

## **PNEUMATICS TRAINING SYSTEM**

**MODEL: PNE20**



### **FEATURES**

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- Compact, comprehensive, sturdy design
- Study of Pneumatic Circuits
- Modular design, easy to upgrade
- One-stop training solution for complete training of pneumatic, from basics to advanced

### **DESCRIPTION**

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NiYo Engineers' Pneumatic Training System is a comprehensive solution for all your training needs in Pneumatics. By using Pneumatic Training Lab, you can fulfill your need right from classroom training, basic hands-on training, electro- Pneumatic and PLC hands-on training, fault finding and troubleshooting practice to the most advanced training in designing and design validation.

Pneumatic Training System is modular, you can select the minimum configuration that suits your needs today and easily and quickly upgrade it to suit your future needs as and when it arises.

## LIST OF EXPERIMENTS

- Fundamentals of pneumatics
- Safety aspects of pneumatics
- Study of symbols, schematic diagrams, standards and ratings
- Study of transmission and distribution of air
- Study of pneumatic logic circuits
- Trouble shooting in pneumatic circuits
- Study of pneumatic fluid conditioning accessories
- Study of an air compressor
- Study of Operation of Signal Elements
- Latching of solenoid coils using Relay
- Understanding of Latching circuits
- Position sensing using sensors
- Creation of basic electro pneumatic circuits
- Twice pressure control circuit
- Study of basic, advanced and electro-pneumatic circuits

### • CLASS ROOM TRAINING MATERIAL

We provide a complete solution for your pneumatic lab. The first step in this is to impart classroom training. Products that aid your classroom training are:

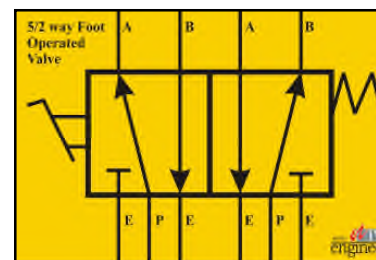
### • BOOKS

This is a comprehensive compilation of data on oil pneumatic theory, applications, symbols and details of the components. Neat diagrams and presentation of information makes it an invaluable tool in classroom training.

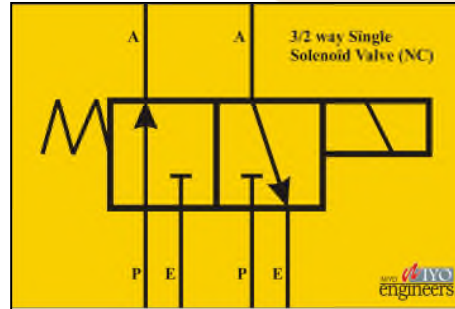
### • MAGNETIC SYMBOL SET (PNEUMATICS)

These magnetic symbols make it very easy to quickly draw various types of circuits, saving you the time and effort normally required to draw detailed symbols of components. Each symbol has magnetic strips on the rear, so that it can be fastened on any steel-backed white board. This makes it very easy to slide the symbols in and out, while explaining a circuit to students in the class. The symbols are constructed of long-lasting white plastic sheet, with printed symbols and are neatly kitted in a wooden box.

- 3/2 Push button Valve (NC)
- 3/2 Push button Valve (NO)
- 5/2 Hand-Lever Operated Direction Control Valve
- 5/3 Hand-Lever Operated Direction Control Valve
- 5/3 Double Solenoid Direction Control Valve
- 5/2 Double Solenoid Direction Control Valve
- 5/2 Single Solenoid Direction Control Valve
- OR Function Valve (Shuttle Valve)
- AND Function Valve



- Quick Exhaust Valve
- Non-Return Valve
- Uni-Directional Flow Control Valve
- Double Acting Cylinder, 2 nos.
- Single Acting Cylinder
- Filter Separator Lubricator
- Pressure Regulator
- Pressure Gauge
- Compressor



### Understanding Pneumatics Component Construction and Design

Once the basic concepts of pneumatics components and its symbols are understood, the trainees are now ready to move a step ahead by learning the construction of pneumatics components used in industry.

There are two options available for the trainers to achieve this goal.

- **Cut Section Components**

We provide a complete set of cut section components that will help trainees gain a better understanding of the parts and the functioning of various components. Our cut section components are manufactured using actual, real-life components that have been sectioned and painted to clearly delineate the working of each component.

