Learning Kit for Pneumatics Components

(Basic & Advance Training)

Model No.: LK-P01-R1

USER MANUAL & OPERATING INSTRUCTIONS

- Safety Rules
- Start-up Guide
- Operating the Baseboard
- Brief Theory of Components
- Components/Fixtures
- Additional Information

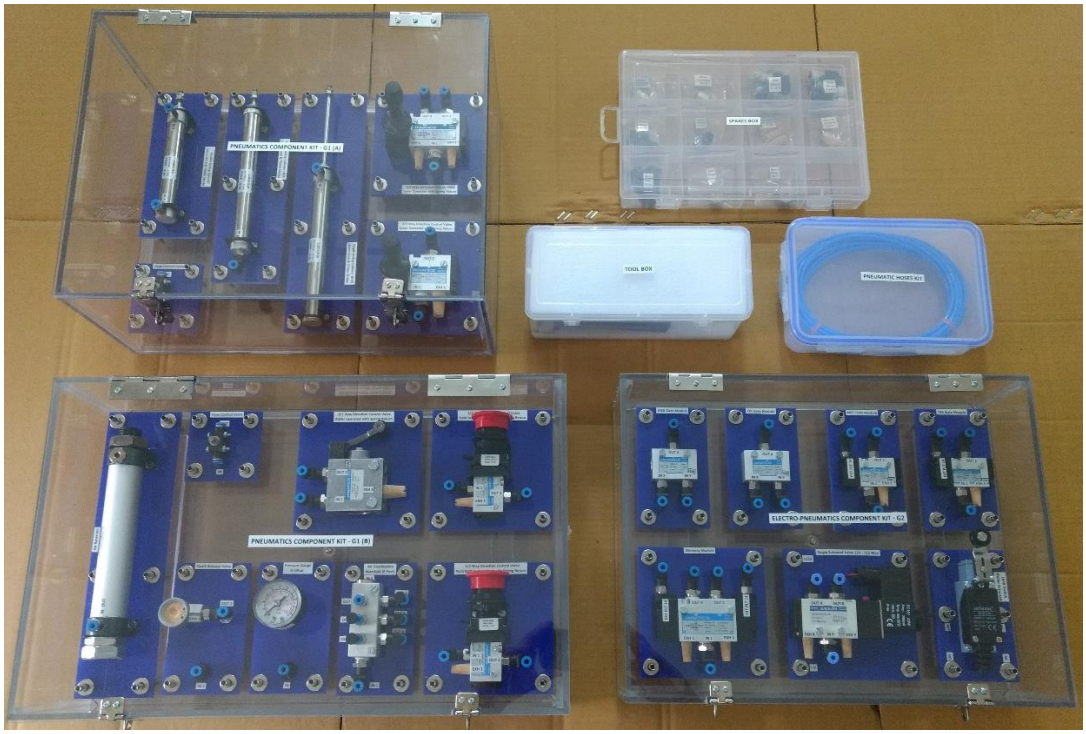


TABLE OF CONTENTS

SAFETY RULES

A safe work environment is not always enough to control all potential hazards.
You must be very cautious and work safely, all the times.

1. Never blow compressed air at anyone.
2. Don't turn the main air supply on until the circuit is connected up. Disconnected pipes can whip round and cause injury.
3. If air is leaking from a joint – turn the air off.
4. Always turn air off before altering the circuit.
5. Keep fingers clear off the piston rods.
6. Wear safety glasses when building and operating pneumatic systems.
7. Do not install pneumatic components with a method that supports with pipes.
8. Ensure space around the pneumatic component for installation, removal, wiring, and piping work.

START-UP GUIDE

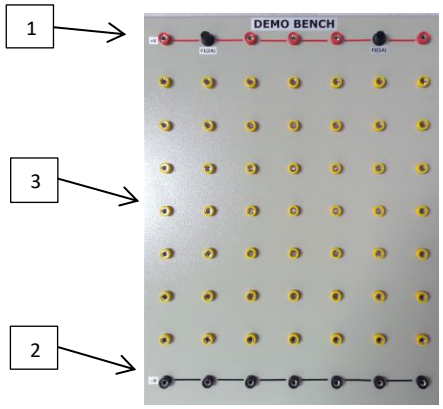
Checking the Contents

Sr. No.	Name	Type / Rating	Quantity
1.	Baseboard		1 unit
2.	Pneumatics Component Kit: G1 (A) ➢ Double Acting Cylinder ➢ Single Acting Cylinder (Normally Retracted) ➢ Single Acting Cylinder (Normally Extracted/Extended) ➢ 5/2 Way Directional Control Valve ➢ 3/2 Way Directional Control Valve ➢ Flow Control Valve	 16mm Bore / 75mm Stroke 16mm Bore / 75mm Stroke 16mm Bore / 75mm Stroke Lever operated Lever operated	 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit
3.	Pneumatics Component Kit: G1 (B) ➢ 3/2 Way Directional Control Valve ➢ 3/2 Way Directional Control Valve ➢ Air Reservoir ➢ Flow Control Valve ➢ Quick Release Valve ➢ Pressure gauge ➢ Air Distribution Manifold	 Roller operated Push button operated	 1 unit 2 unit 1 unit 1 unit 1 unit 1 unit 1 unit
4.	Electro-Pneumatics Component Kit: G2 ➢ AND Gate Module ➢ OR Gate Module ➢ NOT Gate Module ➢ YES Gate Module ➢ Memory Module ➢ Single Solenoid Valve 12V- 5/2 Way ➢ Limit Switch, Roller Actuated		 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit 1 unit
5.	Pneumatics Hoses Kit: ➢ 4mm Blue PU Tube	 450mm Long	 15 pcs
6.	Spare Box ➢ Male Connector ➢ Male Connector ➢ Male Elbow ➢ Male Elbow ➢ Male Elbow ➢ Bulk Head Union ➢ Silencer, Slotted head ➢ Silencer, Slotted head ➢ Plug Pin ➢ Port Plug ➢ Port Plug	 G1/8*4 M5*4 G1/8*4 G1/4*4 M5*4 0D 4 G1/8 G1/4 G1/8 G1/8 G1/4	 1 pcs 1 pcs 4 pcs 3 pcs 2 pcs 1 pcs 3 pcs 1 pcs 5 pcs 1 pcs 1 pcs
7.	Tool Box ➢ Tube Cutter ➢ Spanner ➢ Spanner ➢ Spanner ➢ Allen Key ➢ Allen Key ➢ Screw Driver ➢ Teflon Tape	 No. 8-9 No. 10-11 No. 14-15 5mm 6mm No. 921 12mm*10mtr	 1 pcs 1 pcs 1 pcs 1 pcs 1 pcs 1 pcs 1 pcs 1 pcs

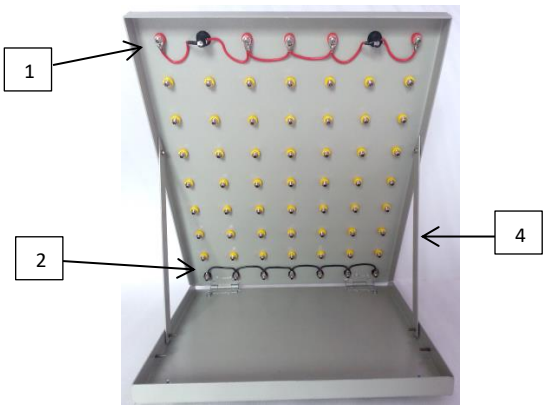
OPERATING THE BASEBOARD

Overview

Front view



Rear view



1 > Red Sockets (Internally connected together)
2 > Black Sockets (Internally connected together)
3 > Yellow Sockets (Individual)
4 > Folding Bracket

Operating the Demo Bench

- Baseboard is foldable type.
- Insert Folding bracket in bottom-plate screw to hold the front in angular position.
- Red sockets are internally connected together for +V distribution.
- Black sockets are internally connected together for –V distribution.
- Yellow sockets are individual for use of fixtures.
- In-built fuse at first red socket to protect total baseboard.
- In-built fuse at last red socket to protect particular circuit on baseboard.
- Various Pneumatics / Electro-Pneumatics components are provided as fixtures/kits.
- Pneumatics / Electro-Pneumatics components & their combinations can be demonstrated on this baseboard to understand it.

