Advance Process Control Platform with PLC

Nvis 3002AP

Nvis 3002AP Advance Process Control is a complete setup to control process through two point (ON/OFF) and three point (PID) controller. It has two processes-Temperature and Liquid level which we can control through an PLC which has 4 ADC and 20 digital input/output. Nvis 3002AP also gives the exposure to Industrial components like PLC, Level Transmitter, Temperature Transmitter, Valves, PID controller and Sensors. Users can learn how to calibrate, install, operate, programming and tune the instruments for controlling the process. All electrical components are connected to the control panel to allow students to measure signals and connect the devices in wide variety of control configuration including open loop (manual control) and close loop (PID control, ON/OFF control).

Nvis 3002AP is a good platform to learn the ladder programming of the real industrial processes, from simple switch control to PID control programming in PLC. This helps in exploring the complex instructions used in Ladder programming for controlling digital and analog input and output.

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Features

- **Use of Industrial Process Control elements**
- **Heavy duty bench Workstation**
- **Electrical Control Panel**
- **Capacitive Level Sensor**
- **Temperature Transmitter**
- **Din rail mounting for PLC**
- **Process Control concept**
- **RTD Sensor**
- **Thermocouple Sensor**
- **Start , Stop , Emergency Stop button , Indicators for Pump , Heater , Stirrer, Solenoid Valve, Audio Indicator, Visual Indicator**
- **2 Types of Controller : PID Control & PLC Control**
- **Process Loop Tuning & Stable Process**
- **Real-time PLC interface with ADC & Digital input/output**
- **Process Control by ON/OFF Controller**
- **Process Control by PID with Auto tuning**
- **Process Control loops**
- **User Friendly, Self Explanatory Systems**
- **Temperature Measurement and Control**
- **Automatic and Manual Control**
- **PC based Ladder programming**
- **Several sample Ladder programs**
- **Practice Troubleshooting skills**
- **Leak proof Safety measures and sturdy piping.**
- **Enhanced Electrical Safety considerations**
- **Heat Transfer concepts**
- **Transducer/Transmitter Calibration**
- **Piping and instrumentation diagram**
- **Built-In Instrumentation**
- **Sump tank for inlet and outlet of water**
- **Robust construction**
- **Product Tutorial**

Scope of Learning

Study and use of

- RTD characteristics.
- Thermocouple characteristic
- Temperature Transmitter characteristics
- Level Transmitter characteristics
- Study of Industrial PID Controller as on/off Controller
- Study of Industrial PID Controller as P, PI and PID Controller
- Study of auto tuning mode of Industrial PID Controller
- Ladder programming
- Normally Open & Normally Close contact
- Logic Gates
- Memory Bit
- Set and reset bit
- Timer instruction
- Special Memory bit
- Counter instruction
- Compare instruction
- Math instruction
- PWM instruction
- MOV Instruction
- Jump & Label instruction
- Subroutine
- Analog Input
- Analog Output
- Nvis3002A in manual mode using PLC
- PID instruction using PLC for Temperature
- PID instruction using PLC for Level
- Thermal Process