Component	Qty	Component	Qty
3/2 way Directly Actuated Valve (Hand-lever)	1 no.	5/2-way Hand Lever Operated Valve	1 no.
3/2 way Indirectly Actuated Valve (With push button)	1 no.	3/2-way Mushroom Button Operated Spring Return Valve	1 no.
3/2-way Roller Lever Actuated Valve	1 no.	5/2-way Valve with Selector Switch	1 no.
3/2-way Pilot Operated Spring Return Valve	1 no.	5/2-way Solenoid Operated Spring Return	1 no.
5/2-way Double pilot Valve	1 no.	Quick Exhaust Valve	1 no.
One-Way Flow Control Adjustable Valve	1 no.	Double Acting Cylinder	1 no.



- **Transparent Components**

A transparent component is identical to an industrial real-life component, but with a transparent acrylic body. Spools and other internal parts can be moved easily. This helps trainees understand the parts of a component and its functioning. These components are for demonstration purpose only, can not be used for making circuits.

Component	Qty	Component	Qty
AND valve	1 no.	5/2-way Hand Lever Operated Valve	1 no.
OR Valve	1 no.	3/2-way Mushroom Button Operated Valve	1 no.
3/2-way Roller Lever Actuated Valve	1 no.	Double Acting Cylinder	1 no.
3/2-way Pilot Operated Spring Return Valve	1 no.	5/2-way Solenoid Operated Spring Return	1 no.
5/2-way Double pilot Valve	1 no.	Single Acting Cylinder	1 no.



## **Hands on Experience**

Having built a solid foundation with the study of symbols, component construction and its working, the trainees are now ready for hand-on experience. Using our Pneumatic Training System, trainees can build their own pneumatic circuits, ranging in complexity. They can then operate these circuits to verify the required operation. We also have add-on kits that can enhance training capabilities of the trainer kit.

- Base Station
- Storage station
- Basic Pneumatic components
- Add-on advanced Pneumatic components
- Add-on Electro Pneumatic components
- Add on PLC Trainer Kit Components
- Pneumatic and Electro Pneumatic Fault Kit

## **Base Station**

Base Station provides a working area to build and test various hydraulic circuits. The Base Station consists of



- 6-way distributor
- Service Unit, FRL with gauge
- Hand slide valve
- Electronic Panel Depending upon model selection chart

### Storage Station

The components that are not being used on Base Station at the moment can be stored in storage station that is Drawer Unit.

- Open type: Here the components are mounted on the surface the same way it is mounted on the work surface area.
- Drawer Unit: This is lockable. It has wheels. The drawer unit can be mounted in the Base Station or it can be kept separately.
  - Drawer dimensions: (Outer): 400mm (L) X 450mm (D) X 725mm (H)
  - Drawers: Two drawers, one free area.
  - Handle & single lock



### Basic pneumatic components

These components are supplied with one-touch fittings. Components can be quickly mounted using appropriate PCS plates.

Component	One sided operation	Two-sided operation	Component	One sided operation	Two-sided operation
5/2 pneumatic actuated valve, double sided	1 no.	2 nos.	3/2-way push button actuation NC valve	1 no.	2 nos.
3/2-way push button actuation NO valve	1 no.	2 nos.	5/2-way selector switch actuation valve	1 no.	2 nos.
Pressure Gauge	1 no.	2 nos.	One-way flow control valve	2 no.	4 nos.
3/2 roller lever NC valve	3 no.	6 nos.	Single acting cylinder	1 no.	2 nos.
5/2 pneumatic actuated valve, single sided	1 no.	2 nos.	Double acting cylinder	1 no.	2 nos.
Tube cutter	1 no.	2 nos.	Pressure regulator with gauge	1 no.	2 nos.
Plastic tubing PUN 4	10 m	20 m	T-Connector	2 nos.	4 nos.

### Add-on Advance Pneumatic components

These components are supplied with one-touch fittings. Components can be quickly mounted using appropriate PCS plates.

These Add-On components enhances level of learning from basic to advanced.

Component	One sided operation	Two-sided operation	Component	One sided operation	Two-sided operation
5/2 pneumatic actuated valve, double sided	2 no.	4 nos.	3/2-way push button actuation NC valve	4 no.	8 nos.
Dual pressure valve (AND)	1 no.	2 no.	5/2-way selector switch actuation valve	1 no.	2 nos.
Shuttle valve (OR)	1 no.	2 no.	Quick Exhaust Valve	1 no.	2 nos.
Time delay valve/adjustable	1 no.	2 no.	Weight with protection hood	1 no.	2 nos.
5/3-way hand-lever valve, ABPE short in center position	1 no.	2 no.	Pilot check valve	1 no.	2 no.
Pressure sequence valve	1 no.	2 no.	Single acting cylinder	1 no.	2 nos.
Double acting cylinder	2 no.	4 nos.	Pneumatic Counter Balance Valve	1 no.	2 nos.
Plastic tubing PUN 4	10 m	20 m	T-Connector	4 no.	8 nos.

