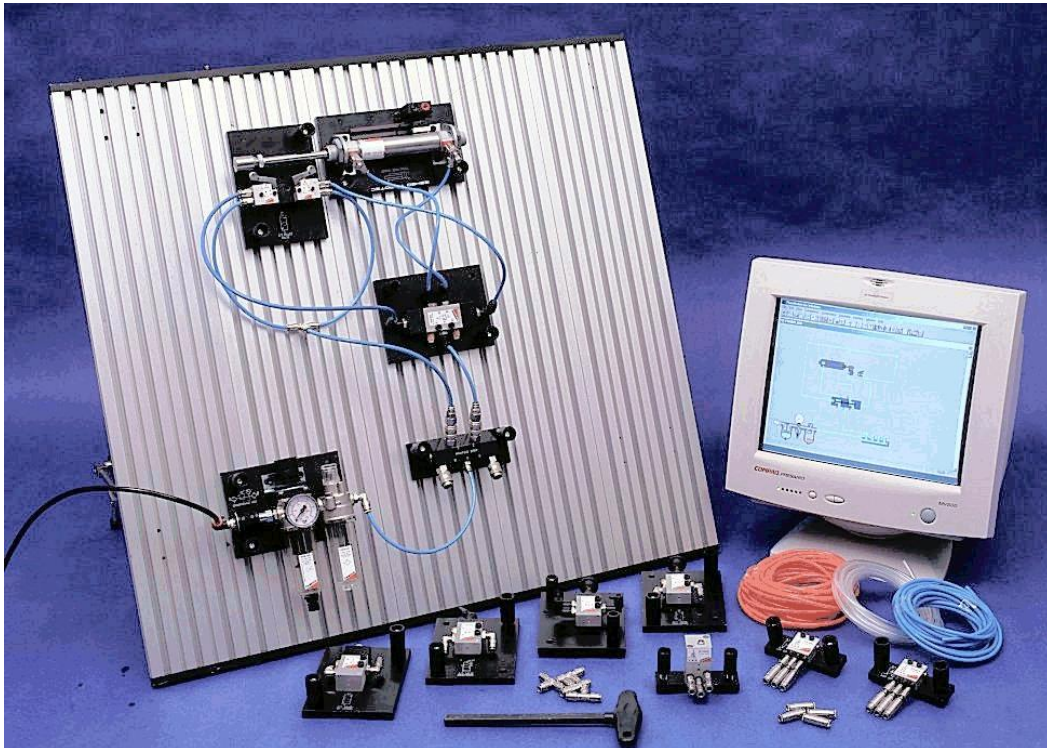


PneuFlex



USER MANUAL

Catalog #100128 Rev. 1

intelitek ®

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PneuFlex User Manual

Catalog No. 100128 Rev. I

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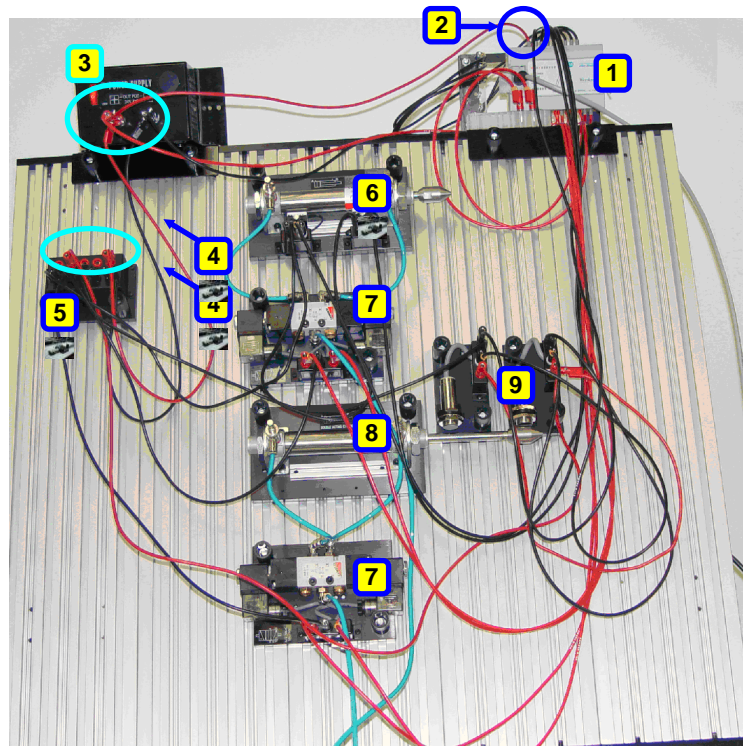
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1. Installation

PneuFlex is an educational panel for the assembly of pneumatic circuits and systems. It can be used to teach the fundamentals of pneumatics at both basic and advanced levels.

The PneuFlex system may be ordered with either a single-sided or double-sided slotted aluminum panel. The single-sided panel can be laid flat or raised to any angle. Pneumatic components are attached to the panel. The components can easily be repositioned, coupled and uncoupled, to form a variety of pneumatic or electro-pneumatic circuits.



1. PLC MicroLogix
2. Red COM Cable
3. Power Supply Connections
4. Power Supply Cables (Red and Black) to Electrical Distributor
5. Electrical Distributor Connections
6. Double Acting Cylinder with Magnetic Sensors
7. 5/2 Sol-sol Control Valves
8. Double Acting Cylinder without Magnetic Sensors
9. Inductive Proximity Sensors

Figure 1: MicroLogix Connected to Power Supply and Electro-PneuFlex Panel

1.1. SETTING UP THE PANEL

Single-sided panel:

1. Place the PneuFlex panel on a sturdy surface and unfold the legs.
2. Adjust the panel to the desired position and angle and then tighten the bolts which fix the legs in place.

