logging
  - Storage of warnings/errors for 10 days
- Data
  - No need of putting info in the data stream (no use in data-analysis)
- Status:
  - HW available; airflow sensor to be selected
  - Programming of software