

Vertical Continuous Pan and Condenser Automation



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YUTECH

**Servicing the Sugar Industry
since 1978**

VCP Automation



Automatic VCP Process Control Systems:

- **Seed Flow Control with respect to Syrup / Masecuite Flow.**
- **Auto Feeding of Syrup to each Compartment based on Brix Sensing to maintain Preset Brix.**
- **Auto Selection of Syrup / Water depending on Brix**
- **Steam Control wrt Brix / Stirrer Wattage**
- **Callendria Vapour / Heating Steam Pressure Control.**
- **Overall Pan Vacuum Control by Condensor Automation.**
- **Masecuite Overflow Control wrt Compartment Brix.**
- **Masecuite Bottom Drain Control wrt Brix into next Compartment**
- **Bypass next Compartment and send material to other compartment wrt Level / other abnormal condition of next Compartment**
- **Wash Water and Wash Steam Intake after Material Discharge**
- **Intake of Fresh Material from Previous or Earlier Compartment and repeat procedure**

Vertical Continuous Vacuum Pan Automation:



- **Seed / Magma Flow Control with respect to Molasses / Liquor Flow**
 - Molasses and Seed Flowmeters sense Flow.
 - Ratio Controller delivers exact Flow of Seed wrt Molasses Quantity by Controlling Magma Pump VFD.
- **Individual Compartment Brix Control by Auto Feeding of Molasses / Water into each Compartment**
 - Brix Sensing of each Compartment by YUTECH Brix Analyzer for exact Brix Measurement
 - Control of Molasses Intake Valve wrt Brix Set Point and Sensed Value in a PID Mode
 - Addition of Water if Brix are higher than Set Point. This Logic is Built in the PLC / DCS.

Vertical Continuous Vacuum Pan Automation:



- **Vapour Control with respect to Brix or Vapour Pressure**
 - With Thickening of Massecuite Heating Requirement reduces
 - We are already Sensing Brix of each Compartment which is directly proportional to Thickening of the Massecuite
 - We are also measuring the Wattage of Stirrer or Circulator Drive which is also directly proportional to Thickening of the Massecuite
 - Vapour Control Valve is also considered, hence we can Control the Steam Intake wrt Brix and Wattage of Stirrer Drive
 - We can also restrict the Vapour Valve closure (Say never to close below 20%) as required
 - This Loop can be fine tuned during commissioning
 - Alternately the Vapour Valve will be Controlled wrt Vapour Pressure

Continuous Vacuum Pan Automation:



Overall Pan Vacuum Control by Condenser Automation is explained in later part

Massecuite Overflow Control wrt Compartment Brix:

- Control Valve is provided or Massecuite Overflow to the next Compartment this loop works in direct proportion to Compartment Brix

Massecuite Bottom Drain Control wrt Brix into next Compartment:

- On / Off Type Valve is provided for Massecuite Drain to the next Compartment Valve Operates when Compartment Brix Preset Value is attained.

Continuous Vacuum Pan Automation:



Bypass next Compartment and send material to other compartment wrt Level / other abnormal condition of next Compartment:

- If next Compartment is unable to receive Masecuite due to any reason like maintenance / if its already Full etc., that Compartment can be Bypassed and material given to next compartment. This will automatically be interlocked with next compartment Level and Stirrer Motor On Condition.
- This is optional and can be built in