### Add-on Electro pneumatics components

These components are supplied with one-touch fittings. Components can be quickly mounted using appropriate PCS plates.

These Add-On components help learning interfacing of electronics with pneumatics. In order to use these components Base Station with Electronic Panel is required.

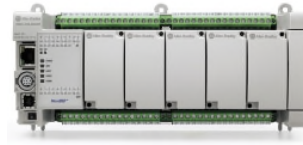
Component	One sided operation	Two-sided operation	Component	One sided operation	Two-sided operation
Relay, three-fold	1 no.	2 nos.	Signal input, electrical	1 no.	2 nos.
Proximity switch, reed contact	2 no.	4 nos.	Pressure switch	1 no.	2 nos.
5/2-way double solenoid valve with LED	2 no.	4 nos.	5/2-way single solenoid valve with LED	1 no.	2 nos.
Electrical limit switch, left actuated	1 no.	2 nos.	Electrical limit switch, right actuated	1 no.	2 nos.
Power supply unit	1 no.	2 nos.	Cables	1 set	2 set



### Add-On PLC Components

These Add-On components help learning interfacing of electronics and PLC with pneumatics. Trainees can learn how to write ladder logic, how to interface input and output of PLC with various pneumatics components. In order to use these components Base Station with Electronic Panel is required.

- PLC, 1 no
- Programming cable, 1no
- Ladder logic programming software, 1 no.
- Proximity sensor, capacitive, 1 no.
- Proximity sensor, inductive 1 no.
- Proximity sensor, optical, 1 no.
- I/O Card, 1 no.



### Add-On Pneumatics and Electro Pneumatic Fault Simulator

Our Pneumatic and Electro-Pneumatic Fault Kit is the perfect tool for the practical and application-oriented testing of all the knowledge the trainees have gained so far. By deliberately introducing faulty components in the circuit, we stimulate the trainees to think and logically diagnose and solve common faults in pneumatics circuits. This honing of their core engineering and problem-solving skills goes a long way in making them industry-ready and giving them a competitive edge in the job market.

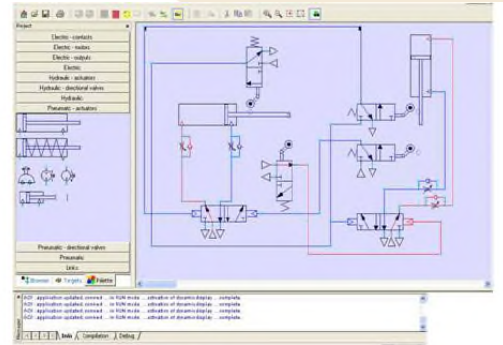
These components are supplied with one-touch fittings. Components can be quickly mounted using appropriate PCS plates.

Component	Qty	Component	Qty
One Way Flow Control Valve	1 no	5/2-way single solenoid valve with LED	1 no.
Inductive Sensor	1 no.	Limit Switch, Left Actuated	1 no.
Non-return Valve	1 no.	AND Valve	1 no.
OR Valve	1 no.		



### Simulation Software

Simulation Software is software for training in automation technologies that allows the user to try his / her programs on a virtual system before applying them to a physical system. It represents the ideal complement to training equipment which, in turn, enables a more efficient use of the laboratory. It can also be used independently of actual training systems. They provide dynamic design and simulation plus control of 2D and 3D virtual machines. This includes a virtual PLC to control the circuits / models under simulation and allows communication with our range of training systems



### Instruction Manual

Self-explanatory operating manual are supplied with each equipment. This contains step-by-step method of practical exercises along with safety and others aspects.



