



**Sciencetech 2470 Electro Pneumatic WorkStation** is designed to demonstrate the design, construction and application of Pneumatic components and circuits. It integrates PLC technology to build Hybrid Industrial Automation systems with Pneumatic components and modules.

Pneumatic technology is found in numerous areas of engineering. Students investigate the basic “building blocks” of modern Pneumatics and how they are interconnected to form systems. Pneumatic systems provide the power needed to control aircrafts, operate heavy dump trucks, excavators, operate the brakes in our cars and even power lifts in tall buildings.

PLC provides flexibility to design and build numerous systems using software and I/O interfaces without changing hard wired connections.

## Features

- PLC operated Electro Pneumatic platform
- 12 Digital Inputs, 8 Digital Outputs
- Toggle switches, Push to on Switch, double acting cylinder, Single Acting cylinder, solenoid valve, flow control valve, manifold, hand lever valve, limit switch, proximity sensor, palm actuator, OR valve, roller lever valve, FRL, pressure gauge, single acting cylinder, air compressor, Audio and visual indicator
- Industrial look & feel
- Function and identification of Pneumatic components and their symbols
- Powerful instruction sets
- Extremely easy and student friendly software
- Several sample Ladder programs
- Practice troubleshooting skills
- WorkStation has 4 wheels, for suitable movement and installation
- Storage drawers with locking facility, Place in drawers for patch cords, and other accessories for storage, and easy identification.
- MCB for ON/OFF control and over load protection
- Sequential & Linear Pneumatic control
- Understanding of Industrial Pneumatic Components
- Pneumatic safety awareness
- Robust construction
- 4 mm patch cord connections
- Mounting panel for Pneumatic Components
- Online product tutorials

## Scope of Learning

### Study and use of :

- Normally Open (NO) and Normally Closed (NC) contact using PLC
- Types of logic gate: NOT, AND, OR, NAND, NOR, XOR & XNOR gate using PLC
- Set and Reset bit using PLC
- Memory bit using PLC
- Timer instruction using PLC
- Counter instruction using PLC
- Compare instruction using PLC
- Arithmetic (addition) instruction using PLC
- Move instruction using PLC

### Control of:

- Double Acting Cylinder (DAC) using 5/2 Solenoid Valve using PLC
- Double Acting Cylinder (DAC) by using 5/2- Hand lever valve
- Single Acting Cylinder using 3/2 Roller Lever Actuator
- Double Acting Cylinder (DAC) using two flow control valve
- Single Acting Cylinder using 3/2 Solenoid Valve using PLC
- Single Acting Cylinder using Palm Actuator (3/2 Pushbutton Valve)
- Double Acting Cylinder (DAC) using Shuttle Valve using PLC

### Sequencing of:

- (A+A-) control of Double Acting Cylinder by 5/2 Solenoid Valve using PLC
- (A+B+A-B-) control of two Double Acting Cylinder (DAC) by using PLC
- (A+B-A-B+) control of two Double Acting Cylinder (DAC) by using PLC
- (A-B+A-B-) control of two Double Acting Cylinder (DAC) by using PLC
- (A-B-A+B+) control of two Double Acting Cylinder (DAC) by using PLC

### Counting of:

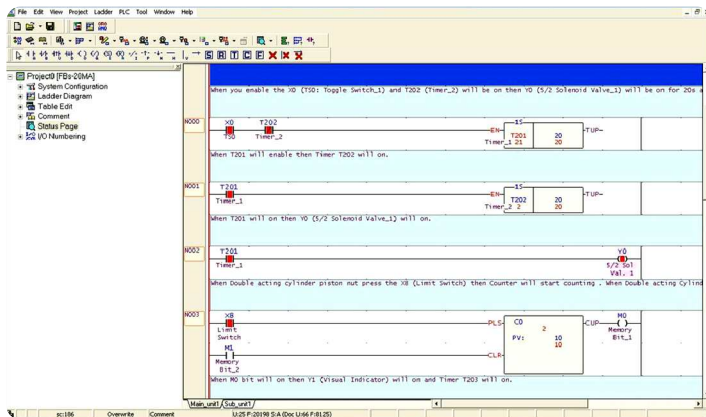
- Double Acting Cylinder\_2 (DAC2) Piston forward movement using proximity sensor using PLC
- Double Acting Cylinder (DAC) forward movement using limit switch using PLC

### Technical Specifications

#### Programmable Logic Controller

Digital Inputs	: 12 nos.
Digital Outputs	: 8 nos.
Program size (words)	: 4096
Boolean execution speed	: 0.33 $\mu$ s/Sequential instruction in average
Interfacing	: USB
Input & Output Voltage	: 24 V DC
Power Supply	: 110V - 260V AC, 50/60Hz
Toggle Switches	: 5 nos.
Supply	: 24V DC
Push to On Switch	: 4 nos.
Supply	: 24V DC
Visual Indicators	: 8 nos.
Supply	: 24V DC
Audio Indicator	: 1 no.

#### Software Window



#### Pneumatics Components

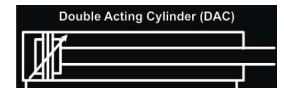
Double Acting Cylinder	: 2 nos.
Single Acting Cylinder	: 1 no.
5/2 Hand lever Valve	: 1 no.
Manifold	: 1 no.
Flow control Valves	: 2 nos.
5/2 Solenoid Valves	: 2 nos.
3/2 Solenoid Valve	: 1 no.
3/2 Push Button (Palm Actuator)	: 1 no.
Shuttle Valve (OR Valve)	: 1 no.
Roller lever Valve	: 1 no.
Proximity Sensor	: 1 no.
Limit Switch	: 1 no.
Pressure Gauge	: 1 no.
Air Compressor	: 1 no.