Double-sided panel (refer to the diagram below):

1. Loosely connect the two sides of the panel by means of the shafts (6). Do not yet tighten the locking nuts (5).
2. Connect the tops of the two sides by means of the trapezoid blocks (7), and tighten the screws.

3. Tighten the shaft locking nuts (5).

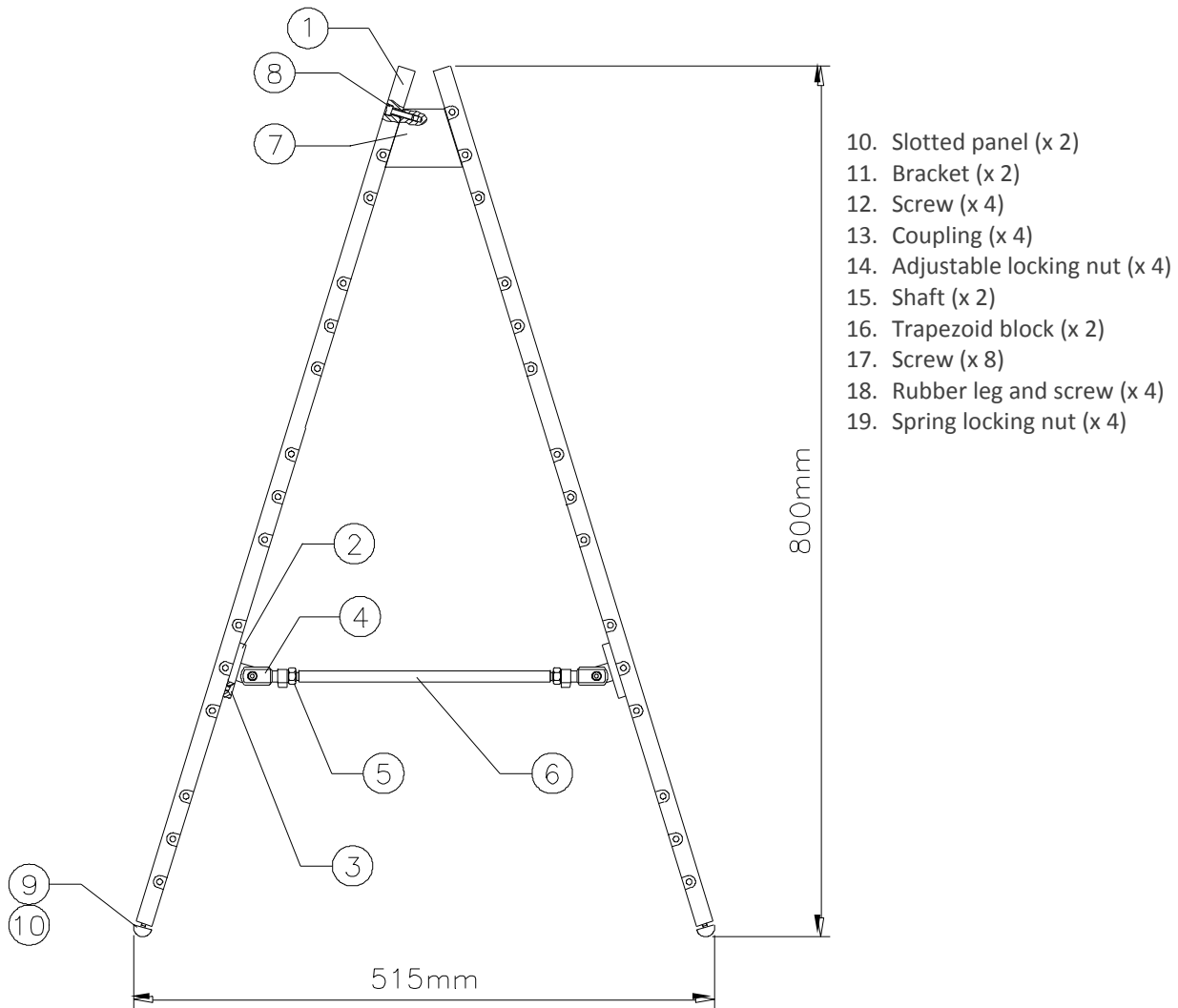


Figure 2: Double-Sided panel

1.2. ATTACHING COMPONENTS TO PANEL

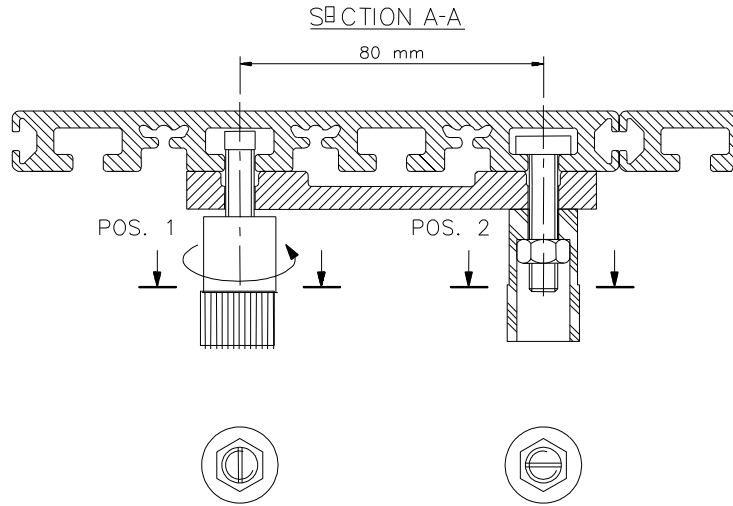
PneuFlex components are easily attached to the panel.

