YUTECH

YUTECH pH ANALYZER

AND

pH CONTROL SYSTEM

YU

SINCE 1978

YUTECH

**Servicing the Sugar
Industry since 1978**

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; sale@yutech.in W: www.yutech.in; www.yutechautomation.com

pH ANALYZER AND pH CONTROL SYSTEM
BASED ON YUTECH'S A15 INTELLIGENT ANALYZERS AND SYSTEMS PLATFORM

pH ANALYZER AND pH CONTROL SYSTEM
PRODUCT CODE:
ANALYZER MODEL: A15PHAACPETRC1D4R4FM,
ANALYZER AND CONTROLLER MODEL:
A15PHAACPETRC2D4R4FMC
ANALYZER AND CONTROLLER WITH ETHERNET MODEL:
A15PHAACPETRC2D4R4FMC
EM (Modbus TCPIP)

pH ANALYZER

pH ANALYZER AND CONTROL SYSTEM

➤ pH Analyzer and Electrode combination targets sensing of Hydrogen Ion Concentration (pH) which defines the Alkalinity or Acidity of Liquids or Syrups.

➤ YUTECH pH Analyzer works with any Combination Type pH Electrode and can accept RTD PT-100 Signal either from Separate Sensor or RTD embedded in pH Electrode.

➤ pH Analyzer plays a crucial role in Sugar Process Automation and helps in Stabilizing the overall Sugar Process as well as Sugar Colour and Quality.

➤ The YUTECH Intelligent Programmable pH Analyzer is a State-of-the-Art System having Built-in Fuzzy Logic for Accurately Sense, Analyze, Calculate and Derive Massecuite pH with Temperature Compensation. Furthermore, the Algorithm can also detect pH Electrode Decay and raise Alarm as well as notify the SCADA / PLC / DCS.

➤ Accurate pH reading ensures better Process Control and helps to maintain constant Massecuite / Melt / Molasses / Syrup pH thus results in Better Sugar Colour and Quality and Production Efficiency and Minimum Process Losses.

pH ANALYZER AND pH CONTROL SYSTEM
BASED ON YUTECH'S A15 INTELLIGENT ANALYZERS AND SYSTEMS PLATFORM
SALIENT FEATURES

- pH Sensor or Electrode Detects Hydrogen Ion Concentration as a function of emf. This Signal is then Processed in Analyzer to obtain pH Reading on a Scale of 0 – 14pH.

- YUTECH pH Analyzer is equipped with Intelligent Electrode Decay Calculation Algorithm which generates Alarm when Electrode Weakens and also generates Alarm when Change of Electrode is needed.

- Very Easy Calibration and Online Electrode Recalibration using Set-7 Function

- In-Built Automatic Temperature Compensation

- In-Built Self Cleaning and Washing of Electrode with pre-adjustable timing cycle

- 4-20 mA Output, Separate Modbus and Ethernet Communications

- On-line Calibration Software "YUTECH-AccessApp-pH" provides Remote Access to pH Analyzer for Calibration, Compensation and Trouble Shooting.

Innovative Features for Ease of Operation and to save on Installation Cost and Materials:

- **Built-in pH Equation**
- **Built-in Temperature Compensation**
- **Built-in PID Controller:**
  - Highly Accurate Fuzzy Logic PID Controller developed especially for Process Control and Flow Control Applications.
  - pH Control Logic built especially for Juice Liming Process
  - Remote Set Variable Facility

- **Built-in 3-Point Auto/Manual Station to Select Control Output from:**
  - Selector Switch for Local PID Output or DCS/PLC PID Output
  - Manual Output for Trouble Shooting

  This feature simplifies installation by eliminating need for installing a Junction Box and Extra wiring.

Innovative Features for Ease of Operation and to Save on Installation Cost and Materials:

- **Built-in Communication Links: See the Product Code to select the desired protocol**
  Ethernet:
  a. Modbus TCPIP Ethernet Communication Protocols
  b. External PID Controller Calibration Facility from DCS / PLC- SCADA / HMI System via Ethernet. Control Variables can be accessed and changed from DCS / PLC- SCADA / HMI.
  c. pH Data is Communicated for Data Acquisition and Data Storage within DCS / PLC- SCADA / HMI.

  RS485: Modbus RTU on request in Base Model.

  USB Communication Facility: For Calibration from PC or Android using System's USB Port. (This facility is available only in Controller with Ethernet Models).

  YUTECH Access App: Calibration Software can be installed in a PC or Android.

pH ANALYZER AND pH CONTROL SYSTEM
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SALIENT FEATURES

pH Electrode and Electrode Mounting, and Washing Assembly with Water Jacket Juice Cooler:

- YUTECH pH Analyzer works with any Combination Type pH Electrode
- pH Electrode is sheathed for protection.
- Wash Water Spray Tube of Stainless Steel construction is connected to a Solenoid Valve for Automatic Washing of Sensor Electrode.
- Periodic Cleaning by a signal from the Analyzer.
- Pneumatic Cylinder lifts the Electrode for cleaning.
- Juice Cooler uses Cold Water Jacket for cooling.
- Mounting, and Washing Assembly with Water Jacket Juice Cooler is Fabricated in MS or SS

TEMPERATURE SENSOR:
- RTD PT 100 Temperature Sensor with Thermowell constructed out of Solid SS Bar.

pH ANALYZER AND pH CONTROL SYSTEM
BASED ON YUTECH'S A15 INTELLIGENT ANALYZERS AND SYSTEMS PLATFORM
TECHNICAL SPECIFICATIONS

