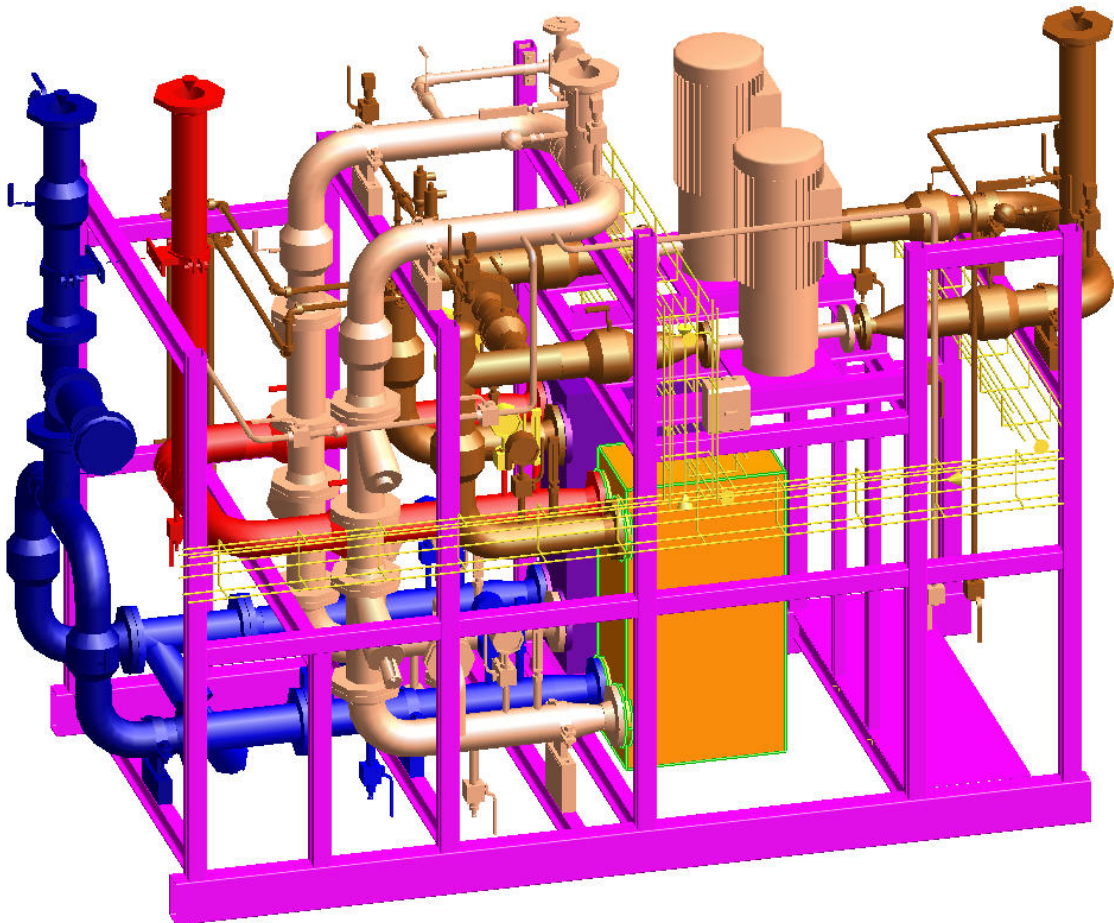


Plantware

Functional Description **=H03** Central Heating Production

Revision:
01/2010-10-27/CP/HN
01a/2018-08-25/CP/XX



Functional Description =H03 Central Heating Production

Revision:
01/2010-10-27/CP/HN
01a/2018-08-25/CP/XX

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Functional Description **=H03** Central Heating Production

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1. Change Log

Revision 01

Issued for commenting and design review.

Revision 01a; 2018-08-25

This revision contains the following changes:

- Alarm Definition Added
- Measuring Signal Definition Updated.

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2. Objective

The objective of this FU is supplying central heating to the whole building.

3. Standardization

This Functional Unit contains the following Control Loop Blocks:

- PC101
- TC101

PC101

Standard Pressure Control of 2 x 70% pumps with operation release by separate pressure measurements.

TC101

Standard Temperature Control of 1 or more Heat Exchanger in parallel with temperature adjusted based on ambient conditions.

4. Specific Value

This is a verbal description of the function and all specific values will be generated in list from the engineering database.

