

# SUGAR MELTER AUTOMATION MOLASSES CONDITIONER AUTOMATION BASED ON YUTECH FLUID-DENSITY-BRIX ANALYZER CUM CONTROL SYSTEM AND MOTORIZED FLUID-DENSITY SENSOR

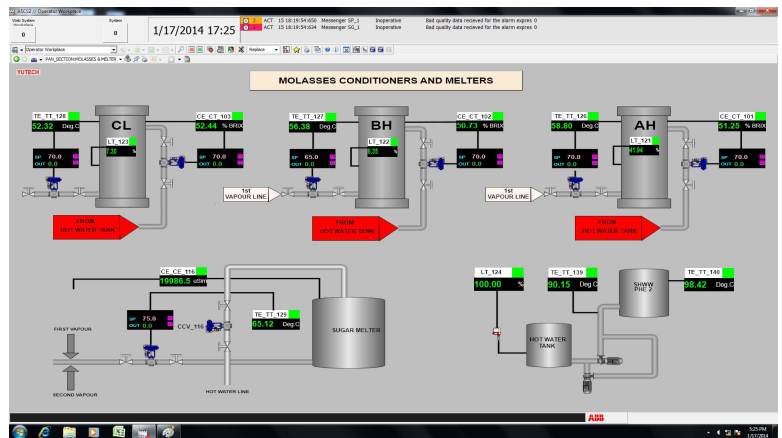


**YUTECH**

## FLUID-DENSITY-BRIX ANALYZER AND CONTROL SYSTEM WITH FLUID-DENSITY SENSOR



## SCREENSHOT: SUGAR MELTER AUTOMATION MOLASSES CONDITIONER AUTOMATION



### Sugar Melter Automation Advantages:

- Streamlined Process due to Constant and Maintained Outlet Brix and Temperature.
- Ensure Constant Quality of Melt Feed to Pans.
- Reduce Heat Waste, due to Overheating or Under Dilution or Over Steaming.
- Reduce Process Time by avoiding Extra Dilution.
- Thus Save Time, Steam, and Water and Ensure more throughput in less time.
- Increase Profitability.

### Control Loops:

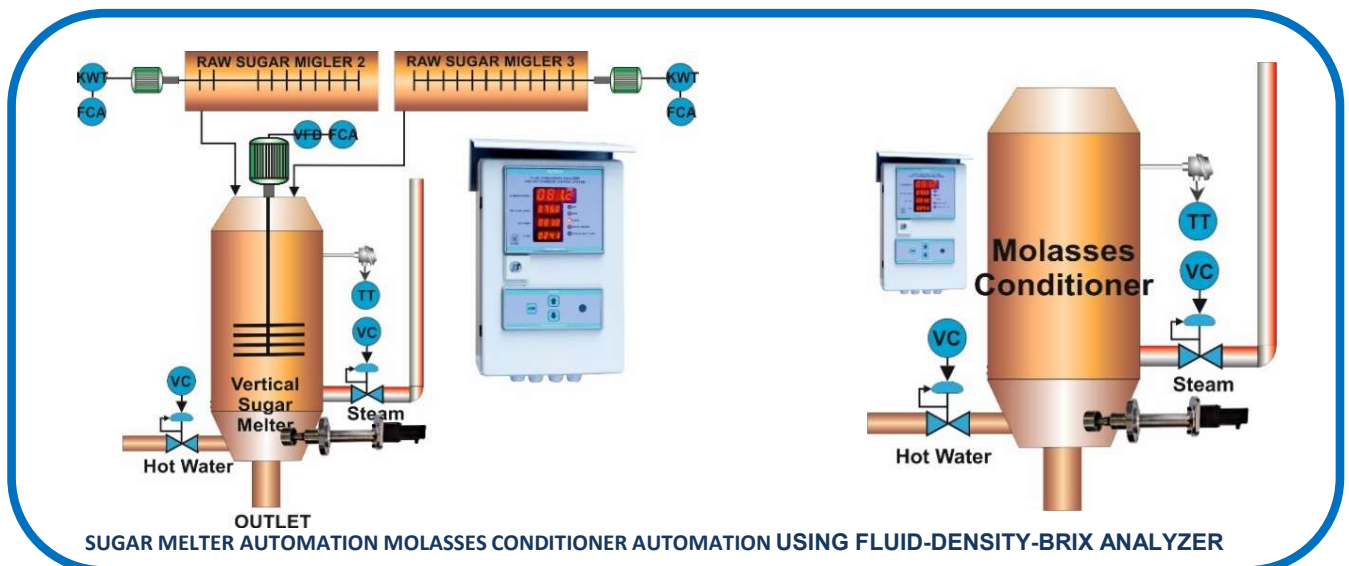
Controlled intake of Heating Media (Steam), and Diluting Media (Water) as per Process Dynamics of Raw Sugar Intake.

### Brix Control using Brix or Fluid-Density-Brix Analyzer:

- Sugar Melt Brix are maintained by the controlled addition of Hot Water using a Control Valve in a PID Loop with Sugar Melt Fluid-Density-Brix / Brix sensed by a Fluid-Density-Brix Analyzer or High-Frequency Brix Analyzer as a Process Variable.