➢ **Power Supply:** 85 - 265 VAC, 50 – 60Hz
➢ **Analyzer Enclosure:** IP67 Field Mounted Dust and Moisture Proof
➢ **Input:**
  ➢ pH Electrode Signal
  ➢ RTD PT 100 Temperature Sensor Signal
  ➢ **Calibration:**
  ➢ From Keyboard
  ➢ USB Port for Windows / Android-based YUTECH-AccessApp-BA
➢ **Display:**
  ➢ **Base Model:** 4 Digit LED Dual Display
  ➢ **Controller and Controller with Ethernet Model:** 4 Digit LED Quad Display
  ➢ **Sensor Cleaning and Washing Output:** In-Built Potential Free Relay
➢ **Sensor Cleaning Timing Cycle:** Adjustable from Keyboard, default 15 Minutes
➢ **Signal Output:**
  ➢ 4 - 20 mA Temperature Compensated pH Output
  ➢ 4 - 20 mA PID Output (Controller and, Controller with Ethernet Models)
  ➢ 2 Potential-Free Relay Outputs
➢ **Communications:**
  ➢ Ethernet Communication Protocol: Modbus-TCPIP, in Controller with Ethernet Model
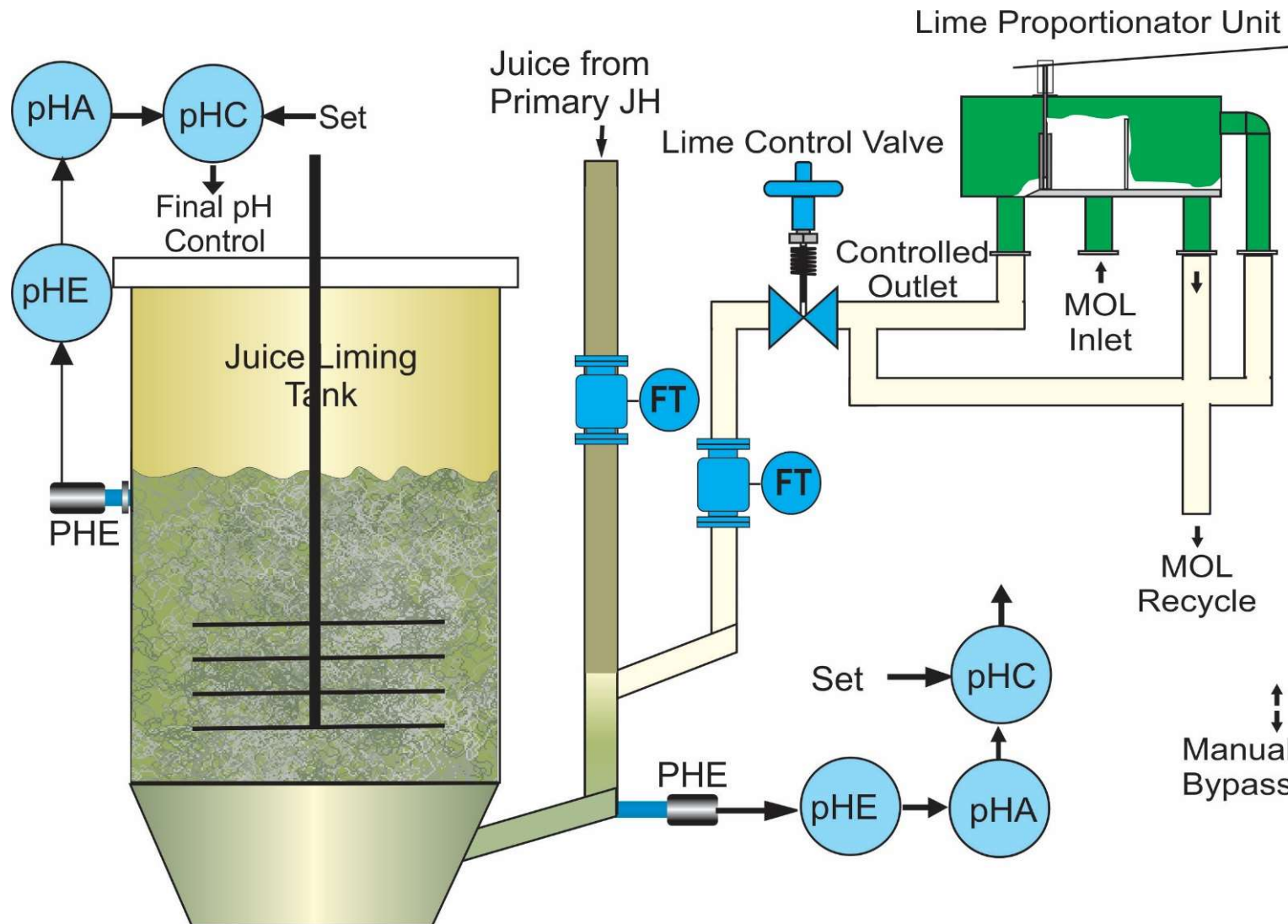 ➢ Modbus RTU, in Controller Model

Product Code:

- A15PHAACPETRC1D4R4FM – A15FCA means Fluid Consistency Analyzer of A15 Product Family
- A15PHAACPETRC1D4R4FM – AC Power Supply
- A15PHAACPETRC1D4R4FM – Analog Inputs and Outputs
    - AI (PETR): pH Electrode and RTD PT100; AO (C1): 1 Ch. 4-20mA (pH)
    - AI (PETR): pH Electrode and RTD PT100; AO (C2): 2 Ch. 4-20mA (Ch. 1: pH and Ch. 2: PID)
- A15FCAACSCTRC1D4R4FM: Digital Inputs and Outputs
    - DI (D4): 4 DIs (24VDC); DO (R4): 4 Relay Outputs (24VDC, 1A)
- A15PHAACPETRC1D4R4FM – Field Mounted Enclosure
- A15PHAACPETRC1D4R4FMC – Analyzer with Controller Model
- A15PHAACPETRC1D4R4FMCEM – Analyzer with Controller and Ethernet Model, EM: Modbus TCP/IP Communication (Ethernet)

- **Range:**
    - Measurement Range 0 – 14 pH
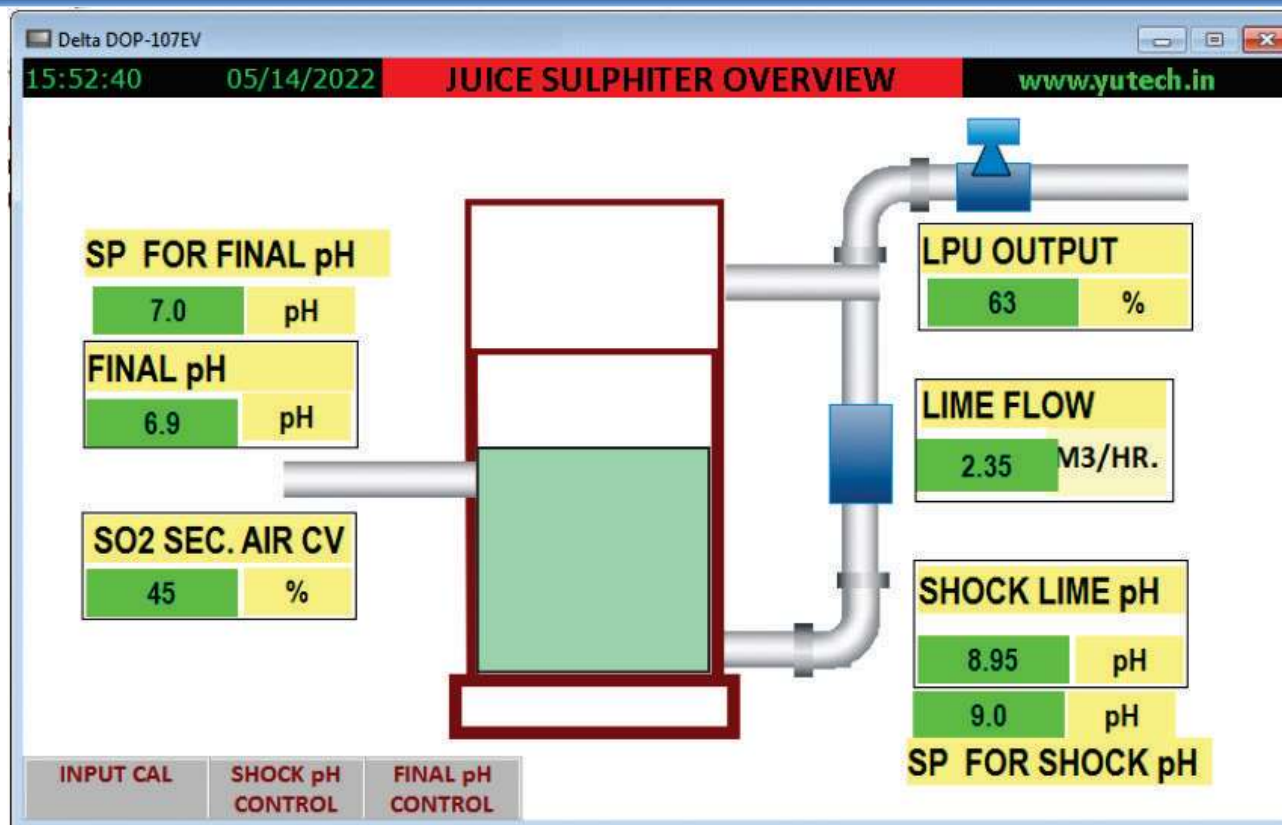   - Temperature Compensated Measurement Range 2 – 12 pH