BRIEF THEORY OF COMPONENTS

PNEUMATIC CYLINDERS

Pneumatic cylinders convert the potential energy of compressed air into mechanical energy of applied force or the kinetic energy of motion.
There are two types of cylinders: 1) Single acting cylinder (SAC)
2) Double acting cylinder (DAC)

Single-acting cylinder:

A single acting pneumatic cylinder is a linear actuator and realizes a working stroke by filling the cylinder with compressed air. The return stroke is usually accomplished by a spring. The cylinder has one connection port that is used either to fill or vent the cylinder. Single acting cylinders have a spring inside the cylinder. A single acting cylinder works with compressed air to actuate the piston in one direction and spring force to return to the base position. Work can be performed in the air driven direction. The cylinder has one port that is used to both supply and vent compressed air.

Two types of single acting cylinders exist: spring return and spring extended. The most common type is the spring return cylinder.

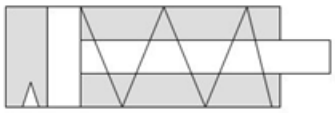
There are some advantages to use single acting cylinders over double acting cylinders: less tubing, less use of compressed air, and less wiring is needed for the system. Single acting cylinders also have disadvantages: the spring takes up space and limits the working stroke of the cylinder. Furthermore, the spring force reduced the pneumatic force and limits the resulting force of the cylinder.

The single acting cylinders can be specified by the following key parameters:

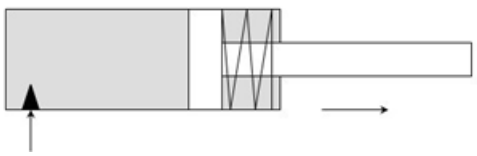
- Stroke
- Bore size
- Rod diameter
- Spring force
- System pressure

Single Acting Cylinder (Normally Retracted):

In the spring return cylinder (Normally Retracted), the spring is located between the front end of the cylinder and the piston (around the piston rod). In this design, the piston rod extends when compressed air is supplied to the cylinder. As soon as the air supply is cut off, the piston rod retracts by spring force. Below figure shows positions of cylinder.



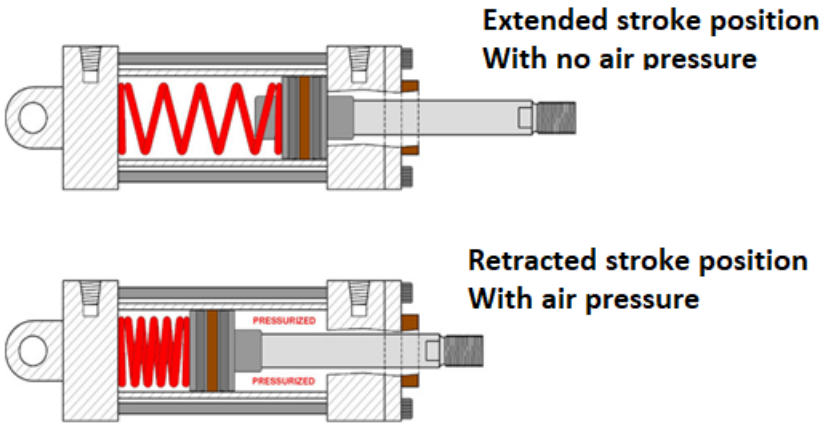
Rest state, No pressure applied. Cylinder is retracted.



Air pressure applied. cylinder extends. Spring is compressed.

Single Acting Cylinder (Normally Extracted/Extended):

The single acting normally spring extended cylinder works the other way around. In the spring extended cylinders, the spring is located between the piston and the rear end of the cylinder. The piston retracts when compressed air is supplied. When the air supply is switched off, the spring pushes the rod out.



The air supply is usually introduced through the front-end cap supply port. The rear end cap supply port is then used for air exhaust. Above figure shows spring extend air cylinder shown in extended stroke position with no air pressure introduced through the front-end cap supply port. Also, spring extend air cylinder shown in figure in retracted stroke position with air pressure introduced through the front-end cap supply port, thus spring is getting over.

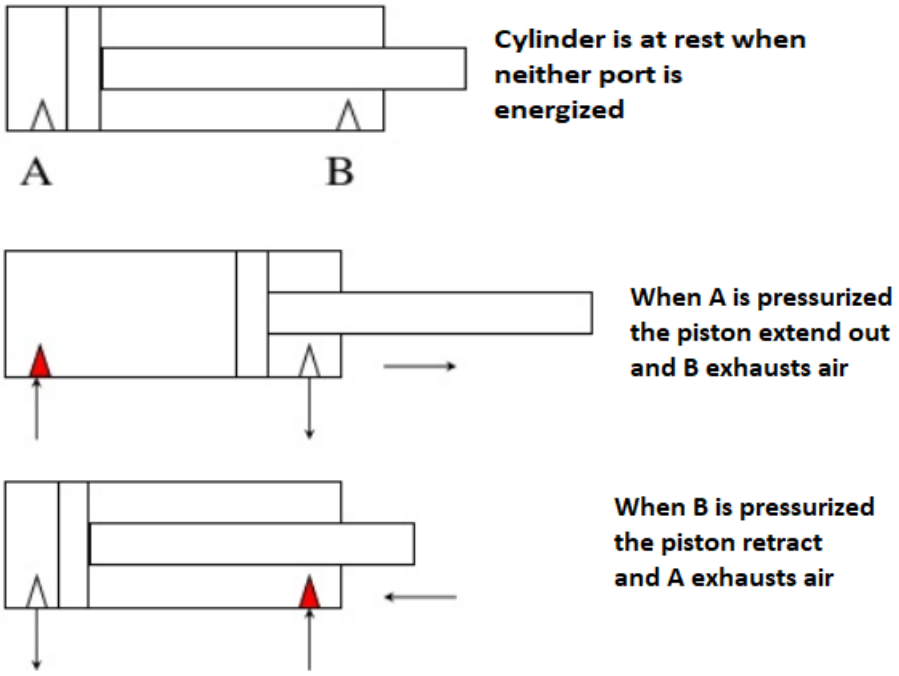
The stroke is the distance between the end and the base position (length of the movement). The bore size is the diameter of the piston. To choose the right cylinder, please follow the sizing method of the cylinder's manufacturer. The single-acting cylinder is normally controlled by a three-port valve, for example a pneumatic solenoid valve. One port connects to the source of compressed air, the second port is used to supply/vent air to the cylinder and the third port is an exhaust port.