#### Pneumatics Components description

##### Double Acting Cylinder



Physical view



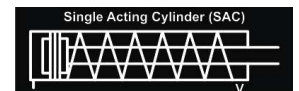
Symbol

Stroke Length	: 100mm
Operating Pressure	: 7 -120 Psi
Diameter	: 32mm

##### Single Acting Cylinder



Physical view



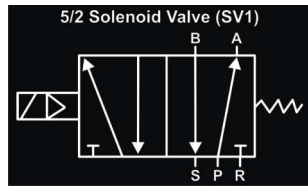
Symbol

Stroke Length	: 75mm
Operating Pressure Range	: 7 -120 Psi
Diameter	: 32mm

### 5/2 Solenoid Valve with LED



Physical view



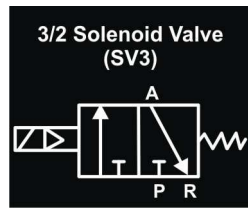
Symbol

Type : 5/2 (5 Port- 2 Way)  
 Pressure Range : 7 – 120 Psi  
 Operating Voltage : +24VDC

### 3/2 Solenoid Valve with LED



Physical view



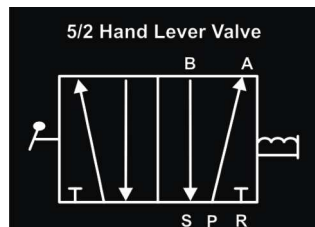
Symbol

Type : 3/2 (3 Port – 2 Way)  
 Pressure Range : 7 – 120 Psi  
 Operating Voltage : +24VDC

### Hand Lever Valve



Physical view



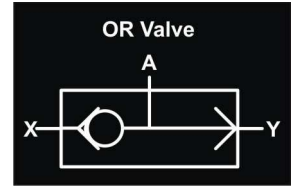
Symbol

Type : 5/2 (5 Port – 2 Way)  
 Pressure Range : 7 – 120 psi

### OR Valve (Shuttle Valve)



Physical view



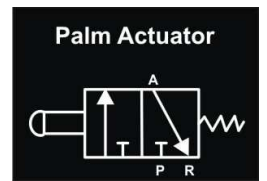
Symbol

Pressure Range : 21 – 174 Psi

### Pushbutton or Palm Actuator



Physical view



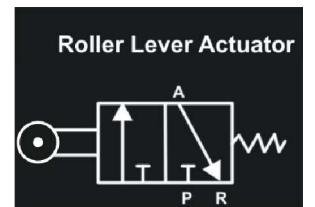
Symbol

Type : 3/2 (3 Port – 2 Way)  
 Pressure Range : 7 – 120 Psi

### Roller Lever Actuator



Physical view



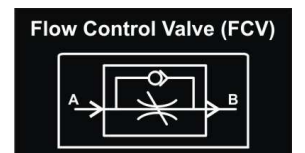
Symbol

Type : 3/2 (3 Port – 2 Way)  
 Pressure Range : 7 – 120 Psi

### Flow Control Valve



Physical view



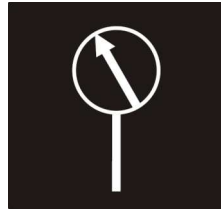
Symbol

Pressure Range : 7 – 120 Psi

### Pressure Gauge



Physical view



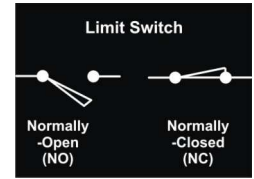
Symbol

Pressure Range : 0 to 150 Psi

### Limit Switch



Physical view



Symbol

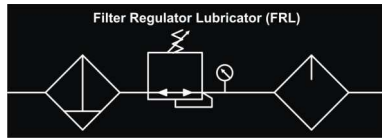
Type : Lever Type

Supply : +24V DC

### FRL (Filter Regulator Lubricator)



Physical view



Symbol

Max Supply Pressure : 142 Psi

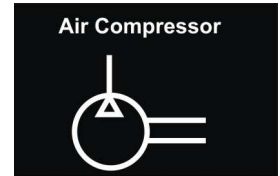
Regulating Pressure Range : 7 – 120 Psi

Filtration in Microns : 25 micron

### Air Compressor



Physical view



Symbol

Voltage : 220V/50Hz

Power : 0.75 HP

Pressure : 100 Psi (maximum)

Tank Capacity : 24 Liter

Dimension in mm : H1727 x W 1400 x D830

#### Included Accessories

4mm Patch Cord 30" (Red) : 5 nos.

4mm Patch Cord 30" (Black) : 5 nos.

4mm Patch Cord 30" (Yellow) : 5 nos.

4mm Patch Cord 30" (Blue) : 5 nos.

4mm Patch Cord 18" (Yellow) : 10 nos.

4mm Patch Cord 18" (Blue) : 10 nos.

RS232 to 4 Pin DIN Cable : 1 no.

USB to Serial Converter : 1 no.

PU tube : 15 meter

Tube cutter : 1 no.

Air Compressor : 1 no.

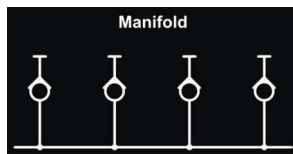
#### Windows OS Based PC (optional)

**Note:** Windows OS Based Computer is required to explore PLC experiments

### Manifold



Physical view



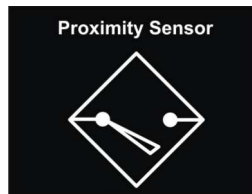
Symbol

Ports : 4 Port

### Proximity Sensor



Physical view



Symbol

Type : Inductive

Supply : +24V DC