JUICE LIMING AND FINAL JUICE pH CONTROL SYSTEM

SCHEMATIC DIAGRAM

JUICE LIMING AND FINAL JUICE pH CONTROL SYSTEM

SCREENSHOT

JUICE LIMING AND SULPHITOR AUTOMATION:
- Shock Limed Juice pH Sensing
- Shock Limed Juice Temperature Sensing
- Final Juice pH Sensing
- Final Juice Temperature Sensing
- Lime Proportionator Control with respect to Temperature Compensated Shock Limed Juice pH
- Secondary Air or Molten Sulphur Pump VFD Control with respect to Temperature Compensated Final Juice pH

YUTECH undertakes Turnkey Automation Projects:

DCS or PLC Based Turnkey Automations or Standalone Control Systems:

➢ Complete Sugar Mill Automation with all Loops like Cane Feeding, Mill Speed Controls, Imbibition and Juice Flow Controls etc

➢ Complete Sugar Process Automation with Loops like Evaporator, Pans, Continuous Pans, Melters Conditioners, Direct Contact Heaters, Condensers etc

➢ Complete Sugar Refinery / Pharma Grade Sugar Plant Automation with Loops like Pans, Continuous Pans, Melters, Melt Clarifier, Melt Filtration Systems, Direct Contact Heaters, Condensers etc

➢ Complete Boiler and Power Plant Automation

➢ Complete Sugar Plant Automation and Instrumentation

➢ Complete Distillery Automation and Instrumentation

➢ Complete Process Plant (Pharma / Food Processing / Cement / Steel) Automation and Instrumentation

➢ VCP / CVP / Batch Pan Automation

➢ Condenser Automation

➢ Continuous Centrifugal Machine Automation based on CSD or Iris Valve

➢ Evaporator and FFE Automation

➢ Direct Contact Heater Automation

➢ Vertical Crystallizer

➢ pH Control System

YUTECH BRIX ANALYZER AND AUTO CLEANING SELF RETRACTABLE BRIX SENSOR
BASED ON YUTECH'S A15 INTELLIGENT ANALYZERS AND SYSTEMS PLATFORM

YU SINCE 1978

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BRIX ANALYZER
PRODUCT CODE:
BASE MODELS: A15BAACBSRC1D4R2FM,
CONTROLLER MODEL: A15BAACBSRC2D4R4FMC
CONTROLLER WITH ETHERNET MODEL:
A15BAACBSRC2D4R4FMCEM (Modbus TCPIP)

AUTO-CLEANING SELF-RETRACTABLE BRIX SENSOR
PRODUCT CODE:
ASDBSRSCW1EV03

OTHER YUTECH ANALYZER PRODUCTS

A15BAACBSRC1D4R2FM1

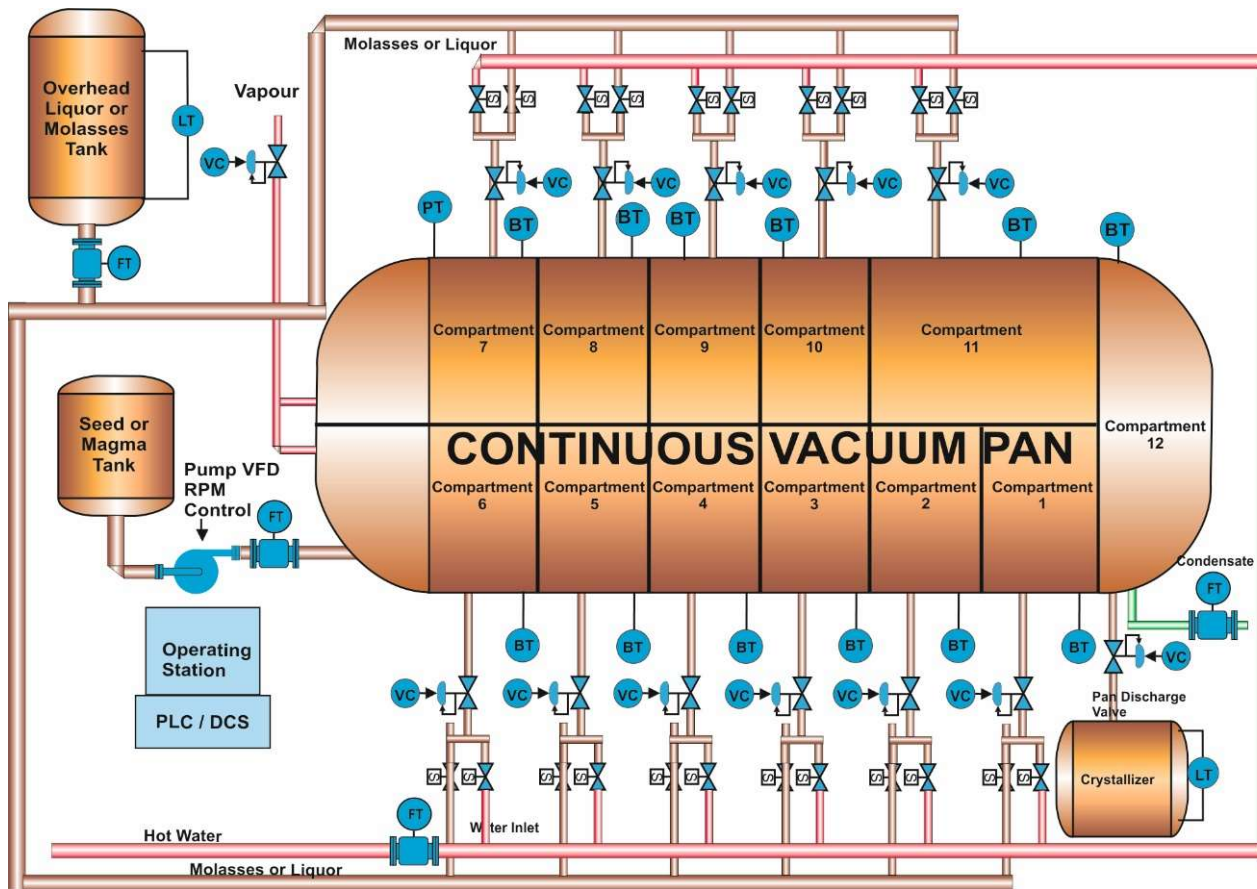A15BAACBSRC2D4R2FM1EM

ELECTRODE IN SENSING POSITION

ELECTRODE IN CLEANING POSITION

YUTECH CONTINUOUS VACUUM PAN AUTOMATION USING FLUID CONSISTENCY-BRIX ANALYZER OR BRIX ANALYZER

VERTICAL CONTINUOUS PAN AUTOMATION:

- **YUTECH CONSISTENCY-BRIX OR YUTECH BRIX SENSING AND MOLASSES / WATER INTAKE CONTROL FOR EACH COMPARTMENT**
- **VFD SPEED CONTROL AS PER PAN CHAMBER LEVEL FOR LAST CHAMBER IF INSTALLED**
- **TEMPERATURE SENSING THROUGHOUT THE PAN CHAMBERTO ENSURE UNIFORM TEMPERATURE INSIDE PAN CHAMBER BODY**
- **SEED FLOW CONTROL MAINTAINING MOLASSES TO SEED RATIO**
- **CALENDRIA VAPOUR PRESSURE CONTROL**
- **STANDALONE SYSTEM FOR PAN CHAMBER AND COMMUNICATION WITH MAIN VCP PLC / DCS SYSTEM**

YUTECH FLUID CONSISTENCY-BRIX ANALYZER AND CONTROL SYSTEM
BASED ON YUTECH'S A15 INTELLIGENT ANALYZERS AND SYSTEMS PLATFORM

FLUID CONSISTENCY-BRIX ANALYZER AND CONTROL SYSTEM
PRODUCT CODE:
ANALYZER MODEL: A15FCAACSCTRC1D4R4FM,
ANALYZER AND CONTROLLER MODEL: A15FCAACSCTRC2D4R4FMC
ANALYZER AND CONTROLLER WITH ETHERNET MODEL:
A15FCAACSCTRC2D4R4FMCEM (Modbus TCPIP)

MOTORIZED FLUID CONSISTENCY SENSOR
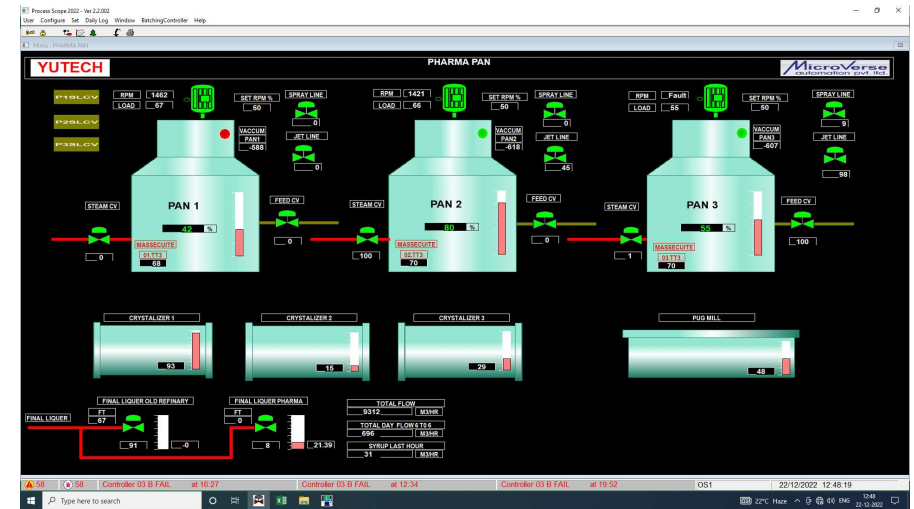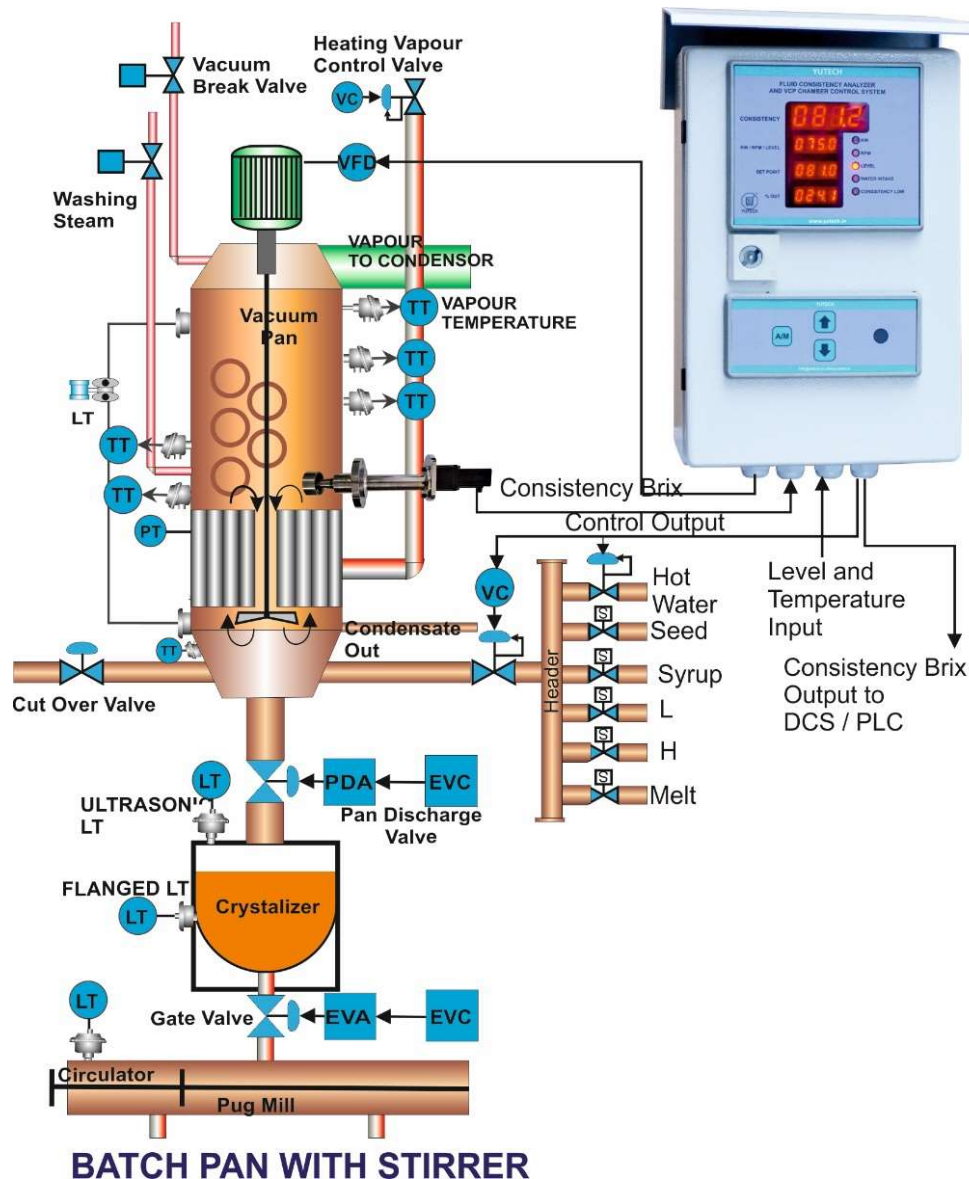PRODUCT CODE: ASDMSFCSV01