Double Acting Cylinder:

A double acting pneumatic cylinder is one where the thrust, or output force, is developed in both extending and retracting directions. Double acting cylinders have a port at each end and move the piston forward and back by alternating the port that receives the high-pressure air. The force exerted by the compressed air moves the piston in two directions in a double acting cylinder. They are used when the piston is required to produce thrust not only on the advance movement but on the return. The thrust available on the retracting stroke is reduced due to the smaller effective piston area, but is only a consideration if the cylinder is to pull the same load in both directions.

A double acting cylinder consists the following elements:

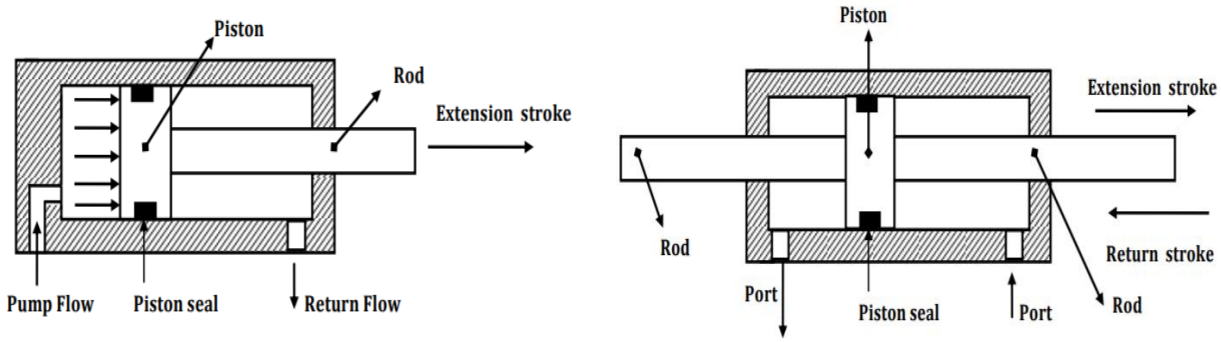
- Cylinder tube
- Plunger
- Piston rod
- Bronze rod guide
- Port connectors



Double acting cylinders are typically used in all applications where the thrusts and stroke lengths required are in excess of those available from single acting cylinders. Small double acting cylinders are also used for applications where positive end-of-stroke positions are required for both strokes.

There are two types of double acting cylinders:

- Double acting cylinder with piston rod on one side.
- Double acting cylinder with piston rod on both sides



Advantages:

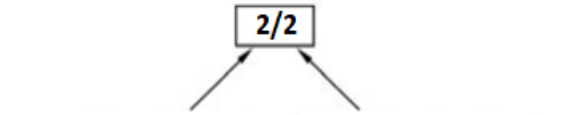
- Force builds up in both directions of movement
- Constant force (dependent on stroke)
- Strokes of several meters are possible

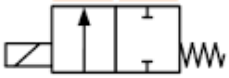
Disadvantages:

- Every movement uses compressed air
- No defined position in the event of compressed air failure

Directional Control Valve:

Directional control valves ensure the flow of air between air ports by opening, closing and switching their internal connections. Their classification is determined by the number of ports, the number of switching positions, the normal position of the valve and its method of operation. Common types of directional control valves include 2/2, 3/2, 5/2, etc. The first number represents the number of ports; the second number represents the number of positions. Below figure shows a 2/2 directional control valve that has two ports and two positions.





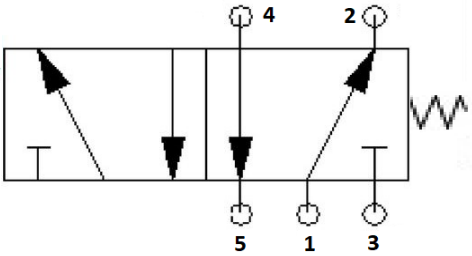
2/2 way symbol

DCV's operate in various ways like roller operated, push button operated and lever operated.

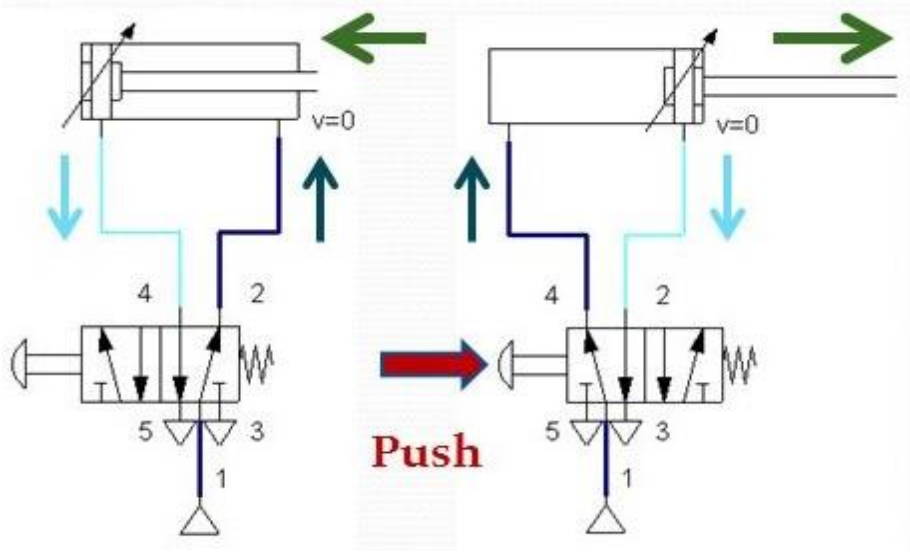
5/2 Directional Control Valve:

5/2 pneumatic valves are used for controlling double acting pneumatic cylinders. They have 2 output ports, commonly designated A & B or 2 & 4. They have one inlet port, designated P or 1, and two exhaust ports, designated R & S or 3 & 5. The 5/2 DCV could be actuated manually or by using pressure actuation (single pilot and double pilot) or by electrical actuation(solenoid).

In one position, inlet port P or 1 is connected to output port A or 2, while the port B or 4 is exhausted through exhaust port S or 4. This means the pneumatic cylinder is extended. In the other position of the valve, P or 1 is connected to port B or 4, and port A or 2 is connected to the exhaust port R or 3. This means the cylinder is retracted.



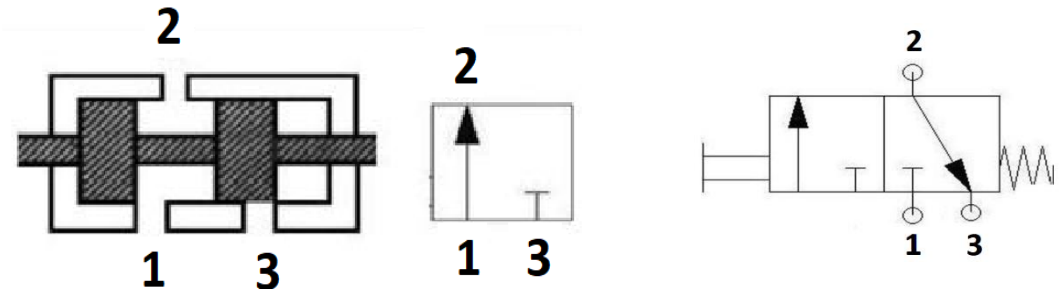
5/2-way valves have a movable spool with seals along the length in a cylinder. The valve ports connect to this central cylinder. By moving the spool through the cylinder, the valve ports are connected or blocked. Furthermore, the valve can be direct operated or pilot operated. With direct operation, the actuator is directly connected to the spool. With pilot operation, the valve uses the inlet pressure to help move the spool. The valve contains a small internal pneumatic cylinder that actuates the spool. The filling and emptying of this cylinder is controlled by the actuator.