The pneumatic components are mounted on special plates which are attached to the panel. Do not remove the components from these plates.

The plates have either two or four pairs of bolts and nuts. The nuts are mounted in black plastic casings which allow them to be tightened and loosened by hand, without a tool. The heads of the bolts are shaped to fit into the slots of the panel.

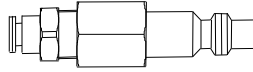
To attach a component to the panel, slide the bolt head into the slot, as shown in the SectionA-A diagram (Pos.1). When the component has been positioned as desired, turn the bolt casing clockwise to tighten the bolt and lock the component in place (Pos.2).

To remove a component from the panel, turn the bolt casing counter-clockwise to loosen the bolt.



1.3. CONNECTING COMPONENTS

Pneumatic components are connected by means of flexible $\varnothing 5\text{mm}$ hoses and push-in fittings (quick connectors).



- To connect an air hose to a push-in fitting, place the end of the hose into the female connector and firmly push it in.
- To disconnect components, push down on the ring and at the same time grasp and pull away the hose.

Since some components may be too far apart to connect with a single hoses, $\frac{1}{2}$ 5mm push-in connectors (shown here) are also supplied. These connectors are used to join two hoses and extend the length of hose between two components.

Make sure the pressure shut-off valve is shut before connecting or disconnecting a hoses.

1.4. CONNECTING THE AIR SUPPLY

PneuFlex components are designed to work in an industrial environment using standard pressure (6–7 bar). However, since the PneuFlex pistons are not loaded, an air pressure setting of 4 bar is recommended.

1. Attach the conditioning unit (Catalog #25310) to the PneuFlex panel. This unit is mounted on a plate with bolts which slide into the slots on the panel, like all other PneuFlex components.
2. Connect the conditioning unit shut-off valve to an available pressurized air supply outlet.
3. Connect the conditioning unit outlet to panel components. Manifolds and T-connectors can be used to distribute the air supply.

ⓘ Note: Do not connect PneuFlex components directly to the pressurized air supply.

ⓘ Note: Do not use the PneuFlex workbench without the conditioning unit component. Doing so may damage the PneuFlex components.

1.5. CONNECTING AN ELECTRO-PNEUMATIC SYSTEM (PLC MICROLOGIX)

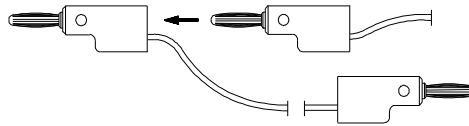
These instructions are for Electro-pneumatic systems only.

This section describes how to install the electro-hydraulic components for systems using PLC MicroLogix.

The Electro-PneuFlex unit requires a 24 Vdc/3A power supply unit to provide the electricity for the electro-pneumatic components.

Before you make any connections, make sure the voltage rating of the 24 Vdc Power Supply unit and the PLC MicroLogix matches your power supply.

All connections are by means of cables with stackable banana plugs. Refer to the diagrams below.



1.5.1. PneuFlex Wiring Connections (to Power Supply and PLC MicroLogix)

The PneuFlex wiring connections are performed by first connecting the power supply to the electrical distributor on the panel, and then connecting the PLC MicroLogix to the electrical distributor, as described in the procedures below.

The unused banana cables can be stored in the Wire Holder (refer to # 8, in **Error! Reference source not found.**). The 24VDC power supply should be connected to the PneuFlex panel and PLC MicroLogix.

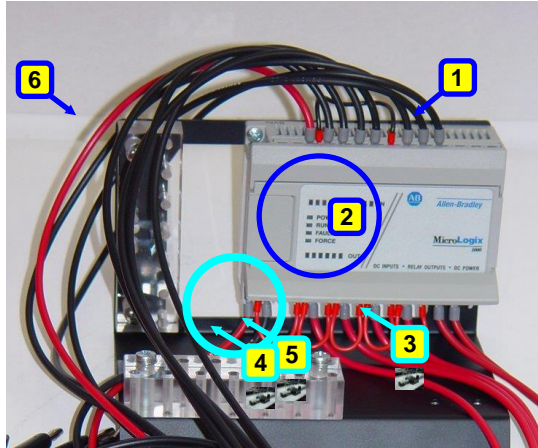
- Note:** The PLC MicroLogix cables are labeled, as follows: (+), (-), COM, #1-#8 (input cables) and #1-#6 (output cables). Refer to these labels when performing the electrical connections in this guide.

To connect the Power Supply to the Electrical Distributor (ED) on the PneuFlex Panel:

1. Connect the red power supply cable to a red socket on the Electrical Distributor.
2. Connect the black power supply cable to a black socket on the Electrical Distributor.

To connect the PLC MicroLogix to the Electrical Distributor (ED) on the PneuFlex Panel:

1. From the PLC MicroLogix, connect the black banana cable (#5, in figure 3), labeled as (-), to a black socket on the Electrical Distributor.
2. From the PLC MicroLogix, connect the red banana cable (#4, in figure 3), labeled as (+), to a red socket on the Electrical Distributor.
3. From the PLC MicroLogix, connect the red COM cable (#6, in figure 3), labeled as COM to a red socket on the Electrical Distributor.