Wash Water and Wash Steam Intake after Material Discharge

- On/Off Valves provided for Wash Water and/or Steam Intake

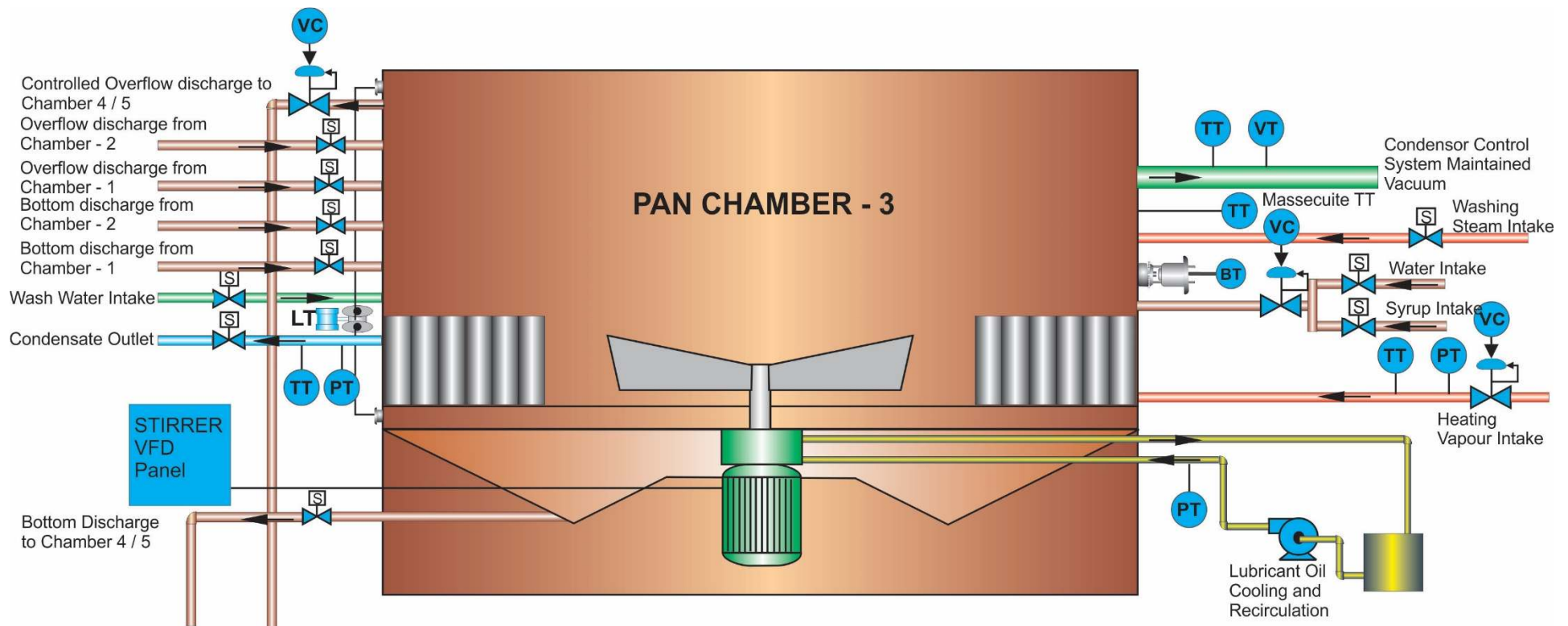
Intake of Fresh Material from Previous or Earlier Compartment and repeat procedure

- On/Off Valves provided for Material Intake / Bypass from previous Compartment/s