Above figure shows 5/2 DCV is used to drive double acting cylinder. For double acting cylinder the power and exhaust paths are switched simultaneously. When button is pushed the supply at port 1 is connected to 4 and another port 2 is connected to exhaust port 3. When button is release port 1 is connected to port 2 and port 4 connected to exhaust 5.

3/2-way Directional Control Valve:

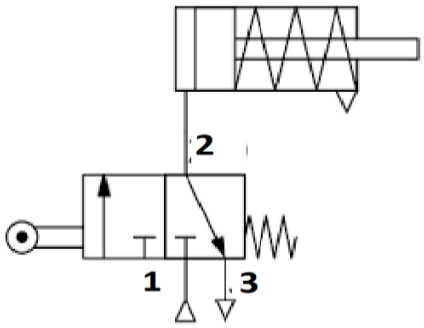
A 3/2 directional control valve has three ports. It has one inlet (1), one outlet (2) and one exhaust (3). This 3/2 directional control valve is used to control a single acting cylinder.



3/2 way valve
With roller operated

3/2 way with
push button

3/2 way with
lever operated

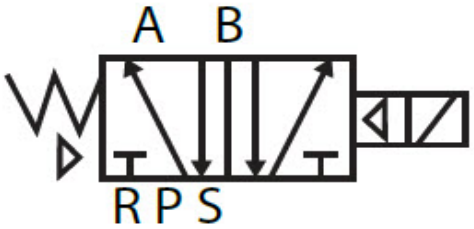


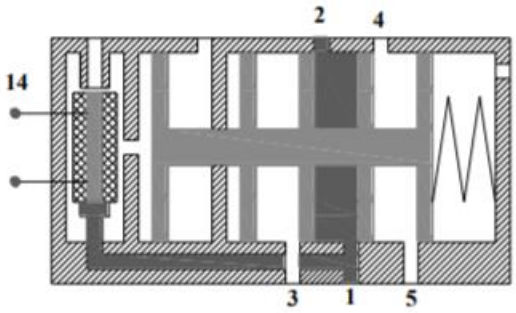
Actuating this valve result in allowing the flow from port 1 to port 2 and blocking the exhaust port 3.
In normally closed 3/2-way valve, a spring-loaded disk seal blocks the air flow from the air supply port 1 to the port 2. The port 2 is connected to exhaust port 3. Normally opens means compressed air flows through the valve. Above figure shows single acting cylinder driven by 3/2-way DCV.

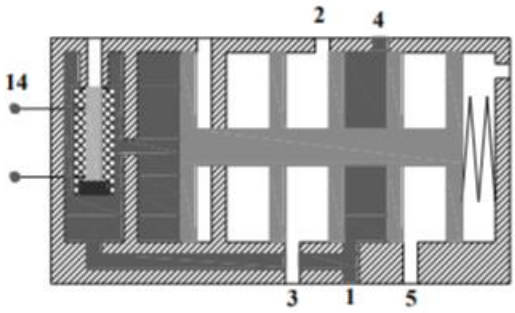
Single Solenoid Valve:

Pneumatic solenoid valves are used to control the flow direction of compressed air. A moving part inside the valve blocks or opens the port of the valve. The moving part is called spool or piston. A solenoid valve is an electromechanical device in which the solenoid uses an electric current to generate magnetic field and thereby operate a mechanism which regulates the opening of fluid flow in a valve. Here symbol represent P-INLET, A & B-OUTLET, R & S-EXHAUST.

In the initial position, all solenoids of an electrically actuated DCVs are de-energised and the solenoids are inactive. A double valve has no clear initial position, as it does not have a return spring. The possible voltage levels for solenoids are 12VDC, 24VDC, 110/120VAC, 220/230VAC.





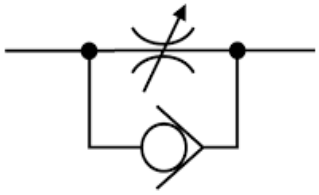


The cross section view of 5/2 way single solenoid in the normal and actuated positions are shown in Figure above, In normal position, port 1 is connected to port 2, port 4 is connected to port 5, and port 3 is blocked. When the rated voltage is applied to coil 14, the valve is actuated through an internal pilot valve. In actuated position, port 1 is connected to port 4, port 2 is connected to port 3, and port 5 is blocked. The valve returns to the normal position when the voltage to the armature coil is removed. This type of valves is normally used as final valve to control double acting cylinders.

Flow Control Valve:

A flow control valve is to regulate the pressure of a flow of fluid in a pneumatic system. Flow Control Valves are used to reduce the rate of flow in a section of a pneumatic circuit, resulting in a slower actuator speed. Unlike a Needle Valve, a Flow Control Valve regulates air flow in only one direction, allowing free flow in the opposite direction. Needle valve control flow in both directions.

The control action is limited to the air flow passing through the valve when it is open, maintaining a set volume per unit of time. Control valves normally respond to signals generated by independent devices such as flow meters or temperature gauges. The simplest flow control valves have an aperture which opens or closes in order to increase or slow down the flow rate. Loosen, or unlock the adjustment retaining lock on a flow control valve. Use the required key for some locking valves. Turn the locking nut on others by hand or with an adjustable wrench. Turn flow control valves in the clockwise direction to reduce the flow going through.



Two types of air flow control valves. Their selection and placement within a pneumatic circuit will greatly affect the function of an actuator.

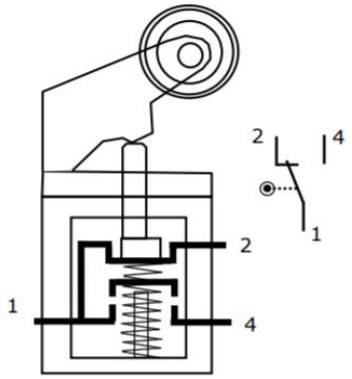
1. A meter-in flow control valve (also known as a reverse flow control valve) restricts the flow *to* an actuator.
2. A meter-out flow control valve regulates the exhaust flow *from* an actuator. These are the most commonly used air flow control valves.

Limit Switch / Roller Switch:

A limit switch is an electromechanical device that consists of an actuator mechanically linked to a set of contacts. When an object comes into contact with the actuator, the device operates the contacts to make or break an electrical connection. Any switch that is actuated due to the position of a fluid power component (usually a piston rod or hydraulic motor shaft or the position of load) is termed as limit switch. The actuation of a limit switch provides an electrical signal that causes an appropriate system response. Limit switches perform the same function as push button switches. Push buttons are manually actuated whereas limit switches are mechanically actuated.

There are two types classification of Limit switches depending upon method of actuations of contacts,

a) Lever actuated contacts
b) Spring loaded contacts



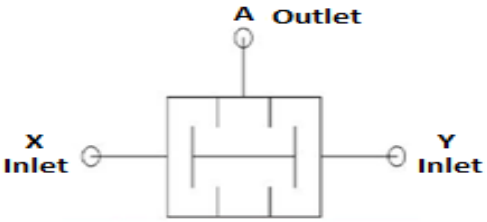
In lever type limit switches, the contacts are operated slowly. In spring type limit switches, the contacts are operated rapidly. Figure above shows a simplified cross-sectional view of a limit switch. Limit switches are used in a variety of applications and environments because of their ruggedness, ease of installation, and reliability of operation. They can determine the presence or absence, passing, positioning, and end of travel of an object.