### Silent compressor

- Maximum Pressure: 8 kg/cm<sup>2</sup>
- Motor Power: 675 W
- FAD: 1CFM
- Duty cycle: 10%
- Tank capacity (50 lit)
- Noise: 48 dB (A)
- Pressure switch
- Power supply: 230V AC, 50 Hz



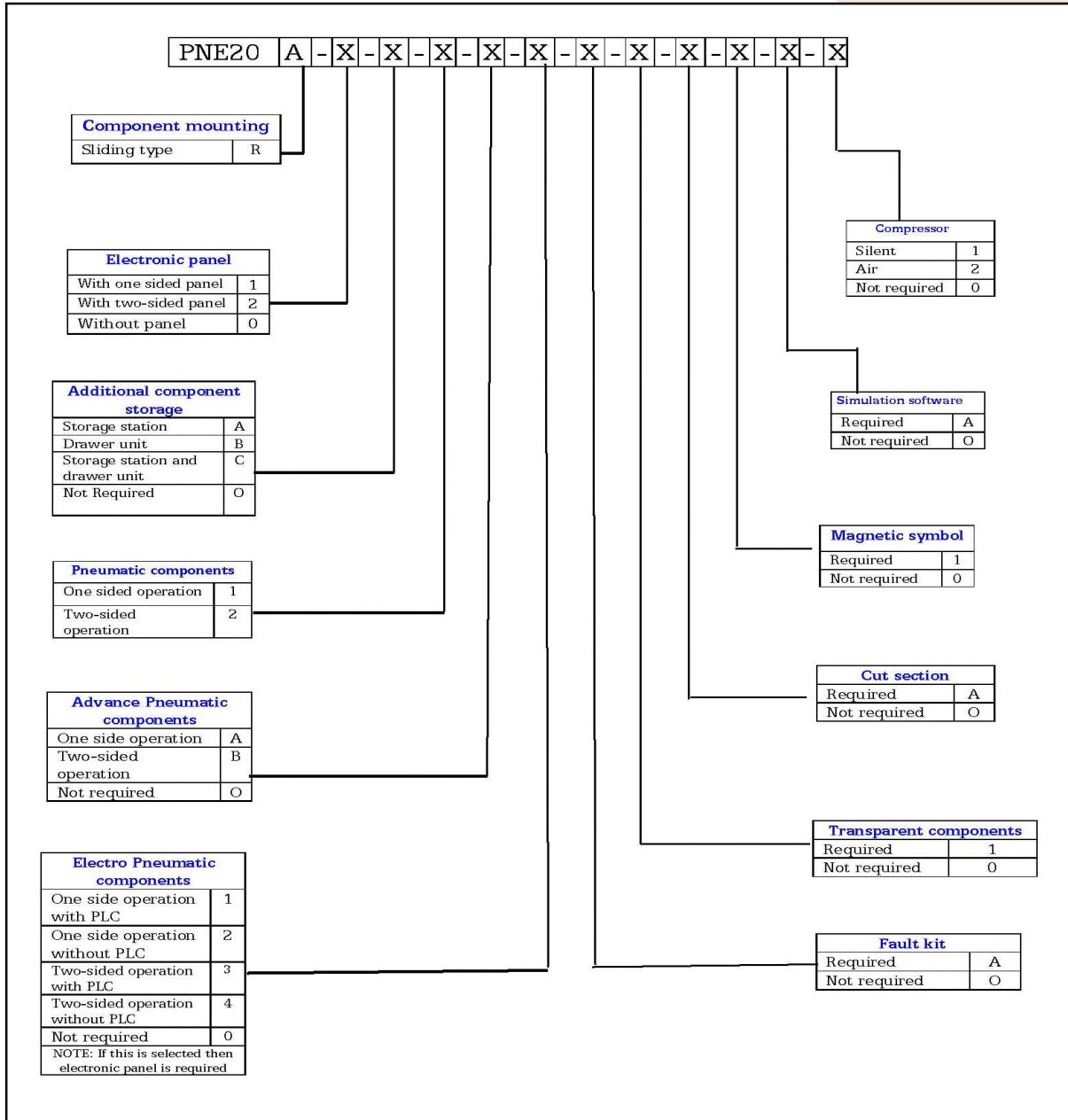
### Services Required

1. Electric supply
2. Pressurised Pneumatic air supply

### Weight and dimensions:

Model	Bare weight	Dimensions
Base station R model (without valve)	130 kg	1000 X 800 X 1950mm (H)
Storage station open type R model	60 kg	800 X 800 X 1310 mm (H)
Storage station drawer unit	40 kg	460 X 400 X 700 mm (H)

### Models selection chart



- Since research and development is an on-going activity, the specifications mentioned herein are subject to change without notice
- Photographs are indicative only

### NiYO Engineers

Unit 1B, Devgiri Industrial Estate, S. No. 17/1B Plot No. 14, Kothrud, Pune 411 029  
 INDIA, Tel-91 20 2546 5004, 2546 8051, 2546 7296 Telefax - 91 20 2546 8051  
 e-mail- [sales@niyoindia.com](mailto:sales@niyoindia.com) Web: [www.niyoindia.com](http://www.niyoindia.com)