VCP Automation

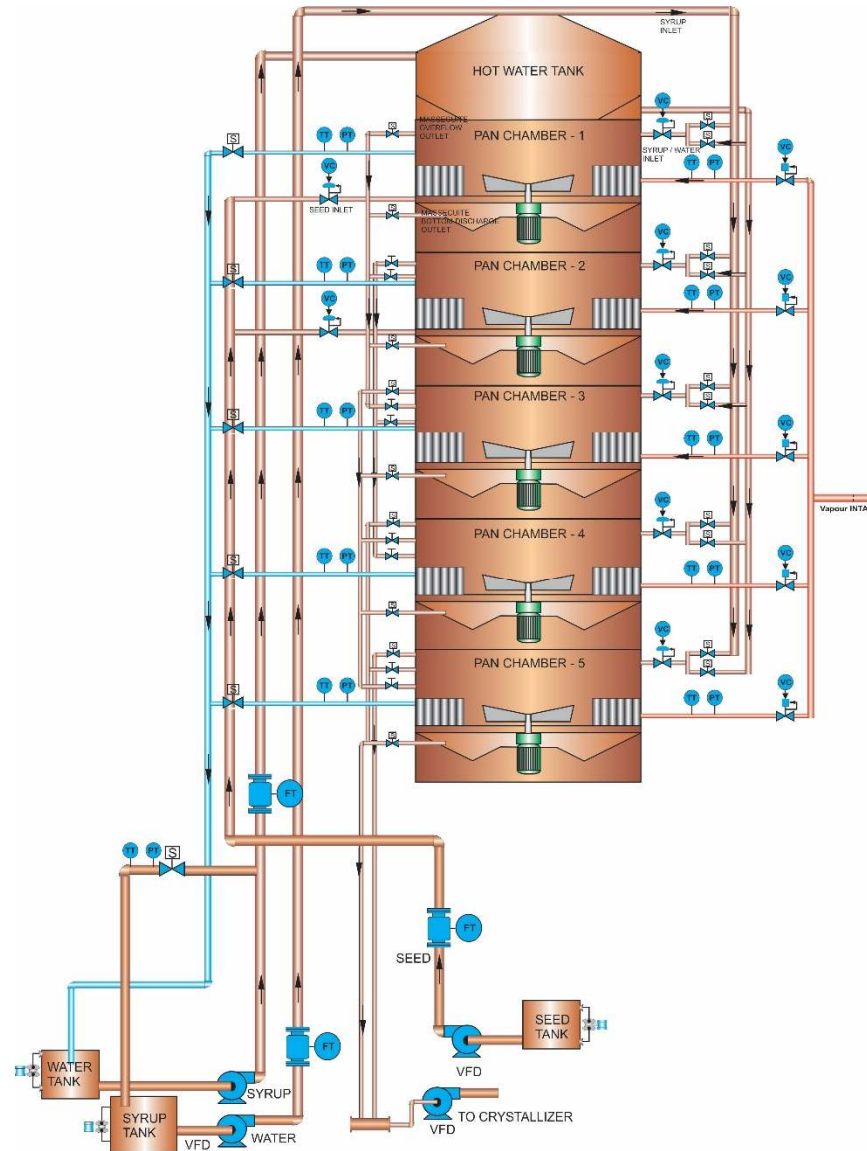
Automatic VCP Process Control Systems:

Schematic Diagram: Automatic Control Systems of each Compartment



VCP Automation

Automatic VCP Process Control Systems:



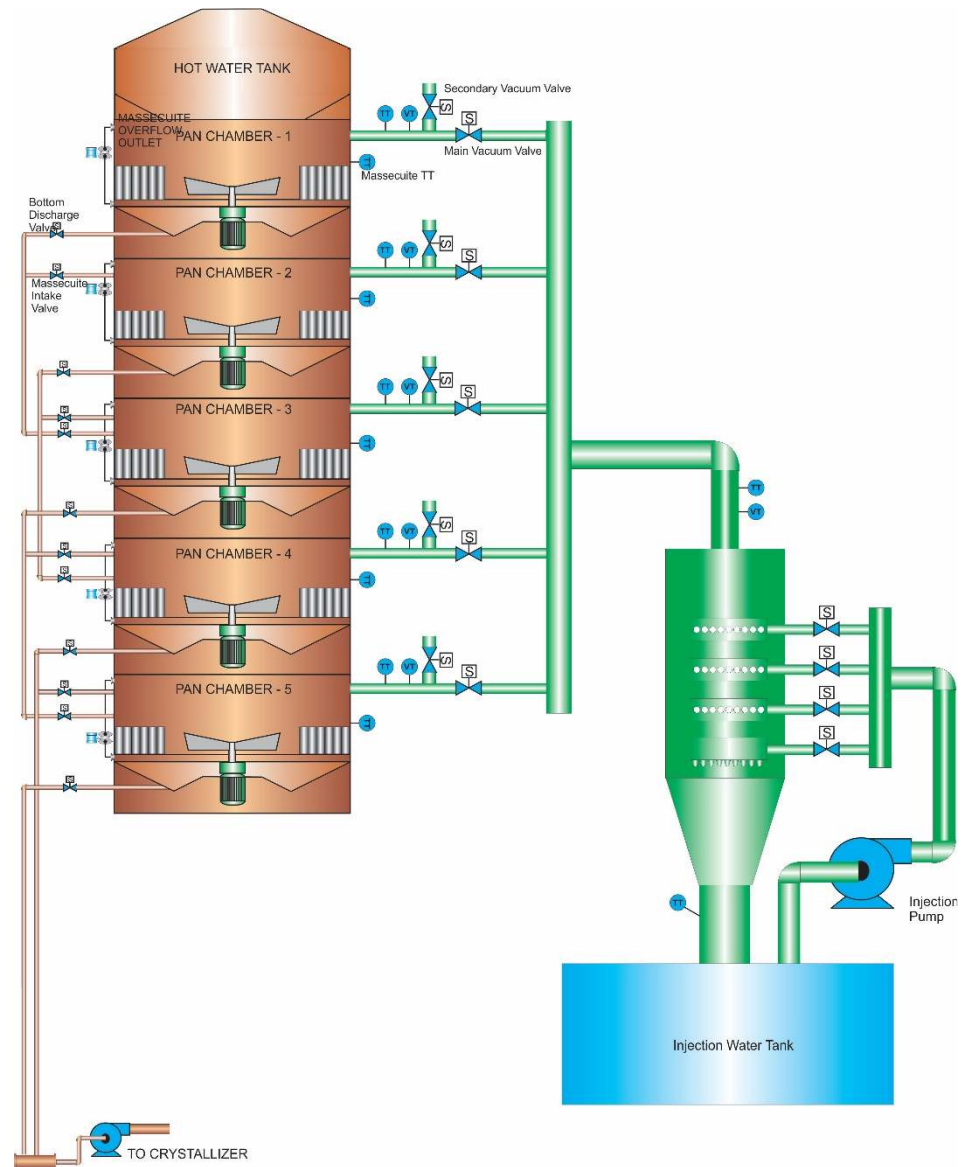
Principle of Condenser Automation



- When Vapours Condense and Mix with Injected Water and Exit through the Tail Pipe, it creates a Void and Generates Vacuum.
- As Masecuite Level in Pan rises, Rate of Evaporation Reduces and therefore Water Quantity to create Vacuum also reduces. As such flattening out the Curve of Vacuum Generation. Thus any Extra Water used after this point is a Wastage.
- Condenser Automation facilitates Required Vacuum Generation using just Optimum Water and Power, thus reducing Wastage of Excess Energy and Water.

VCP Automation

Automatic VCP Process Control Systems:



Condenser Box



- Multiple Entry Condenser Box.
- Separate Compartment for Different Sets of Spray Nozzles and Spray Jet.
- Number of Jets & Nozzles and Jet & Nozzle Diameters designed as per Condenser Capacity.
- Complete Stainless Steel Construction.
- Strainer provided for each Condenser Header.
- Each Nozzle Compartment Controlled by Separate Valve.
- Jet Compartment Controlled by Separate Valve.