Gate Modules (Valves):

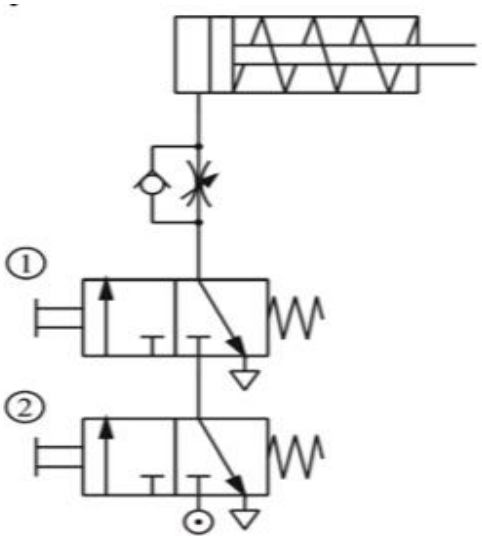
This contain variety of gates like AND gate, OR gate, NOT gate, YES gate, Memory module.

AND Gate Module:

It gives output compressed air signal if all inputs have compressed air signal applied at the same time. Below figure shows AND elements, which must receive two inputs before it provides an output. This ensures that two functions have completed before there is a command to continue the cycle. Connect AND inputs in a series when using more than two inputs. The first AND receives signals one and two while the output of this element hooks to one input of the second AND. The other input of the second AND receives the third signal, making three inputs necessary before giving an output.



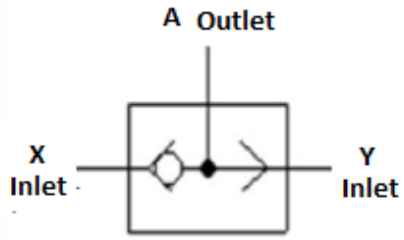
Another name for an AND function is interlock control. This means control is possible only when two conditions are satisfied. A classic example is a pneumatic system that works only when its safety door is closed and its manual control valve is operated. The flow passage will open only when both control valves are operated. Below figure shows the circuit diagram of an AND function circuit. The cylinder will work only when both valves 1 and 2 are operated.



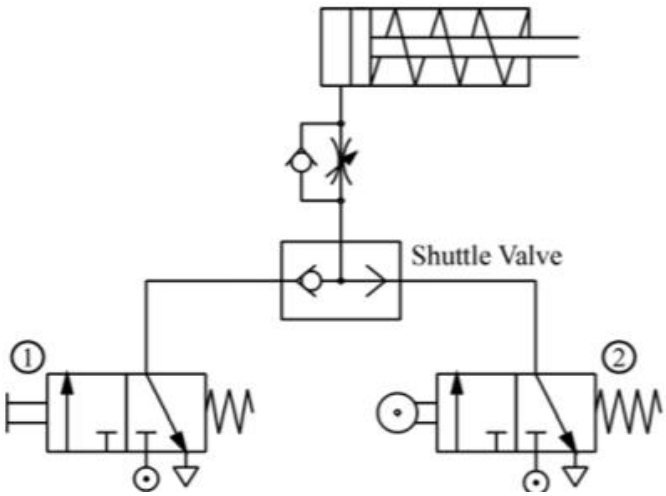
X	Y	Z
0	0	0
0	1	0
1	0	0
1	1	1

OR Gate Module:

It gives output compressed air signal if any input has compressed air signal. Figure shows the symbol for an OR element. In pneumatic system shuttle valve is work as an OR gate. If a compressed air signal is applied to input X and Y, this will produce a signal output Z. If there is no signal, there is no output signal.



The single acting cylinder in a below figure can be operated by two different circuits. Examples include manual operation and relying on automatic circuit signals, that is, when either control valve 1 or control valve 2 is operated, the cylinder will work. Therefore, the circuit shown in possesses the OR function. However, if the output of two 3/2 directional control valves are connected through the port of a triode, the air current from control valve 1 will be released through the exhaust of control valve 2, and so the cylinder will not work. This problem can be solved by connecting a shuttle valve to the port of the triode.

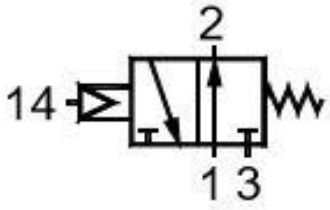


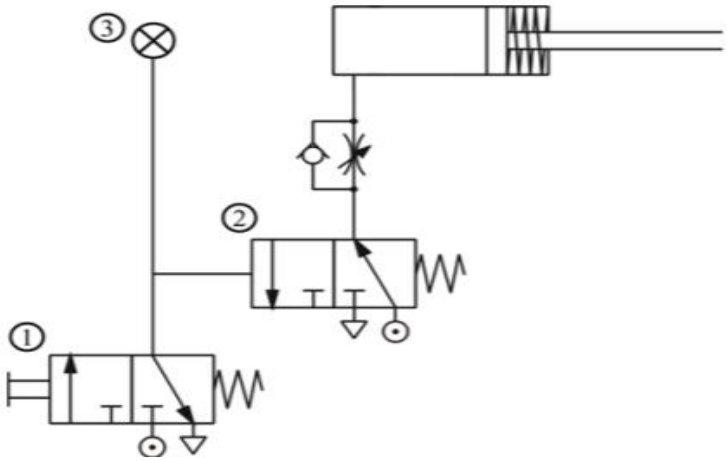
X	Y	Z
0	0	0
0	1	1
1	0	1
1	1	1

The OR circuit has two inputs and single output. The aim is to be able to extend the piston rod of a cylinder with two different input elements, S1 and S2. The contacts of two pushbuttons are arranged in parallel branches as shown in diagram. If at-least one of two push-button is pressed, the solenoid valve switches to actuated position and the piston rod advances.

NOT Gate Module:

Another name for a NOT function is inverse control. Figure shows the symbol for a NOT element, which is a normally open 3-way valve. Below Symbol represents 1-INLET, 2-OUTLET, 3-EXHAUST, 14-EXTERNAL PILOT.

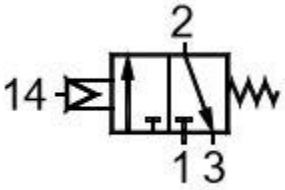




In order to hold or lock an operating conveyor or a similar machine, the cylinder must be locked until a signal for cancelling the lock is received. Therefore, the signal for cancelling the lock should be operated by a normally open type control valve. However, to cancel the lock, the same signal must also cancel the locks on other devices, like the indication signal 3 in above figure. Figure shows how the normally closed type control valve 1 can be used to cut off the normally open type control valve 2 and achieve the goal of changing the signal.