OTHER YUTECH ANALYZER PRODUCTS

FLUID CONSISTENCY-BRIX ANALYZER AND CONTROL SYSTEM

MOTORIZED FLUID CONSISTENCY SENSOR

YUTECH FLUID CONSISTENCY BRIX-ANALYZER AND CONTROL SYSTEM

SCHEMATIC DIAGRAM: BATCH PAN AUTOMATION USING FLUID CONSISTENCY ANALYZER

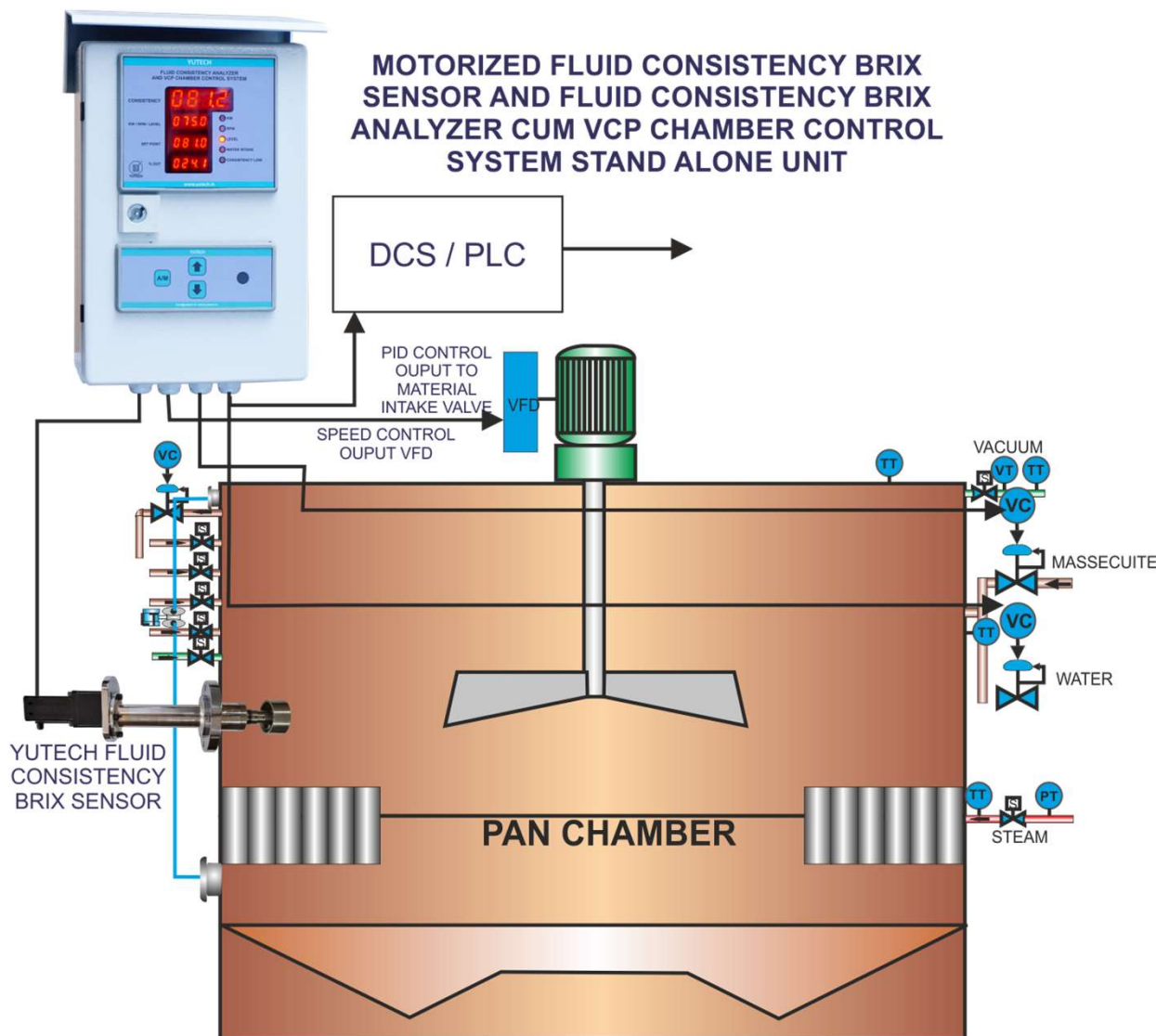### BATCH PAN WITH MECHANICAL CIRCULATOR / STIRRER

BATCH PAN WITH STIRRER

SCREEN SHOT: BATCH PAN AUTOMATION

BATCH PAN AUTOMATION:

- **CONSISTENCY-BRIX SENSING AND MATERIAL / WATER INTAKE CONTROL**
- **VARIABLE BRIX SET-POINT AS PER PAN LEVEL**
- **VFD SPEED CONTROL AS PER PAN LEVEL**
- **TEMPERATURE SENSING THROUGHOUT THE PAN TO ENSURE UNIFORM TEMPERATURE INSIDE PAN BODY**
- **BATCH COMPLETE INDICATION AND DROP SUGGESTION**
- **STANDALONE SYSTEM OR PLC / DCS BASED SYSTEM**

YUTECH FLUID CONSISTENCY-BRIX ANALYZER AND CONTROL SYSTEM

VERTICAL CONTINUOUS PAN AUTOMATION USING FLUID CONSISTENCY-BRIX ANALYZER

MOTORIZED FLUID CONSISTENCY BRIX SENSOR AND FLUID CONSISTENCY BRIX ANALYZER CUM VCP CHAMBER CONTROL SYSTEM STAND ALONE UNIT