1. 8 Digital Inputs with Banana Cables
2. Indication LEDs
3. 6 Relay Outputs with Banana Cables
4. Red Power Supply Cable (+)
5. Black Power Supply Cable(-)
6. Red COM Cable*
7. Communication Cable
8. Wire Holder

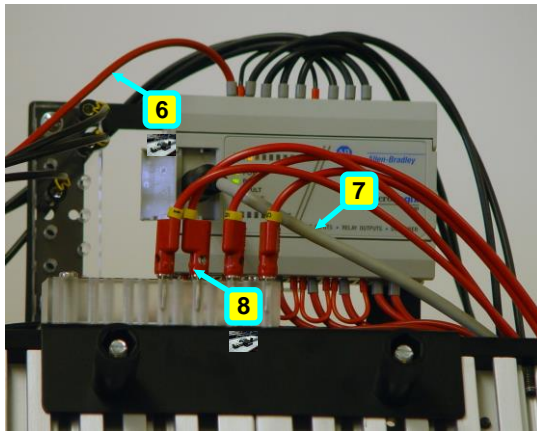


Figure 3: PLC MicroLogix Components

* **Note:** The MicroLogix inputs can be configured in one two ways:

- The input energizes when high-level voltage is applied to the input terminal (known as sinking or *active high*).
- The input energizes when low-level voltage is applied to the input terminal (known as sourcing or *active low*).
- In the first case scenario, the MicroLogix DC COM terminal must be connected to the VDC(-).
- In the second case scenario, the MicroLogix DC COM terminal must be connected to the VDC(+).

- In this tekLINK, you must connect the MicroLogix DC COM terminal to the VDC(+) and work in Active low mode.

1.5.1.1. 5/2 Sol-Sol Valve Connections

To connect the 5/2 sol-sol valve to the PLC MicroLogix and Power Supply:

1. Connect the one end of a black banana cable to a black socket on the Electrical Distributor (-) and connect the other end of the black banana cable to the black socket on the 5/2 sol-sol valve.
2. From the PLC MicroLogix, connect an output cable (#1 for example) to the right red socket of the 5/2 sol-sol valve.
3. From the PLC MicroLogix, connect an output cable (#2 for example) to the left red socket of the 5/2 sol-sol valve.

1.5.1.2. Proximity Sensor Connections

To connect the proximity sensors to the PLC MicroLogix and Power Supply:

1. Connect the one end of a black banana cable to a black socket on the Electrical Distributor (-) and connect the other end of the black banana cable to the black socket on the (b0) proximity sensor.
2. Connect the one end of a red banana cable to a red socket on the Electrical Distributor (+) and connect the other end of the red banana cable to the red socket on the (b0) proximity sensor.
3. Connect the one end of a black banana cable to a black socket on the Electrical Distributor (-) and connect the other end of the black banana cable to the black socket on the (b1) proximity sensor.
4. Connect the one end of a red banana cable to a red socket on the Electrical Distributor (+) and connect the other end of the red banana cable to the red socket on the (b1) proximity sensor.

5. Connect the PLC MicroLogix to the proximity sensors (b0 and b1), as follows:

- Connect an input cable (#3 for example) to the gray socket of the left proximity sensor (b0).
- Connect an input cable (#4 for example) to the gray socket of the right proximity sensor (b1).

1.5.1.3. Installing and Connecting Magnetic Sensors

Refer to the diagram below.

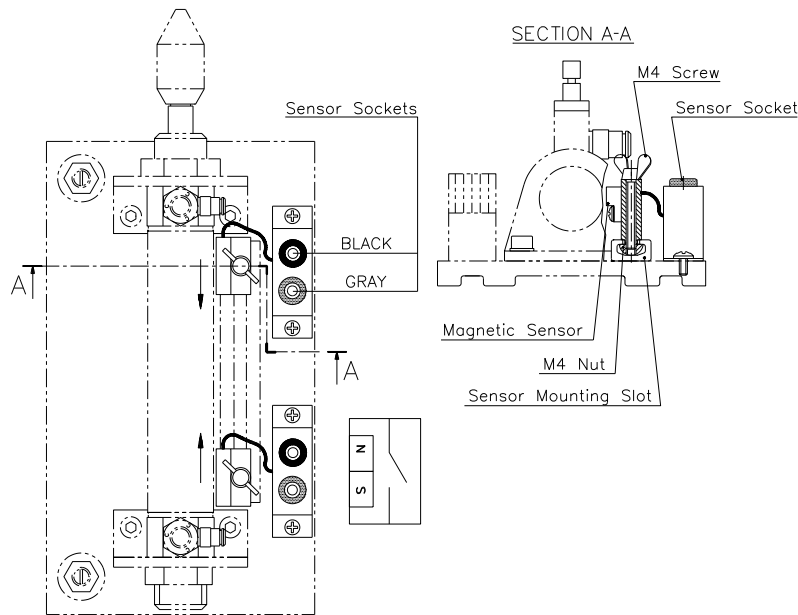


Figure 4: Magnetic Sensor Connections

1. Insert the M4 nut into the sensor slot alongside the cylinder.
2. Fit the bracket cover onto the sensor socket bracket.
3. Using 2 Phillips screws, attach the sensor socket bracket to the cylinder's mounting plate.
4. Fit the M4 screw through the bore in the sensor housing, and attach it to the M4 nut in the sensor slot. Position the sensor as desired, and tighten the screw.
5. Repeat Steps 1 through 4 for a second sensor, if desired.

Connecting the two magnetic sensors to the PLC MicroLogix and Power Supply:

1. Connect the one end of a black banana cable to a black socket on the Electrical Distributor (-) and connect the other end of the black banana cable to the grey socket of the (a0) sensor.
2. From the PLC MicroLogix, connect an input cable (#1 for example) to the right black socket of the (a0) sensor.
3. From the PLC MicroLogix, connect an input cable (#2 for example) to the left black socket of the (a1) sensor.
4. Using a black banana cable connect the (a0) sensor's grey socket to the (a1) sensor's grey socket.

1.6. CONNECTING AN ELECTRO-PNEUMATIC SYSTEM (CP/C 2000A)

These instructions are for Electro-pneumatic systems only.