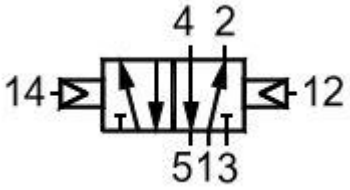
YES Gate Module:

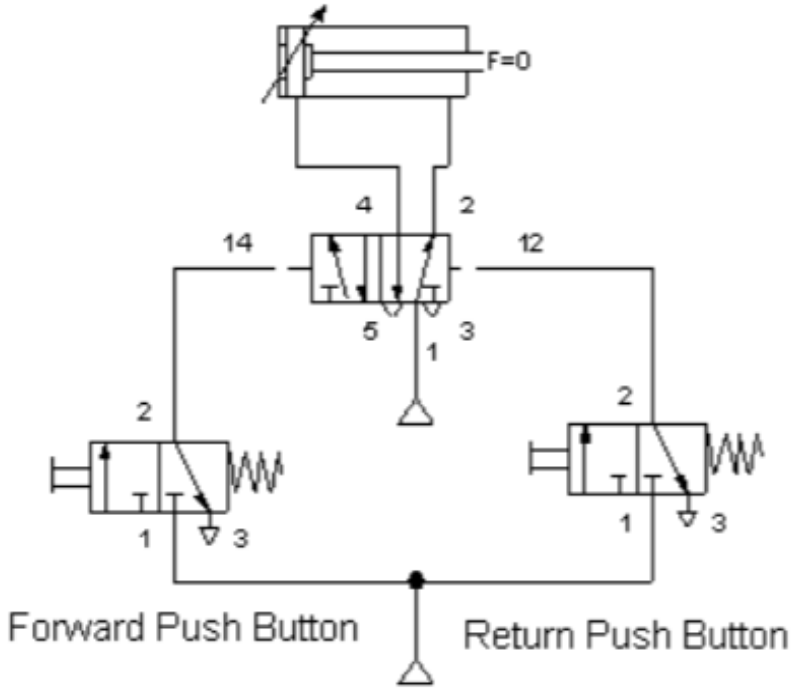
In contrast, a YES element has two inputs which obtain an output, but the designer has the choice of which input pairs with the output. Using this feature can amplify a weak signal. The weak signal pilots the valve open while the through signal comes from a full pressure supply. The YES in this situation is an active element. Below Symbol represents 1-INLET, 2-OUTLET, 3-EXHAUST, 14-EXTERNAL PILOT.



Memory Module:

Memory valve is also called as the Double pilot valve. With the actuation of Forward push button, the output signal activates the set pilot port 14 of final control valve. This result forward motion of the cylinder Now even if this push button is released the final control valve remains in the actuated status as the both the pilot ports are exposed to the atmosphere pressure and the piston remains in the forward end position. In below symbol 1-INLET, 2 and 4-OUTLET, 3 and 5-EXHAUST, 12 and 14 EXTERNAL pilot.

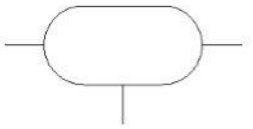




In order to retract the cylinder, the Return push button is activated. This will convey reset signal from signal source to the pilot port of final control valve 12. The piston retracts. Now even if the Return push button is released the status of the cylinder will not change.

Air Reservoir:

An air reservoir, sometimes referred to as a compressed air tank, is an integral part of any compressed air system. The main purpose of this is to act as temporary storage to accommodate the peaks of demand from your system and to optimize the running efficiency of your plant. The air is compressed slowly in the compressor. But since the pneumatic system needs continuous supply of air, this compressed air has to be stored. The air receiver smoothens the pulsating flow from the compressor. It also helps the air to cool and condense the moisture present. The air receiver should be large enough to hold all the air delivered by the compressor. The pressure in the receiver is held higher than the system operating pressure to compensate pressure loss in the pipes. Also, the large surface area of the receiver helps in dissipating the heat from the compressed air.



Most standard fixed speed and variable speed drive compressors can deliver compressed air at up to 175 psig (12bar), psig means pounds per square inch. However, majority of industrial facilities operate between 100-125 psig (7-8 bar). Depending on your facility's needs, the air receiver's maximum pressure should be sized accordingly. For example, if your fixed speed compressor is rated to deliver maximum of 125 psig (8 bar), the air receiver should be rated at the minimum of 150 psig (10 bar).

When it comes to sizing of an air receiver, a good rule of thumb to remember is to allow 3-4 gallons for each CFM or 10-15 litres for each litres/second of compressed air depending on the type of an air compressor used and the application.

Similar to sizing of an air compressor, there are a number of factors that should be considered in identifying the right size of air receiver for installation. It is highly recommended to consider the following factors:

1. Minimizing pressure fluctuations/drops:

An air receiver can be used to minimize pressure fluctuations that could have an impact on the production process and the quality of your end product. Selecting the right air tank for your compressor requires you to be mindful of two values: your compressor's output pressure and what your application needs at the point of use. Note that the compressed air stored in your air receiver is only useful as long as its pressure is sufficient for the process which uses it.

2. Meeting short term peak air demands:

If the demand for compressed air changes drastically throughout the day, it is important to account for the spikes in the demand to ensure the system pressure does not drop below an acceptable level. An air receiver provides storage to meet short term peak air demands that the compressor cannot meet. Depending on the time of day, the shift pattern or even unusual demand (e.g. occasional use of a sandblaster or an abrasive media blaster), your air requirement may vary.

3. Energy considerations:

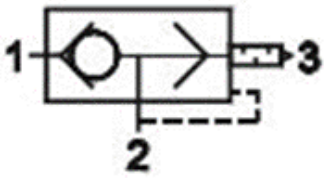
Using an air receiver can help reduce energy consumption of compressed air system by enabling load/unload (fixed speed) compressors to operate on a longer cycle and with tighter pressure bands. Having properly sized tank and more air than is required will reduce the potential of trim compressor starting up to meet increased flow demand, which can have substantial savings on your energy consumption. This will also prevent pressure fluctuation and frequent motor starts, while providing steady pressure and extending the life of the compressor.

4. Safety considerations:

If needed, an air receiver will provide a supply of air to enable production processes and systems to be safely shutdown in an emergency situation.

Quick Release Valve:

It is also known as QEV valves, QEVs, or quick dump valves, Quick release Valves are designed to increase the cycle speed of a cylinder in a pneumatic system. Depending upon actuation requirements, installing a pneumatic quick release valve at the blind end or rod end of cylinder will result in rapid retraction or rapid extension. When pressure is removed from the quick release valve's input port, backflow at the output port to unseat the internal components of the valve. This entire process results in the relief of large amounts liquid flow within the smallest amount of possible time. These quick release valves are available in both push to connect and threaded ports.



These valves work by increasing the speed of the cylinder rod in order to dump the exhaust air, at the port of the cylinder directly. The air is not directed at the back through the control valve. One quick release is used in each port of the cylinder to ensure an increase in the speed of the rod in both directions.

The use of a quick release valve helps to increase the cycling speed that ensures a much smaller and considerably smaller valve to be effectively used for the process. The air which enters the first port through the control valve, in effect bends the diaphragm to seal the third port, and enter through the second one. With the shift in the control valves, the exhaust air exits through the cylinder by the second port, which in turn pushes the diaphragm up at the same time sealing the first port. This way the air is allowed to exhaust through to the atmosphere through the third port.

The application of a quick release valve involves the installation of the fitting in the inlet of the spring return of a pneumatic cylinder or a double acting cylinder. They are available in a variety of shapes and sizes and are used in the industry to speed up the performance of a moving cylinder, evacuate air directly out into the atmosphere and increase the cylinder rod reaction time, or valve actuator.

