19 – Magnet - Current leads cooling

**Sensors and actuators used:**

- Temperature: TT654, TT655, TT656, TT657 and list in the table 1

- Flow rate: FT650, FT651, FT652, FT653,

- Valve: FV587,

- Control valve: CV650, CV651, CV652, CV653, - these valves are not controlled directly but by setting the required flow rate (max flow rate is 3.0 m3/h)

- Heater: list in the table 1

|  |  |
| --- | --- |
| **The user chooses:** | **Initial conditions:** |
| - Temperature: TT654setpoint, TT655setpoint, TT656setpoint, TT657setpoint and list in the table 1 | - Magnet insert selected  - Sequences from 1 to 3 stopped |
| - Flow: FT650setpoint, FT651setpoint, FT652setpoint, FT653setpoint, |  |
|  |  |
| - Mode: Temperature or Flow regulation. |  |

start

Current lead IL651

stop

Cooling in operation

FT650 regulated

TT654 = TT654setpoint OR

FT650 = FT650setpoint

FV587 opened

Gas and Current lead

heating

EH650A regulated

TT650 = TT650setpoint

EH650B regulated

TT650 = TT650setpoint

stop

Cooling in operation

FT651 regulated

TT655 = TT655setpoint OR

FT651 = FT651setpoint

FV587 opened

Gas and Current lead

heating

EH651A regulated

TT651 = TT651setpoint

EH651B regulated

TT651 = TT651setpoint

(FT650&FT51&FT652&FT653) set to 0

Current lead IL650

Stop

Open the cooling circuit

FV587 open

FV587 closed

Stop

cooling

FT650 closing with slope

FV587 opened

Stop

cooling

FT651 closing with slope

FV587 opened

Close the cooling circuit

FV587 closed

A

B

Current lead IL652

Current lead IL653

Stop

Cooling in operation

FT652 regulated

TT656 = TT656setpoint OR

FT652 = FT652setpoint

FV587 opened

Gas and Current lead

heating

EH652A regulated

TT652 = TT652setpoint

EH652B regulated

TT652 = TT652setpoint

Stop

Cooling in operation

FV653 regulated

TT657 = TT657setpoint OR

FT653 = FT653setpoint

FV587 opened

Gas and Current lead

heating

EH653A regulated

TT653 = TT653setpoint

EH653B regulated

TT653 = TT653setpoint

Stop

cooling

FT653 closed with slope

FV587 opened

Stop

cooling

FT652 closing with slope

FV587 opened

A

B

Table 1: List of the heaters with the thermometers used to their control

|  |  |  |
| --- | --- | --- |
| Heater | Thermometer | Temperature setpoint |
| EH650A  EH651A  EH652A  EH653A  EH650B  EH651B  EH652B  EH653B | TT650  TT651  TT652  TT653  TT650  TT651  TT652  TT653 | TT650setpoint  TT651setpoint  TT652setpoint  TT653setpoint  TT650setpoint  TT651setpoint  TT652setpoint  TT653setpoint |