The Electro-PneuFlex unit requires a 24 Vdc/3A power supply unit to provide the electricity for the electro-pneumatic components.

Before you make any connections, make sure the voltage rating of the 24 Vdc Power Supply unit and the CP/C2000A matches your power supply.

All connections are by means of cables with stackable banana plugs. Refer to the diagram shown on page 5.

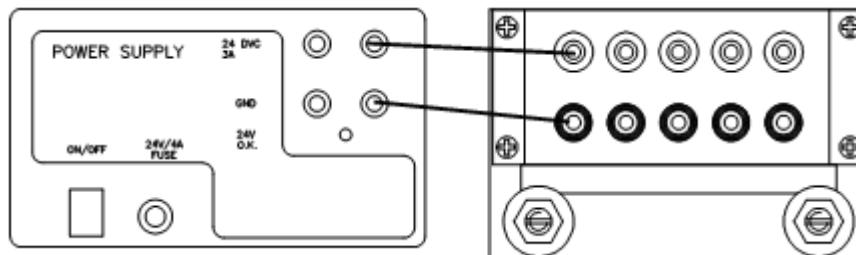
1.6.1. PneuFlex Wiring Connections (to Power Supply and CP/C 2000A)

The following connections are required for all electro-pneumatic components.

1. Connect the 24 Vdc power supply unit to a grounded AC power supply outlet.
2. Connect the CP/C2000A to a grounded AC power supply outlet.
3. Connect the 24 Vdc Power Supply unit's 24 Vdc outlet (+) to the COM OUT socket of the CP/C2000A.

1.6.1.1. Electrical Distributor Connections

Connect the electrical distributor (Cat.#10024, shown at right) to the power supply unit, as shown in the example below.



1.6.1.2. 5/2 Sol-Sol Valve Connections

1. Connect the middle (black) socket of the 5/2 sol-sol valve to the 24 Vdc Power Supply unit's GND (-).
2. Connect the two outer (red) sockets of the 5/2 sol-sol valve to two available output sockets on the CP/C2000A.

1.6.1.3. Proximity Sensor Connections

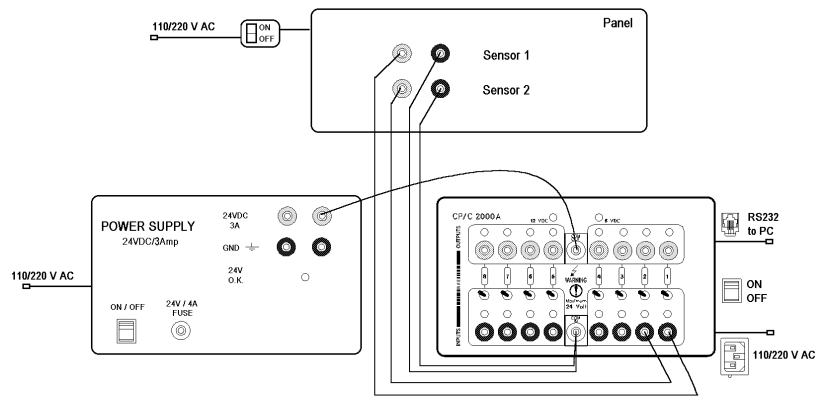
1. Connect the 24 Vdc Power Supply unit's GND (-) socket to the COMIN socket of the CP/C2000A.
2. Connect the black socket of the proximity sensor to the 24 Vdc Power Supply unit's GND (-). (The banana plugs can be inserted one into another and then into the GND socket.)
3. Connect the red socket of the proximity sensor to the 24 Vdc Power Supply unit's 24 Vdc outlet (+).
4. Connect the gray socket of the proximity sensor to an available input socket on the CP/C2000A.

1.6.1.4. Magnetic Sensor Connections

For additional details on connecting the magnetic sensors, refer to the diagram on page 8.

1. Insert the M4 nut into the sensor slot alongside the cylinder.
2. Fit the bracket cover onto the sensor socket bracket.
3. Using 2 Phillips screws, attach the sensor socket bracket to the cylinder's mounting plate.
4. Fit the M4 screw through the bore in the sensor housing, and attach it to the M4 nut in the sensor slot. Position the sensor as desired, and tighten the screw.
5. Repeat Steps 1 through 4 for a second sensor, if desired.

Refer to the diagram below.



1. Connect the 24 Vdc power supply unit to a grounded AC power supply outlet.
2. Connect the CP/C2000A to a grounded AC power supply outlet.
3. Connect the 24 Vdc Power Supply unit's 24 Vdc outlet (+) to the COM OUT socket of the CP/C2000A.
4. Using the banana cables, connect both black (or both gray) sockets of the magnetic sensors to the COM IN socket of the CP/C2000A or PLC. (The banana plugs are stackable they can be inserted one into another and then into the socket.)
5. Connect both gray (or both black) sockets of the magnetic sensors to two available input sockets on the CP/C2000A.

2. Safety and Maintenance

2.1. SAFETY

For your personal safety, make sure you observe the following safety guidelines:

- Always wear safety glasses and protective clothing when working with the PneuFlex system.
- Before activating the system, make sure the bolts which attach components to the panel are securely fastened.
- Make sure the pressure shut-off valve is shut before connecting or disconnecting a hose or coupler.

2.2. MAINTENANCE

The PneuFlex requires little or no maintenance. However, to ensure safe and proper operation, make sure you comply with the following:

- Check hoses regularly for twisting, cracking, splitting or leakage. Replace any hose which shows signs of damage.
- The lubrication unit of the conditioning unit should be filled with light oil. Do not exceed the level indicated on the lubrication unit's gauge.
- The cap of the condensation trap on the conditioning unit should be periodically removed to drain any water which has accumulated. Press the valve at the bottom of the cap to release the water.