5. PID

The FD contains of the following PIDs:

- =H03.HD02.CENT.HEAT.PROD
- =H03.HD04.CENT.HEAT.CIRC

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6. Connected functional units

The following functional units interact with current functional unit:

- =H01: District Heating – Main Supply
- =H03.KG02: Expansion System

7. Modes

This functional unit has the following operation modes:

- Normal
- Summer / off

Summer / off Mode

Then pumps, fans and other rotating equipment shall start and run for 5 minutes once every week:

- Load 100% for non-VSD operated
- Load 40% for VSD operated.

8. Control loops

There is one control loop in this functional unit:

- Temperature, forward heating
- Pressure, forward heating

Temperature

Temperature is controlled via Control Valve for District Heating =H03.HD02.QNA01 via temperature measurement =H03.HD04.BTA31. The regulation is offset based on data input from overall weather station and compensated for

- Ambient Temperature
- Ambient Wind Speed

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The temperature regulation is following a curved with these two off initial fix points

- Ambient temperature -12°C, Wind Speed < 5 m/s: 55°C
- Ambient temperature 15°C, Wind Speed < 5 m/s: 25°C

Pressure

Pressure is controlled via pump VSD =H03.HD04.GPA11-G01 and =H03.HD04.GPA21-G01 via pressure measurement =H03.HD04.BPA21.

The two off pumps shall alternate on a weekly basis and operate like this

- Load 0 – 70%; One off pump in operation
- Load 71-100%; Two off pump in operation

9. On/off Controls

There are two on/off control in this functional unit:

- District Heating Supply Heat Exchanger 1
- District Heating Supply Heat Exchanger 2

Heat Exchanger 1

The valve =H03.HD02.QNA12 shall be closed when the Pump =H03.HD02.GPA11 is not in operation.

Heat Exchanger 2

The valve =H03.HD02.QNA22 shall be closed when the Pump =H03.HD02.GPA21 is not in operation.

10. Interlocks

There are the following interlocks

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- Minimum pressure in heating water system halts pump operation
- Expansion System shall be on.

Minimum Pressure

The minimum water pressure shall be above minimum to release pump start-up measured at:

- =H03.HD04.GPA11: =H03.HD04.BPA11
- =H03.HD04.GPA21: =H03.HD04.BPA21

Expansion System

The Expansion System =H03.KG02 shall be on and in operation.

11. Trips

There are the following trips in the unit:

- Minimum pressure in the heating water system

Minimum Pressure

If either =H03.HD04.BPA11 or =H03.HD04.BPA21 falls below minimum for the time range specified the whole functional unit trips.

12. Safety Issues

There are no safety issues for personal health and safety, and the functional unit shall not be equipped with Emergency Stop Function.

13. Fail mode

All valves are failsafe/close type.

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14. Signal transfers

There are the following signal transfers:

Alarms

There are the following alarms for the unit:

- Low Pressure – P_{Low}: =H03.HD04.BPA11 – Level 2
- High Pressure – P_{High}: =H03.HD04.BPA11 – Level 3
- Low Pressure – P_{Low}: =H03.HD04.BPA21 – Level 2
- High Pressure – P_{High}: =H03.HD04.BPA21 – Level 3
- Low Pressure – P_{Low}: =H03.HD04.BPA31 – Level 3
- High Pressure – P_{High}: =H03.HD04.BPA31 – Level 3
-

Measuring

The following signals shall be made available for the overall BMS:

- Pressure: =H03.HD04.BPA11
- Pressure: =H03.HD04.BPA21
- Temperature: =H03.HD04.BTA31
- Pressure: =H03.HD04.BPA31
- Load VSD =H03.HD04.GPA11-G01
- Load VSD =H03.HD04.GPA21-G01
- Electrical Consumption for the FD

15. Alarm Definition

There are the following alarm levels:

- Level 1 - Critical
- Level 2 - Important
- Level 3 - Information
- Level 4 - Information

Alarm Level 1

This alarm is critical and sets off the following actions:

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- SMS Alert to FM Main Cell Phone
- Red Light Flashing in Control Room
- Red Marking in SCADA Operation Screen
- Registers in the Log

Alarm Level 2

This Alarm Level sets off the following actions

- Red Light Flashing in Control Room
- Red Marking in SCADA Operation Screen
- Registers in the Log

Alarm Level 3

This Alarm Level sets off the following actions

- Red Marking in SCADA Operation Screen
- Registers in the Log

Alarm Level 4

This Alarm Level sets off the following actions

- Red Marking in SCADA Operation Screen

16. Recipes

No for this functional unit.

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17. Operation of unit

Start-up

No specific Start-Up procedures. Whenever all interlocks are freed the unit can start.

Operation mode

Shall always be on.

Stopping

No specific Stopping procedures.

18. DCS (*)

PLC programming

Pending