Pressure Gauge:

A pressure gauge is the instrument used for measuring fluid pressures in both hydraulic and pneumatic circuits and generally determines the difference in pressure between the fluid and the local pressure. Given that most pressure gauges measure the difference between the pressure of the liquid and the local atmospheric pressure, the latter must be added to the value indicated by the pressure gauge to find the absolute pressure. A negative reading on the gauge is caused by a partial vacuum. Pressure gauges are used to measure gauge pressure that vary between 0-1 kg/cm2 (Bar) and between 0-10,000 kg/cm2 (Bar). The gauge accuracy may be between 0.1 and 2% of full scale, depending on the material, design and precision of the parts.

Pneumatic gauges are come in diameters of 40, 50and 63mm. Pressure gauge can be vertical or mounted and can also be designed for mounting on a panel using a frontal ring or flange. Ranges for Pneumatic gauges are 0-1 bar, 0-10 bar and 0-20 bar.

Pressure gauge are normally installed on ports, portable compressor, industrial equipment, hydraulic and pneumatic system, instrumentation and pressurized container. The gauge can be mounted to a minimex hose, tubing joint, instant fitting or valve. Pressure gauges are protected using a rubber protector or an inline mounted valve, 90^{o} valve with switch or panel-mounted switch.

Air Distribution Manifold:

Pneumatic manifolds provide a convenient junction point for the distribution of fluids or gases and are used to provide pneumatic power to two or more locations to supply multiple tools. Simply thread **pneumatic fittings** into the ports of the distribution block to produce an organized method of supplying multiple lines from a single source. Air manifolds come in various port options and different material types for low and high-pressure applications.

Advantages:

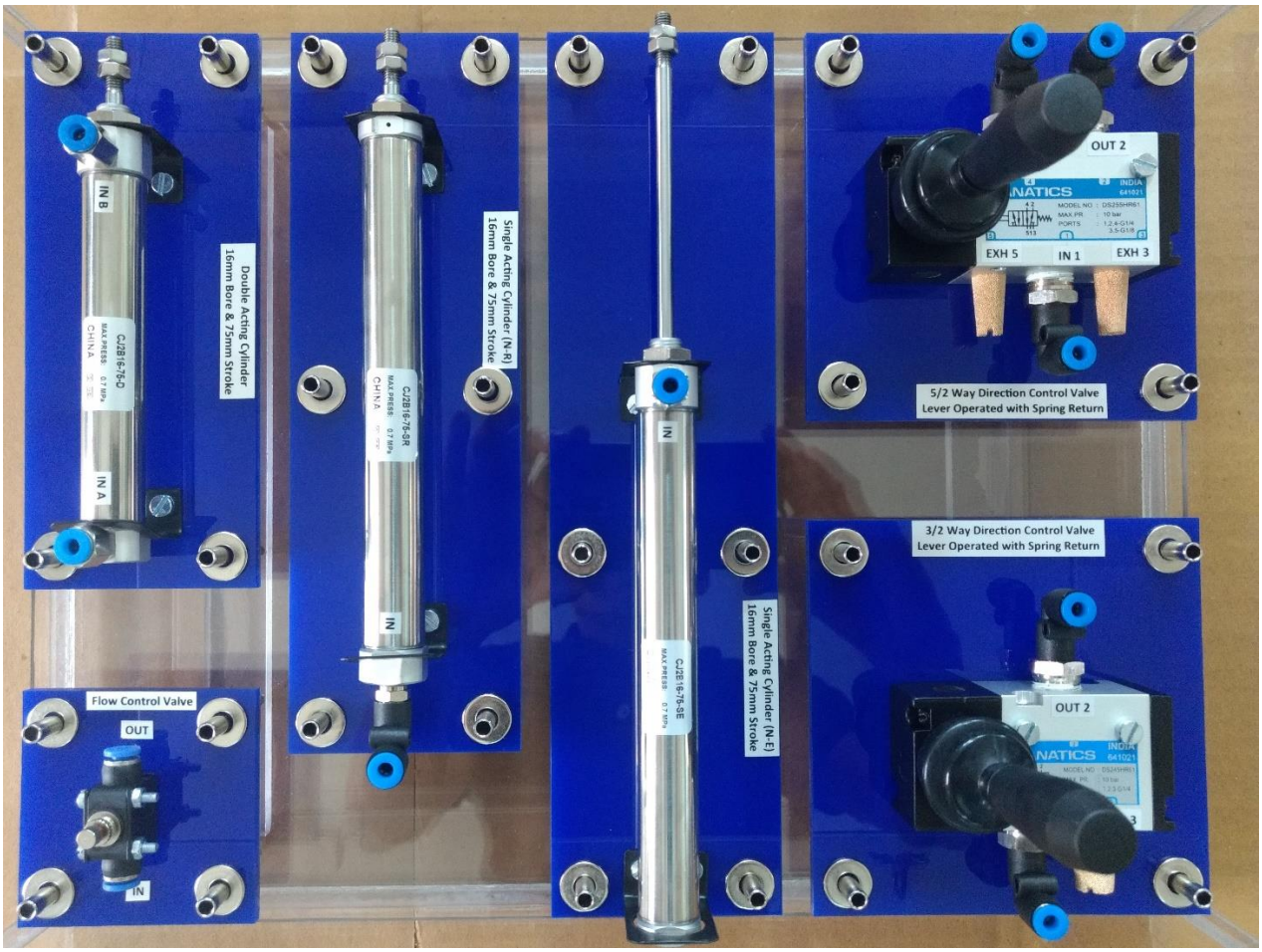
- 2 to 10 station air manifolds
- Variety of sizes & configurations
- Aluminium, brass, stainless steel, polypropylene & nylon materials
- Aluminium pneumatic manifolds are black anodized for corrosion resistance
- Precision machined