3. Components

3.1. TERMINOLOGY

The following are definitions of terms used in this manual as they relate to pneumatics and the PneuFlex training unit.

Controller	An element which controls a particular function of a device. A controller can be pneumatic, pneumatic, electric or mechanical, and may be operated manually or by a control signal.
Cylinder	A cylindrical chamber in which a piston moves.
Piston	A disk or round part which fits tightly and moves within a cylinder.
Port	Openings in pneumatic components which enable air to flow through them. The following codes are generally used to identify ports: R, S: Exhaust lines, outlets; port is usually fitted with a silencer. P: Pressure. Compressed air input. A, B: Supply lines; enable control of device(s), such as cylinders. Y, Z: Control lines; enable control of the the valve position.
Position	A defined status of a component or valve.
Pressure	The ratio of a force to the area on which the force is exerted. Pressure is measured in bar or Pascal units.
Solenoid	An electric conductor wound in such a way that a magnetic field is created when electric current flows through the windings. Solenoids can therefore be used for electric control of pneumatic valves. Solenoid is often abbreviated as sol.
Silencers	An element which reduces the noise caused by air being exhausted from pneumatic components.

3.2. PNEUFLEX HARDWARE PACKAGES

Illustrations and descriptions of the PneuFlex components appear on the following pages. Items which are not designated as belonging to the Basic, Advanced or Electro-PneuFlex packages are optional components which can be purchased separately for use with PneuFlex.

Table 1: Catalog #1904: Basic Pneumatics - Package P1

Qty	Catalog #	Part Name (Alternate Name)
1	25320	Slotted Panel, one-sided
1	25310	Conditioning Unit
1	25301	5/2 Double Air Pilot Valve (5/2 Air-Air Control Valve)
2	25302	3/2 Mushroom Push Button (3/2 Push Button Valve)
1	25303	3/2 Lever Valve (3/2 Manually Operated Valve, Toggle Valve)
1	25304	3/2 Double Roller Lever Valve (3/2 Roller Valve)
1	25305	3/2 Pneumatic Valve (3/2 Air-Spring Control Valve)
1	25309	AND Gate
1	25307	OR Gate
1	25308	NOT Gate
1	25311	Double-Acting Cylinder
1	25306	Manifold
4	324059	T-Connector
4	324060	Connector
1	25321	Quick-Coupler
	324414 324415 324416	Tubing

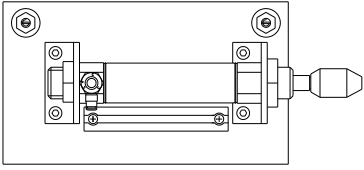
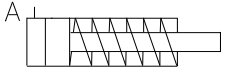
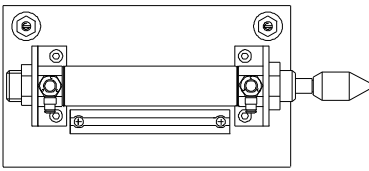
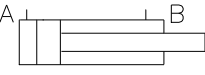
Table 2: Catalog #1905: Advanced Pneumatics: Package P2

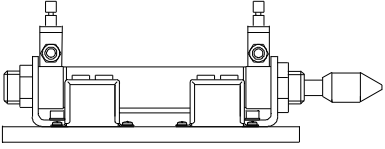
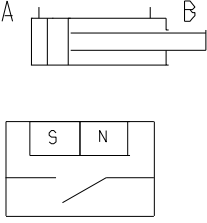
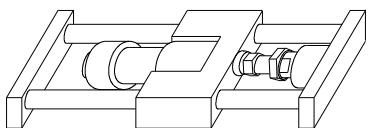
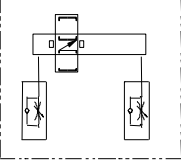
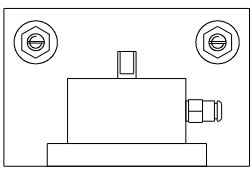
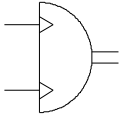
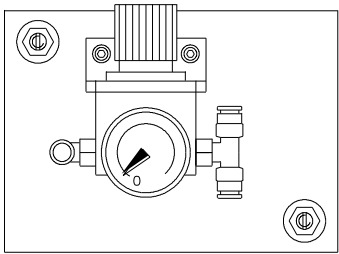
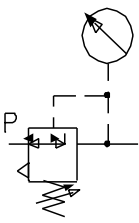
Qty	Catalog #	Part Name (Alternate Name)
1	25311	Double-Acting Cylinder
2	25301	5/2 Double Air Pilot Valve (5/2 Air-Air Control Valve)
2	25312	Single Air Pilot Valve
1	25304	3/2 Double Roller Lever Valve (3/2 Roller Valve)
1	25313	Pneumatic Time Delay Valve
1	25306	Manifold

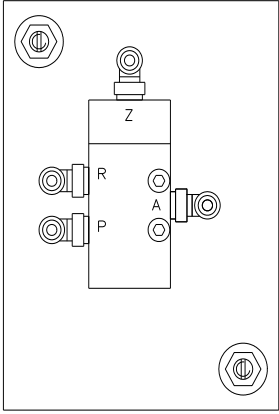
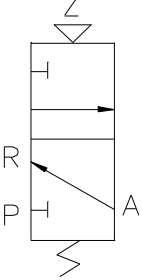
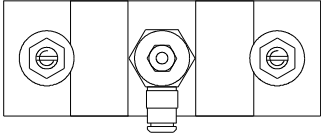