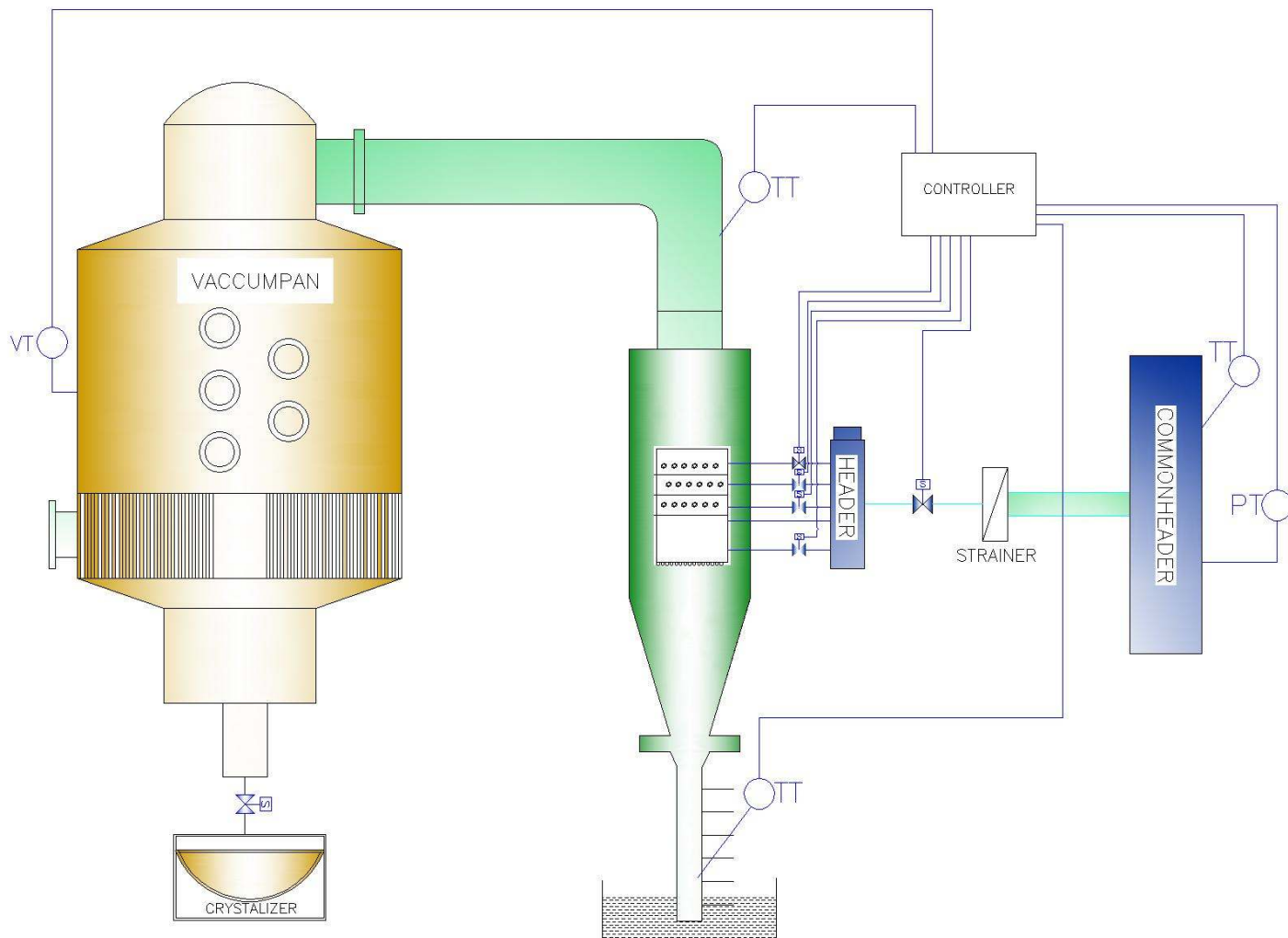
Condenser Box



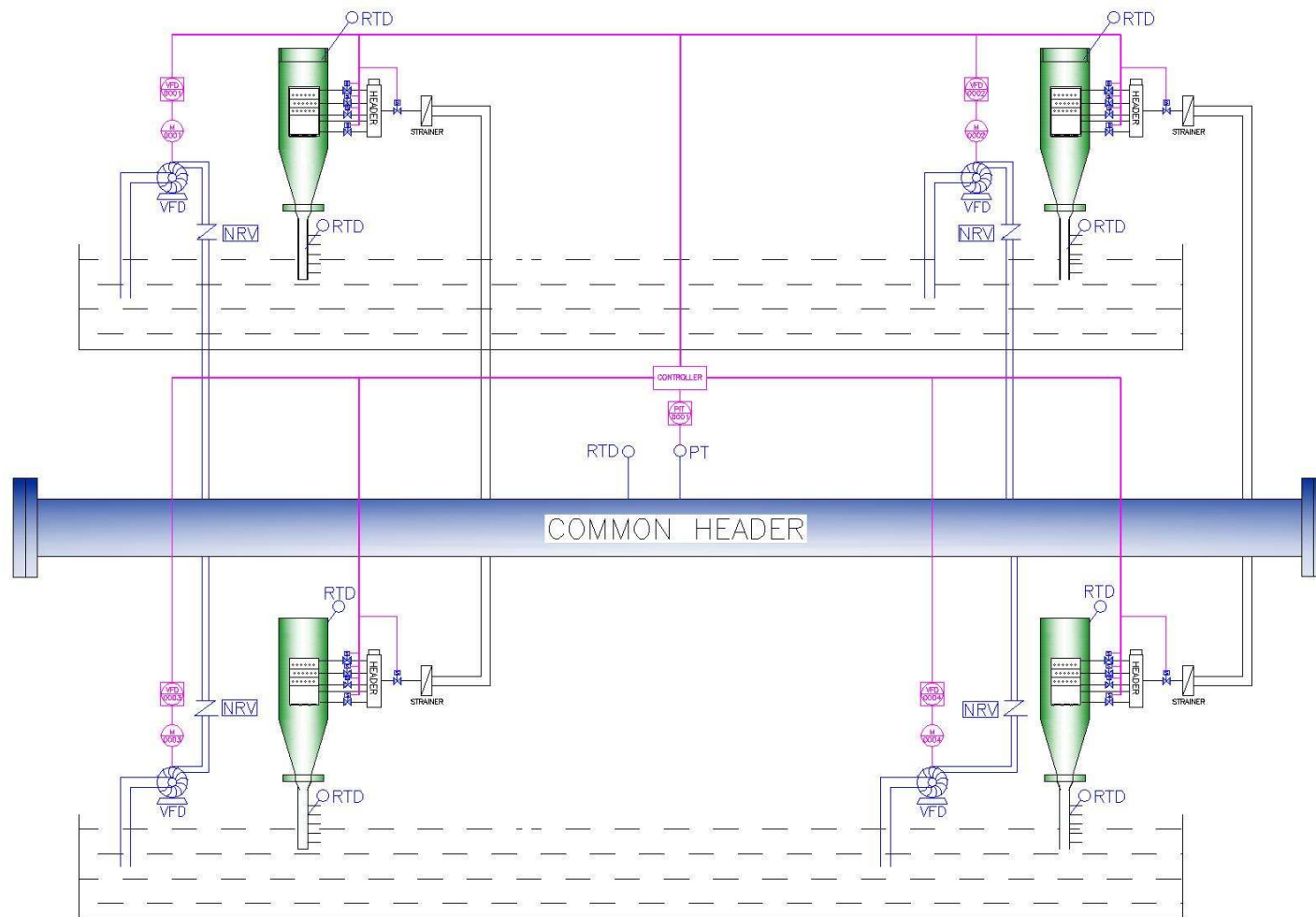
- Water Quantity Automatically Controlled to by Nozzle Compartment Valve wrt Vacuum.
- Vapour and Tail Pipe Temperature Measured.
- Water Pressure in the Common Injection Header maintained by Controlling Injection Pump VFD.
- Power and Water Saving due to Controlled intake of Water.
- Facilitate Optimum Capacity Utilization.

- Toggle between Main Vacuum Line and Secondary Vacuum Line is facilitated by providing Two On / Off Valves. So either of the Vacuum Line can be selected.
- This Facility is given to allow the compartment Vacuum to reach its optimum value after compartmental maintenance / closure.
- This will not disturb the entire Pan Vacuum when a body with difference in Vacuum is introduced in the system.

Condenser Automation



Condenser Automation



THANK YOU!
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REDUCE CARBON FOOTPRINT
MAKE THE WORLD GREENER

AND YET, MAKE MONEY