DCS / PLC

PID CONTROL OUPUT TO MATERIAL INTAKE VALVE

SPEED CONTROL OUPUT VFD

VFD

VACUUM

MASSECUITE

WATER

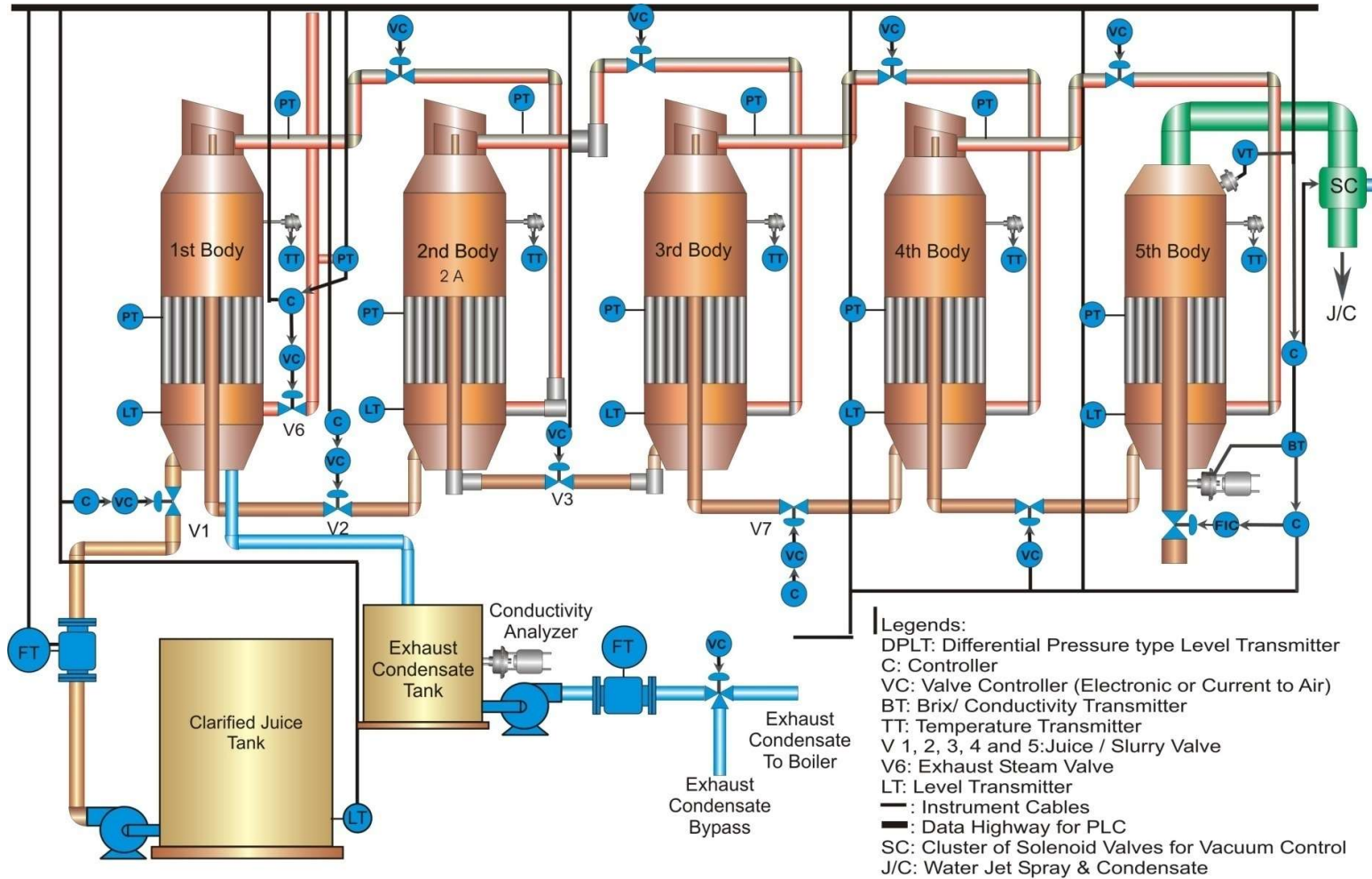YUTECH FLUID CONSISTENCY BRIX SENSOR

PAN CHAMBER

STEAM

VERTICAL CONTINUOUS PAN AUTOMATION:

- **CONSISTENCY-BRIX SENSING AND MATERIAL / WATER INTAKE CONTROL**
- **VFD SPEED CONTROL AS PER PAN CHAMBER LEVEL**
- **TEMPERATURE SENSING THROUGHOUT THE PAN CHAMBERTO ENSURE UNIFORM TEMPERATURE INSIDE PAN CHAMBER BODY**
- **SEMI-AUTOMIC DROP CONTROL IN ABNORMAL CONDITIONS**
- **STANDALONE SYSTEM FOR PAN CHAMBER AND COMMUNICATION WITH MAIN VCP PLC / DCS SYSTEM**

YUTECH EVAPORATOR / FFE AUTOMATION USING FLUID CONSISTENCY-BRIX ANALYZER

Evaporator Control System

Legends:
DPLT: Differential Pressure type Level Transmitter
C: Controller
VC: Valve Controller (Electronic or Current to Air)
BT: Brix/ Conductivity Transmitter
TT: Temperature Transmitter
V 1, 2, 3, 4 and 5: Juice / Slurry Valve
V6: Exhaust Steam Valve
LT: Level Transmitter
▬▬ : Instrument Cables
▬▬ : Data Highway for PLC
SC: Cluster of Solenoid Valves for Vacuum Control
J/C: Water Jet Spray & Condensate

EVPORATOR AUTOMATION:

- **CONSISTENCY-BRIX, LEVEL AND TEMPERATURE SENSING OF EACH BODY**
- **HEATING STEAM / VAPOUR TEMPERATURE AND PRESSURE SENSING**
- **LEVEL AND BRIX MAINTAINED IN EACH BODY**
- **EXHAUST CONDENSATE CONDUCTIVITY SENSING AND BYPASS**
- **INTELLIGENT DATA ANALYSIS WITH MAINTENANCE AND CLEANING ALARMING SYSTEM**
- **PRECEDING BODY LEVEL SYNCHRONIZATION FOR ALL BODIES INCLUDING JUICE TANKS AND CANE CARRIERS**
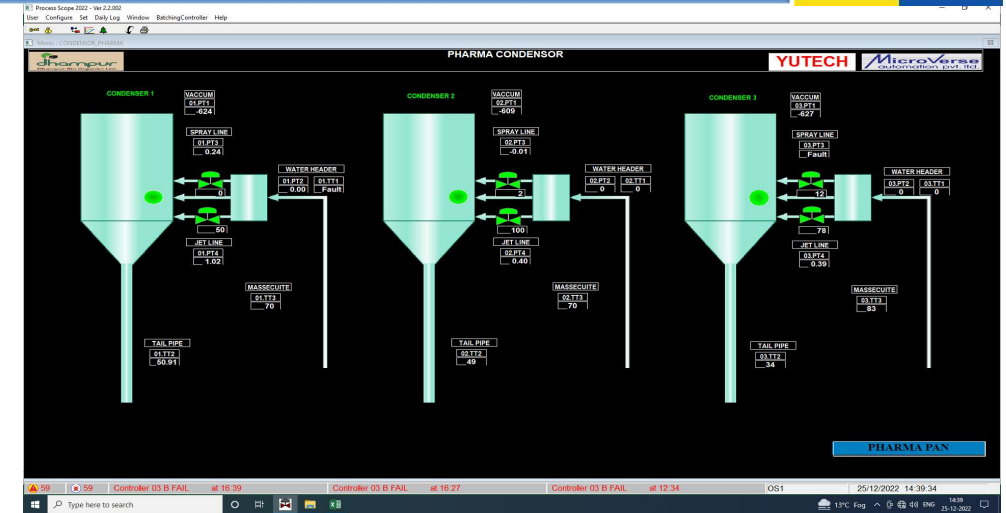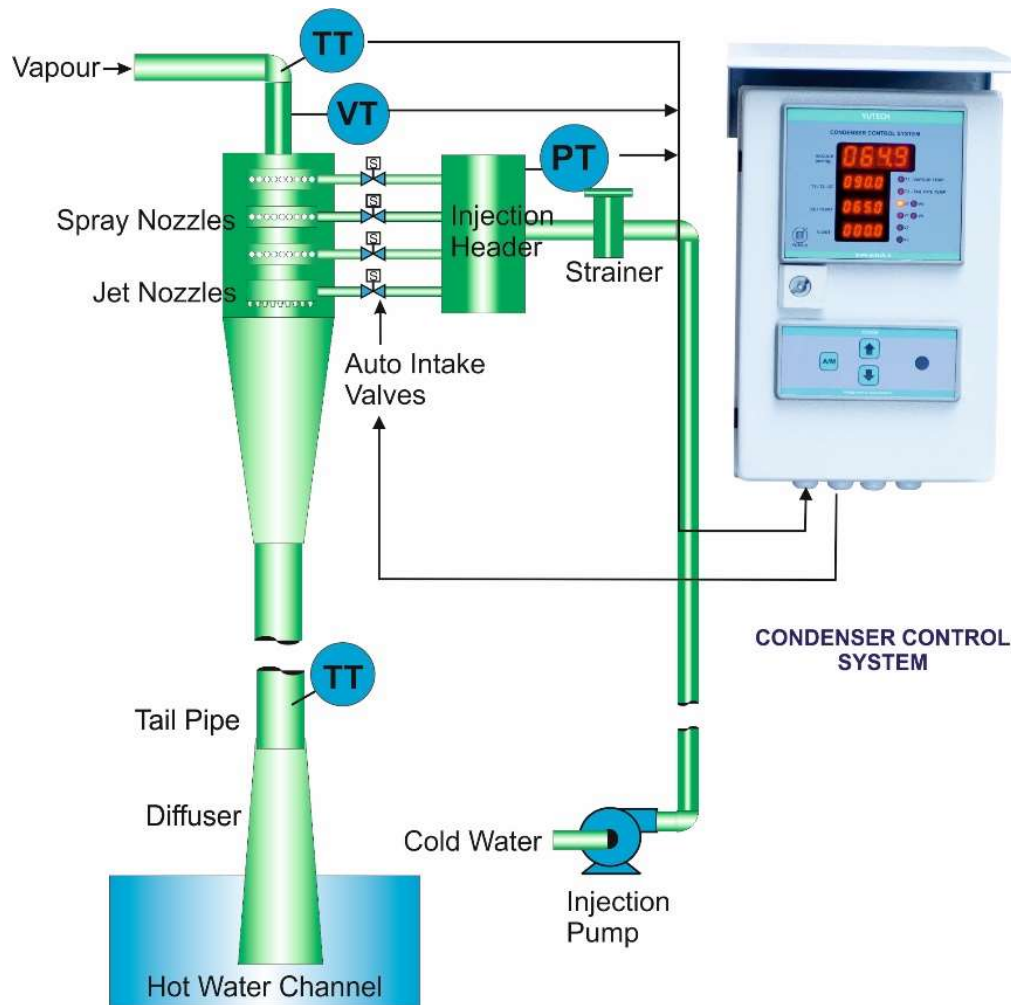
YUTECH CONDENSER CONTROL SYSTEM FOR PANS AND EVAPORATORS

SCHEMATIC DIAGRAM: CONDENSER AUTOMATION USING YUTECH CONDENSER CONTROLLER
SCREEN SHOT: CONDENSER CONTROL SYSTEM IMPLEMENTED USING DCS / PLC

SCHEMATIC DIAGRAM AND SCREENSHOT: CONDENSER CONTROL

CONDENSER AUTOMATION:

➢ Separate Water Entry for Different Sets of Spray Nozzles and Spray Jet and Water Quantity is Automatically Controlled by ON/OFF Valve for Respective Nozzle Set Valve wrt Vacuum and Temperature difference between the Vapour and Condensate Tail Pipe

➢ Number of Jets & Nozzles and Jet & Nozzle Diameters designed as per Condenser Capacity

➢ Complete Stainless-Steel Construction, Strainer provided for each Condenser Header

➢ Water Pressure in the Common Injection Header maintained by Controlling Injection Pump VFD

➢ Jet Compartment Controlled by Separate Valve

➢ Vapour and Tail Pipe Temperature Measured

YUTECH'S POWERFUL AND RUGGED A12 PLATFORM BASED INSTRUMENTS:

VERY POWERFUL, A12 PLATFORM HAS DECENT ANALYTICAL ABILITY WITH HIGH-SPEED ETHERNET AND WIRELESS COMMUNICATION PROTOCOLS AND RUGGED FIELD MOUTED ENCLOSURES

YUTECH

Instruments Specifically Designed and Manufactured for Sugar Mills having IP 67 protection class Enclosures:

➢ Cane Blanket Level Indicators & Transmitters with Sensor Options of:
- ➢ Hall's Effect Type Sensors
- ➢ Ultrasonic Type Sensors

➢ Mill Top Roller Lift Indicators & Transmitters with Sensor Options of:
- ➢ Hall's Effect Type Sensors
- ➢ Ultrasonic Type Sensors

Field Mounted Instruments having IP67 protection class Enclosures for any Process Applications:

➢ Field Mounted Universal Input Process Indicator & Transmitter with Ethernet / Wireless Communication Facility and 4-20mA Retransmission and 2 Potential-Free Relay Outputs

➢ Field Mounted Dual Channel Universal Input Process Indicator & Transmitter with Ethernet / Wireless Communication Facility and with two 4-20mA Retransmission and two Potential-Free Relay Outputs

➢ Field Mounted PID Controller and Time Proportionate PID Controller

➢ Field Mounted Customized Pre-fed Logic Indicators and Controllers

➢ Function Display

➢ Electro-Pneumatic Valve Positioner with Position Feedback

➢ Field Mounted Auto / Manual Stations with External Pot Facility

➢ Field Mounted Flow Totalizer

YUTECH'S A10 PLATFORM BASED INSTRUMENTS:

A10 PLATFORM IS DESIGNED FOR PROCESS INSTRUMENTS, INDICATORS, SCANNERS AND CONTROLLERS WITH HIGH-SPEED COMMUNICATION FACILITY AND PROTOCOL CONVERTERS

GENERAL INSTRUMENTS FOR ANY PROCESS APPLICATIONS:

➢ Universal Input Process Indicator & Transmitter
➢ Dual Channel Universal Input Process Indicator & Transmitter
➢ PID Controller
➢ Time Proportionate PID Controller
➢ Universal Input Jumbo Displays of Digit Sizes from 1" to 12"
➢ Universal Input Jumbo Displays of Digit Sizes from 1" to 12" with 4-20mA Retransmission and 2 Potential-Free Relay Outputs
➢ Modbus RTU Input Jumbo Displays of Digit Sizes from 1" to 12"
➢ Special Machine Controllers customized for YUTECH Machines
➢ Auto / Manual Stations with External Pot Facility
➢ 8 AND 16 Channel Scanner

I/O AND PROTOCOL CONVERTER PRODUCTS:

➢ Universal Input Process Indicator with Modbus RTU, 4-20mA Retransmission and 2 Potential-Free Relay Outputs
➢ 8 Channel Universal Input Card with Modbus RTU Communication
➢ 8 Channel Universal Input Card with Wireless Communication
➢ Wireless to Ethernet Protocol Converter
➢ Modbus RTU to Modbus TCP/IP Serial to Ethernet Protocol Converter
➢ EtherNetIP TO Modbus TCP/IP Protocol Converter
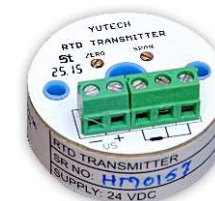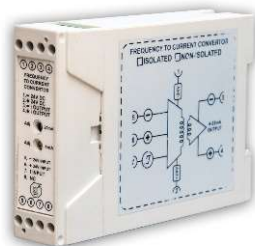
YUTECH's A09 Platform based General Industrial Instruments:

- ➤ Head Mounted RTD Transmitters for Bearing Temperature Sensing
- ➤ Thermo-couple Temperature Transmitters - Panel Mounted / Field Mounted
- ➤ RTD Temperature Transmitters - Head Mounted / Panel Mounted / Field Mounted
- ➤ RPM Transmitters for All Types of Drives
- ➤ Current Transmitters for Electric Motor Drive Load Sensing
- ➤ Vacuum Transmitters
- ➤ Draft Range Negative & Positive Composite Range Pressure Transmitters
- ➤ General Process Indicators
- ➤ General Field Mounted Process Indicators

YUTECH'S INTELLIGENT A15 PLATFORM BASED ANALYZERS AND SYSTEMS:

INTELLIGENT & VERY POWERFUL, A15 PLATFORM HAS ANALYTICAL AND HIGHER I/O HANDLING ABILITY WITH COMMUNICATION FACILITY FOR ETHERNET AND WIRELESS PROTOCOLS

FIELD MOUNTED ANALYZERS AND CONTROL SYSTEMS FOR PROCESS, PHARMA, DAIRY AND SUGAR INDUSTRY:

SUGAR PROCESS ANALYZERS AND CONTROLS:
- HIGH FREQUENCY BRIX ANALYZER AND BRIX ANALYZER AND AUTO-RETRACTABLE SELF-CLEANING BRIX SENSOR
- FLUID-DENSITY-BRIX ANALYZER CUM CONTROL SYSTEM AND MOTORIZED FLUID DENSITY SENSOR
- CONDUCTIVITY ANALYZER
- PH ANALYZER
- CONTINUOUS CENTRIFUGAL MACHINE AUTOMATION SYSTEM USING CONCENTRIC SPLIT DIAPHRAGM CONTROL VALVE ALSO CALLED IRIS VALVE.
- **CONDENSER CONTROL SYSTEM:** MULTIPLE OR SINGLE WATER SPRAY AND JET ENTRY CONDENSER CONTROLS.

SUGAR MILL AND BOILER ANALYZERS AND CONTROLS:
- **INFRA RED TYPE LEVEL SENSING AND TRANSMISSION SYSTEM:** SUGAR MILL DONNELLY CHUTES.
- **INFRA RED TYPE LEVEL SENSING AND TRANSMISSION SYSTEM:** BOILER BAGASSE SILOS OR CHUTES.
- **CAPACITIVE TYPE LEVEL SENSING AND TRANSMISSION SYSTEM:** SUGAR MILL DONNELLY CHUTES.

DATA ACQUISITION AND COMMUNICATION:
- **FIELD MOUNTED DATA ACQUISITION AND COMMUNICATION SYSTEM:** ETHERNET / WIRELESS COMMUNICATION
- **IOT FIELD MOUNTED DATA ACQUISITION AND COMMUNICATION SYSTEM:** PROCESS DATA TRANSMISSION AND INTERNET COMMUNICATION ON GSM AND WIFI
- 16 CHANNEL SCANNER WITH MODBUS RTU
- 16 CHANNEL SCANNER WITH MODBUS TCPIP

YUTECH SUGAR MILL PROCESS INSTRUMENTS
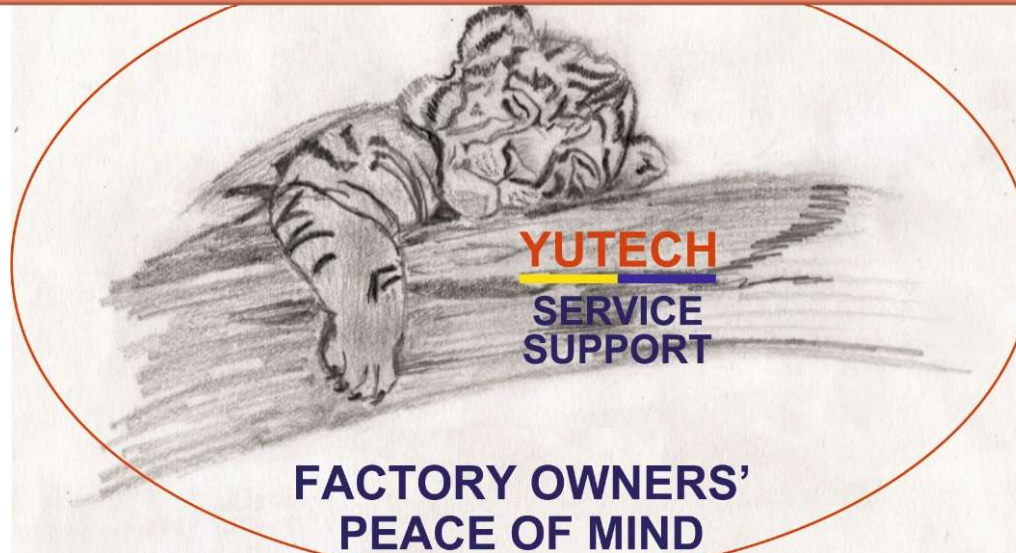
MEASURING SUGARS BRIX BY BRIX

YUTECH FLOW CONTROLS

CONTROL SAVE EARN

YUTECH AUTOMATION

THE SWEETENER TO SUCCESS

YUTECH INSTRUMENTS

ANALYZE TRANSMIT CONTROL COMMUNICATE

YUTECH

SINCE 1978

YUTECH

SERVICE
SUPPORT

**FACTORY OWNERS'
PEACE OF MIND**

**SAVE FUEL, REDUCE CARBON FOOTPRINT,
MAKE THE WORLD GREENER
AND YET, MAKE MONEY
THANK YOU**