Table 3: Catalog #1906: Electro-Pneumatics: Package P3

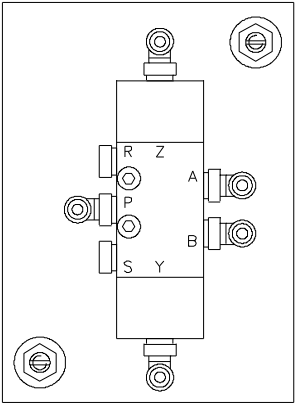
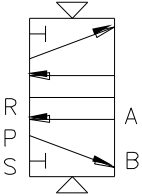
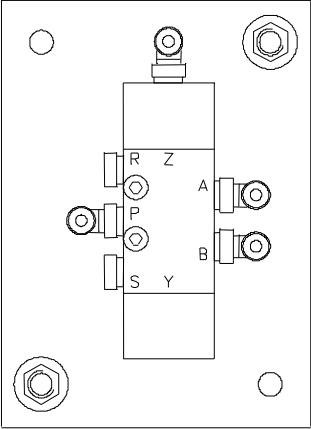
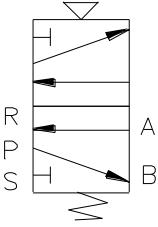
Qty	Catalog #	Part Name (Alternate Name)
2	25314	5/2 Double Solenoid Valve (5/2 Sol-Sol Control Valve)
3	25322	Inductive Proximity Sensor
1	25323	Magnetic Sensors
14 total:		Banana Plug Cables:
3	411649	Red 24" (610mm)
3	411650	Black 24" (610mm)
1	411651	Gray 24" (610mm)
3	411652	Red 48" (1220mm)
3	411653	Black 48" (1220mm)
1	411654	Gray 48" (1220mm)
1	10024	Electric Distributor

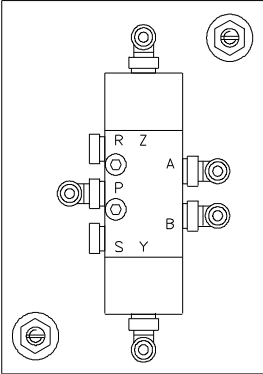
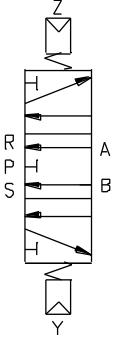
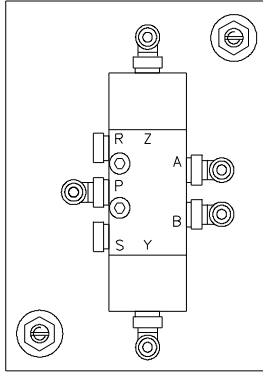
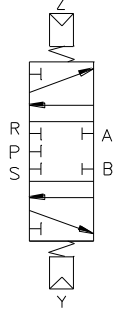
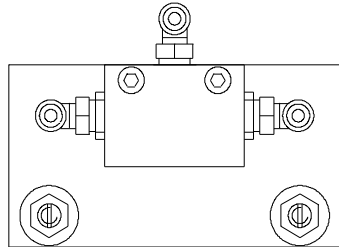
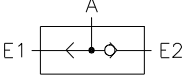
3.3. PNEUFLEX COMPONENTS

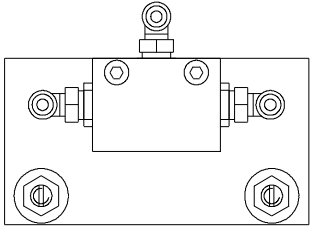
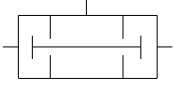
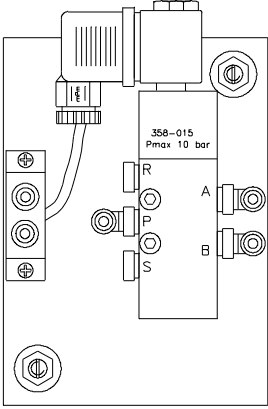
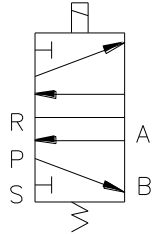
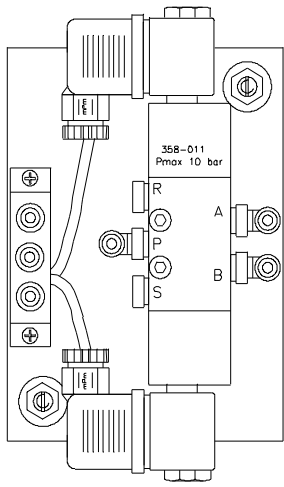
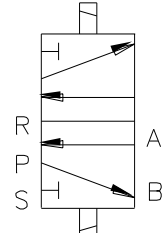
Cat #	Name	Schematic	Description
Cylinders, Drives, Actuators			
25325	Single-Acting Cylinder 		Single-acting cylinder Pneumatically actuated, spring return Cam and magnetic piston With one-way flow control valve Piston diameter: 25 mm Stroke: 50 mm
25311 BASIC	Double-Acting Cylinder 		Double-acting cylinder Cam and magnetic piston Ports fitted with 2 one-way flow control valves: forward valve regulates piston extension speed; rear valve regulates piston retraction speed Adjustable knob with locking nut Piston diameter: 25 mm Stroke: 80 mm With one-way flow control valve