### Temperature Control:

- Sugar Melt / Molasses Temperature is maintained constant by controlled application of Steam using a Control Valve in a PID Loop with Sugar Melt / Molasses Temperature as a Process Variable.



# SUGAR MELTER AUTOMATION MOLASSES CONDITIONER AUTOMATION

## BASED ON YUTECH FLUID-DENSITY-BRIX ANALYZER CUM CONTROL SYSTEM AND MOTORIZED FLUID-DENSITY SENSOR



### Molasses Conditioner Automation Advantages:

- Streamlined Process due to Constant and Maintained Outlet Brix and Temperature.
- Ensure Constant Quality of Melt Feed to Pans.
- Reduce Heat Waste, due to Overheating or Under Dilution or Over Steaming.
- Reduce Process Time by avoiding Extra Dilution.
- Thus Save Time, Steam, and Water and Ensure more throughput in less time.
- Increase Profitability.

### Control Loops:

Molasses Conditioner and Sugar Melter are the same Equipment thus their controls remain the same. The difference is in the material processed i.e., Molasses or Sugar Melt, and its Brix Set Point. The Loops are explained earlier under the Sugar Melter Control Loops heading.

### BASIC SCIENCE BEHIND FLUID-DENSITY-BRIX:

- **Fluid-Density:** the Density of a particular Fluid.
- **Density:** is defined as “**Mass per unit volume**”, which means it is the Mass contained in a fixed volume. It is denoted by “ **$\rho$** ” which is a Greek Letter called “**Rho**”.
- **Density** can be derived using the formula “ **$\rho = m/v$** ” where  $\rho$  is the Fluid-Density, m is the Mass and V is Volume. The unit to measure Fluid-Density is  **$kg/m^3$**  (Kilogram per cubic meter).
- **Brix:** the measurement in percentage by weight of sucrose in pure water solution.
- Online Direct measurement of Brix in a Process Fluid is difficult, so indirect methods are used.
- **The most popular ways of measuring Brix are:**
  - **Hygrometric and Refractometric (Lab Methods)**
  - **High-Frequency or Radio-Frequency Conductivity type Brix Sensing**
  - **Microwave Type Brix Sensing**
  - **Fluid-Density Type Brix Sensing**
- While Conductivity or Microwave methods are very successful in measuring Brix of “B and C” Masecuite in CVP, Brix of Sugar Melt, and Brix in a Molasses Conditioner unit, they cannot measure Brix of “A” Masecuite as we measure the Fluid’s electrical quality which is variable.
- Fluid-Density Measurement using a Motorized Stirring Sensor proves very successful as it directly measures the Fluid’s mechanical quality irrespective of its electrical characteristics. Thus, measured Fluid-Density Value is further processed in the **Fluid-Density-Brix Equation**, to derive **Fluid-Density-Brix**.

### SALIENT FEATURES OF FLUID-DENSITY-BRIX ANALYZER SYSTEM:

- Fluid-Density Type Brix Analyzer System targets sensing the Fluid-Density of Liquids, Slurries, or Syrups like Sugar Masecuite, Sugar Syrup, Sugar Melt, Liquors, and Molasses.
- The Motorized Fluid-Density Sensor is specially designed to be inserted in a vessel to stir the Fluid Media and Measure its Fluid-Density which can be expressed in simple terms as the Tightness or Thinness of a Fluid Media. It can also be informally referred to as the Consistency of the Fluid and is a Mechanical Property of a Fluid which in Liquids is directly proportional to its Viscosity.
- Motorized Sensor’s torque and power which is required to stir the Fluid varies with varying Fluid-Density.
- The Motorized Fluid-Density Sensor’s Power Consumption is directly proportional to the Fluid’s Density.
- The variation in the Motorized Fluid-Density Sensor’s Power Consumption is sensed by the Fluid-Density Type Brix Analyzer’s highly accurate Sensing Circuitry, this deviation is further processed to Derive the Raw Fluid-Density Value.

FOR MORE DETAILS ON THE FLUID-DENSITY-BRIX ANALYZER AND CONTROL SYSTEM WITH FLUID-DENSITY SENSOR DOWNLOAD THE BROCHURE FROM OUR WEBSITE.

FOR MORE DETAILS, PLEASE SEE THE PRESENTATION ON OUR WEBSITE [www.yutechautomation.com](http://www.yutechautomation.com).

CHANNEL PARTNER:

**YU Technologies Pvt. Ltd.**

HO & Works: B 8/5, MIDC, Miraj, 416 410, Distt: Sangli, Maharashtra, India.

T: +91 233 2644042, +91 916 832 4851, +91 916 832 5127 / 8.

E: [info@yutech.in](mailto:info@yutech.in); [sale@yutech.in](mailto:sale@yutech.in) W: [www.yutech.in](http://www.yutech.in); [www.yutechautomation.com](http://www.yutechautomation.com)