PRECAUTIONS

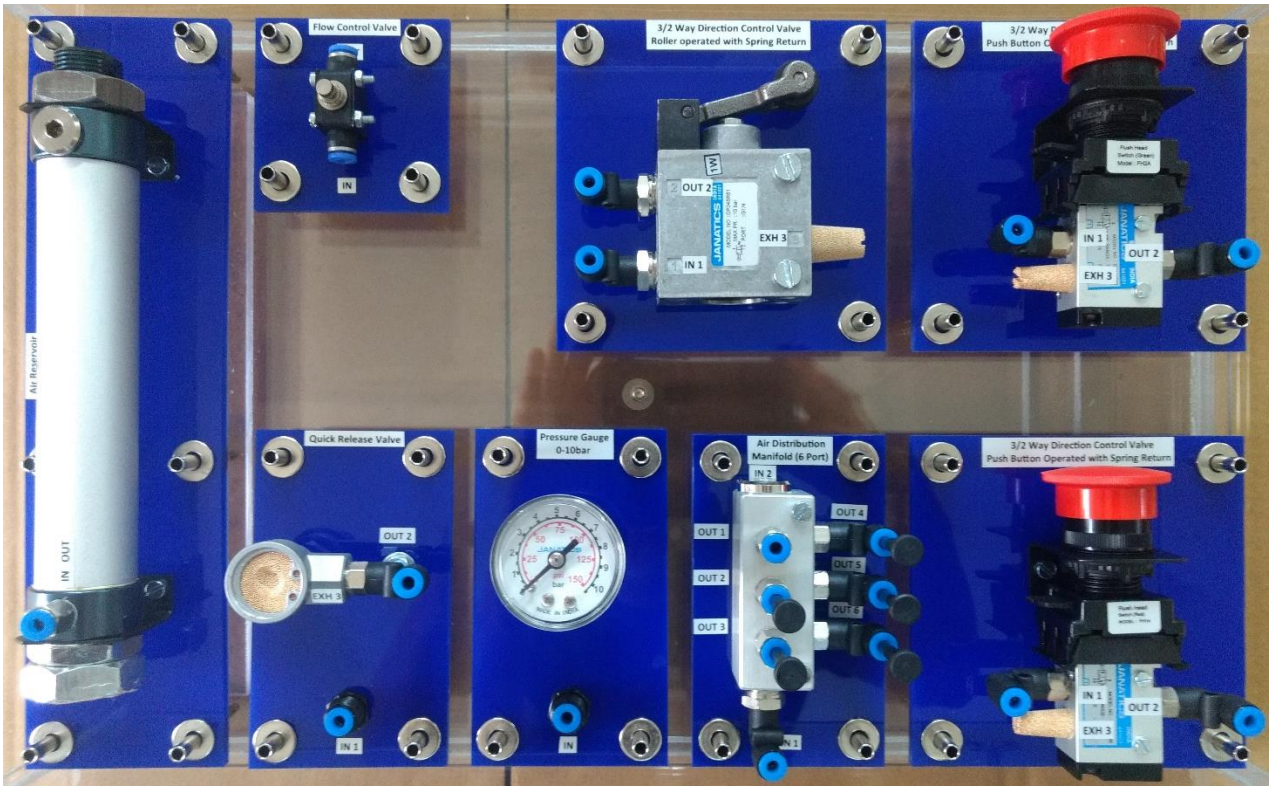
1. Compressed air can cause serious damage to the human body if they enter the body through ducts like the oral cavity or ears.
2. Never spray compressed air onto anyone.
3. Under high temperature, compressed air can pass through human skin.
4. Compressed air released from the exhaust contains particles and oil droplets, which can cause damage to eyes.
5. Even though the pressure of compressed air in pipes and reservoirs is relatively low, when the container loses its entirety, fierce explosions may still occur.
6. Before switching on a compressed air supply unit, one should thoroughly inspect the whole circuit to see if there are any loose parts, abnormal pressure or damaged pipes.
7. A loose pipe may shake violently due to the high pressure built up inside it. Therefore, each time before the system pressure is increased, thorough inspection of the entire circuit is required to prevent accidents.
8. As the force produced by pneumatic cylinders is relatively large, and the action is usually very fast, you may suffer serious injuries if you get hit by a cylinder.
9. Switches should be installed on the compressed air supply unit to allow easy and speedy control of air flow.
10. In case of a leakage, the compressed air supply unit should be turned off immediately.
    The compressed air supply unit must be turned off before changes can be made to the system

COMPONENTS / FIXTURES

TF BOX – G1 (A)



TF BOX – G1 (B)


Air Reservoir
IN OUT
Flow Control Valve
IN
3/2 Way Direction Control Valve
Roller operated with Spring Return
OUT 2
EXH 3
IN 1
JANATICS
3/2 Way D
Push Button C
IN 1
OUT 2
EXH 3
Quick Release Valve
OUT 2
EXH 3
IN 1
Pressure Gauge
0-10bar
IN
Air Distribution
Manifold (6 Port)
IN 2
OUT 1
OUT 2
OUT 3
OUT 4
OUT 5
OUT 6
IN 1
3/2 Way Direction Control Valve
Push Button Operated with Spring Return
IN 1
OUT 2
EXH 3

TF BOX – G2


AND Gate Module
OUT A
IN X
IN Y
OR Gate Module
OUT A
IN X
IN Y
NOT Gate Module
EXT PLT 14
OUT 2
IN 1
EXH 3
YES Gate Module
EXT PLT 14
OUT 2
IN 1
EXH 3
Memory Module
EXT PLT 14
OUT 4
OUT 2
EXT PLT 12
EXH 5
IN 1
EXH 3
Single Solenoid Valve 12V - 5/2 Way
+12V
OUT A
OUT B
EXH R
IN P
EXH S
--V
Limit Switch Roller Actuated
ON
NC

SPARES BOX


Male Connector G1/8*4
Male Connector M5*4
Male Elbow G1/8*4
Male Elbow G1/4*4
Male Elbow M5*4
Bulk Head Union
Silencer Sl Head G1/8
Silencer Sl Head G1/4
Plug Pin 4mm
Port Plug G1/8
Port Plug G1/4

TOOL BOX

PNEUMATIC HOSES KIT

ADDITIONAL INFORMATION

Specifications

1. Demo Bench -- a) Type: Foldable
b) Red row: 1 row with 5 sockets (Internally connected together)
c) In-built fuse at first & last Red socket
d) Black row: 1 row with 7 sockets (Internally connected together)
e) Yellow row: 7 rows with 49 sockets (Individual)
f) Dimensions: 360x485x300mm (W x H x D)

2. Pneumatics Components Kit – a) Double acting cylinder: NBSANMINSE make, part no.: CJ2B 16-75-D/ MAL16*75
b) Single acting cylinder (N-R): NBSANMINSE,
part no. CJ2B 16-75-SR (CDJ2B16-75-S)
c) Single acting cylinder (N-E): NBSANMINSE,
part no. CJ2B-16-75-SE (CDJ2B16-75-T)
d) 5/2-way DCV (Lever Operated): Janatics make, part no.: DS255HR61
e) 3/2-way DCV (Roller Operated): Janatics make, part no.: DP045R61
f) 3/2-way DCV (Push Button Operated): Janatics make, part no.: DS244P60-MP1A
g) 3/2-way DCV (Lever Operated): Janatics make, part no.: DS245HR61
h) Air reservoir: MACHIFIT Make, part no.: MAL25*100
i) Flow control valve
j) Quick release valve: Janatics make, part no.: GQ0150
k) Pressure gauge: Janatics make, part no.: A2G02
l) Air distribution manifold.: Janatics make, part no.: WJ03066160

3. Electro-Pneumatics Kit – a) AND gate module: Janatics make, part no.: GA0160
b) OR gate module: Janatics make, part no.: GB0160
c) NOT gate module: Janatics make, part no.: DS234ER60
d) YES gate module: Janatics make, part no.: DS2444ER60
e) Memory module: Janatics make, part no.: DS255EE61

4. Pneumatic Hoses Kit – a) PU tube 4mm OD, Blue: Janatics make, part no.: WH00B04

5. Spares – a) Male connector, G1/8*4: Janatics make, part no.: WP2110450
b) Male connector, M5*4: Janatics make, part no.: WP2110470
c) Male elbow, G1/8*4: Janatics make, part no.: WP2210450
d) Male elbow, G1/4*4: Janatics make, part no.: WP2210451
e) Male elbow, M5*4: Janatics make, part no.: WP2210470
f) Silencer slotted head, G1/8: Janatics make, part no.: AS160
g) Silencer slotted head, G1/4: Janatics make, part no.: AS161
h) Port plug, G1/8: Janatics make, part no.: WAP060
i) Port plug, G1/4: Janatics make, part no.: WAP061

6. Tool Box – a) Tube cutter: Janatics make, part no.: WC1
b) Spanner: Taparia make, No.8-9
c) Spanner: Taparia make, No.10-11
d) Spanner: Taparia make, No.14-15
e) Allen key, 5mm: Taparia make
f) Allen key, 6mm: Taparia make
g) Screw driver, No.921: Taparia make
h) Teflon tape: Abro make, 12mm*10mtr