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Technical Specifications

Push to ON Switch:	**: 6**
Toggle Switch	**: 5**
Indicator Lamp	**: 5**
Emergency Stop Switch	**: 1**
Audio Indicator	**: 1**
Process (Measuring) Tank	**: 1**
Capacity	: 15 Litres
Material	: Stainless Steel (SS304)
Dimension	: 300 X 315 X 250 mm
Supply (Sump) Tank	**: 1**
Capacity	: 30 Litres
Material	: Stainless Steel (SS304)
Dimension	: 500 X 315 X 250 mm
Temperature Sensor	**: 1**
Type	: RTD (PT100)
Wire	: 3 Wire
Rod Length	: 9"
Temperature Range	: (-99 to 850°C)
Thermocouple Sensor:	**1**
Type	: K Type
Wire	: 2 Wire
Rod Length	: 9"
Temperature Range	: (-200 to1250°C)
Heater	**: 1**
Supply	: 230 V AC (1000Watt)
Ammeter	**: 1**
Range	: 0 to 5A, 0.2% resolution
Solenoid Valve	**: 1**
Supply Voltage	: +230V AC
Type	: 2/2
Port size	: 1/2"
Pressure range	: 0-10kg/cm^2
Stirrer	**: 1**
Supply	: 12 V DC
Level Transmitter	**: 1**
Supply Voltage	: +24V DC
Output Voltage	: 4mA to 20mA
Cable Entry	: 2 X 1/2" BSP, SC gland brass
User Interface	: 4 digit display + 4 Keys
Read out	: 0-100%, 4-20mA LED (red), Digital, 2-1/2
Outputs	: 4-20 mA PNP output (3 wire) or Galvanically isolated (4 wire loop) (User selectable) 4 - 20 mA output is over current safe and compatible with PLC Measurement range : 10-50000 pF. : Calibration: Calibratable over measurement range. : Calibration method : Easy (Using DIP Switches)
Sensing rod material	: Stainless Steel (SS304)
Insulation	: Full PTFE
Mains	: +24V DC @25mA (reverse polarity safe)
Probe Length	: 250mm
Temperature Transmitter	**: 1**
Input RTD	: Pt100 3 wire
Output	: 4 - 20 mA, two wire
Accuracy	: ±0.1% of the calibrated span
Loop Supply	: 24V DC nominal (12 to 36)V DC
Electrical Control panel	**:** MS Powder coated panel with Switches, indicator, Test Points, PID and DAQ , Ammeter on front facia, DAQ mounted on DIN rail channel, multistrand wire with proper insulated, lugs, ferruling & neat wire dressing & clamping
Industrial PID Controller	**: 1**
Input	: RTD (PT100), K type Thermocouple
Display	: 7 segment LED, dual display
Control Action	: PID & ON/OFF
Supply Voltage	: 230V AC
Relay Action	: Forward for cooling and reverse for heating
Water Pump	**: 1**
Flow Rate	: 3800L/h
Operating Voltage	: 165 -230 V AC
Piping	**:** 1/2" PVC
Drain valve	**: 1**
Size	: ½"
Computer Interface	**:** USB
Caster Wheel	: 4 nos.
Dimension	: W 3850 x D 1400 X H 1400
Weight	: 75 Kgs (Approximately).
Power Supply	: 230V ± 10%, 50 / 60 Hz
Programmable Logic Controller (PLC)	
Digital Input	: 12
Digital output	: 8
Program size(Words)	: 4096
Expansion module	: Expandable
Interfacing	: USB
No. of ports	: 1
Input voltage	: 24 V DC
Output voltage	: 5 V DC
Power Supply	: 100V - 240V AC, 50/60Hz

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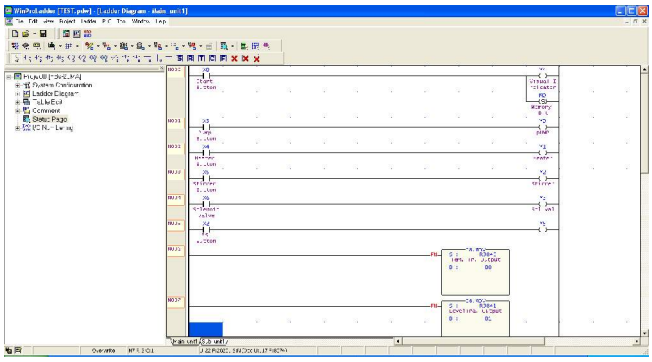
Analog Output :

Total Channels	:	2 CH
Resolution	:	14 bit
Signal Resolution	:	0.3mV (Voltage), 0.61uA (Current)
I/O Points Occupied	:	2 RO (Output Register)
Conversion Time	:	Updated each scan
Accuracy	:	±1 %
Max. and Min. Output	:	Voltage Output- 500~1MΩ Loading Current Output- 0~500W
Output Range	:	Voltage: +10V, +5V, 0~10V, 0~5V,
Current	:	+20mA, +10mA, 0~20mA,0~10mA

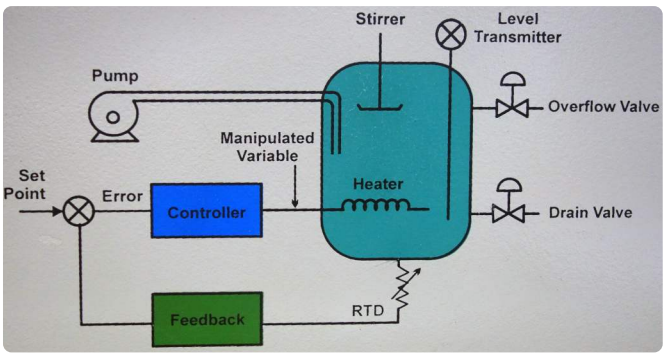
Included Accessories :

Mains Cord	:	1
PLC Communication Cable	:	1
Panel Gate Key	:	1
Drawer Lock Key	:	1
Flexible Pipe	:	1 meter
Product Tutorial	:	Online

Software window



Flow diagram



Control Panel

Subject to Change.

An ISO 9001: 2008 company
Designed & Manufactured in India by :

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