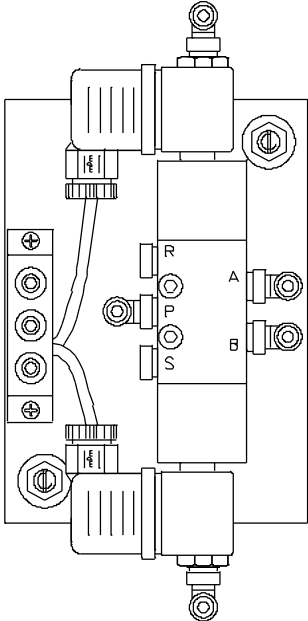
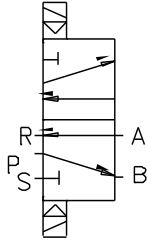
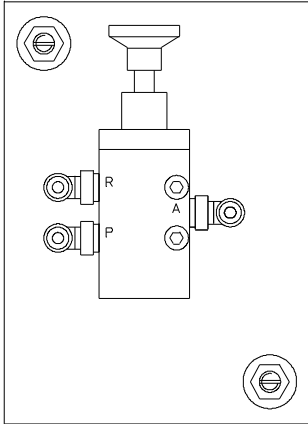
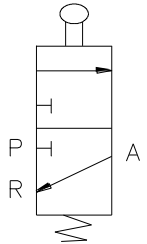
Cat #	Name	Schematic	Description
25316	Double-Acting Cylinder with Magnetic Sensors 		Double-acting cylinder With 2 one-way flow control valves Cam and magnetic piston Piston diameter: 25 mm Stroke: 80 mm One-way flow control valve With pair of magnetically activated proximity sensors Operating voltage: 12-24 Vdc, 0.5 A
25348	Pneumatic Linear Drive 		Double-acting cylinder Stroke: 200 mm Pressure range: 2-8 bar
25362	Pneumatic Semi-Rotary Drive 		Pneumatic motor Pneumatic cylinder with rotary drive Limited range
Pneumatically and Electrically Activated Valves			
25338	Pressure Control Valve with Gauge 		Service unit: pressure regulator valve and pressure gauge Input pressure max.: 16 bar Pressure range: 0-12 bar

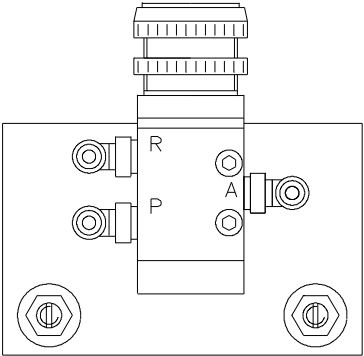
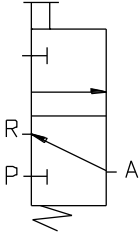
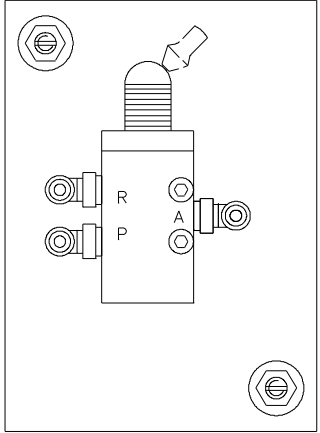
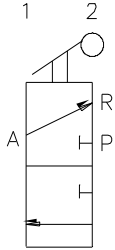
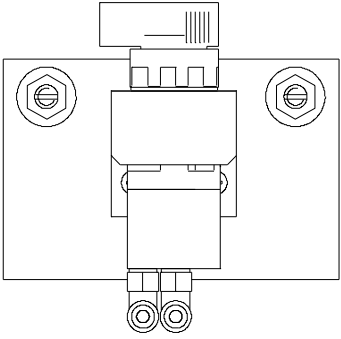
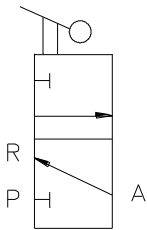
Cat #	Name	Schematic	Description
<p>25305</p> <p>BASIC</p>	<p>3/2 Pneumatic Valve</p>  <p>(3/2 Air-Spring Control Valve)</p>		<p>3/2 directional control valve Pneumatically actuated, spring return Pressure range: 0-8 bar</p> <p>Example of Use When no pressure is applied to port Z, the valve's position is determined by the spring. In this position port P is blocked and ports A and R are connected, hence there is no pressure at A. When pressure is applied to Z, the valve's position switches and established air flow from P to A. Exhausting the pressure from port Z allows the spring to return the valve to its initial position.</p>
<p>25312</p> <p>ADVANCED</p>	<p>2/2 Single Air Pilot Valve</p> 		<p>2/2 pulse valve Pneumatically actuated, one side Pressure range: 2-10 bar</p> <p>This valve converts a continuous pneumatic control signal into a short pulse. The duration of the pulse can be adjusted by means of a screw on the bottom of the valve. This valve can be used to operate valves with low switching forces, and can prevent pressure from being applied simultaneously to both control ports (Y, Z) of a control valve.</p> <p>Example of Use When pressure is applied to the IN port, pressure is briefly applied to the OUT port. After the IN port pressure is exhausted, the valve is reset. If pressure is again applied to the IN port, pressure will again be applied briefly to the OUT port.</p>

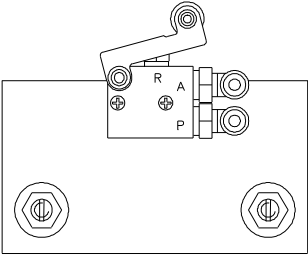
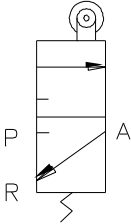
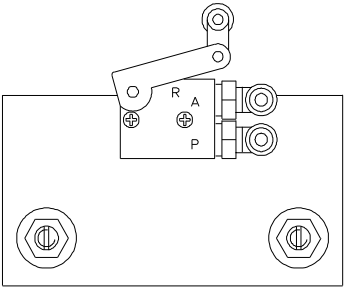
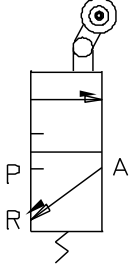
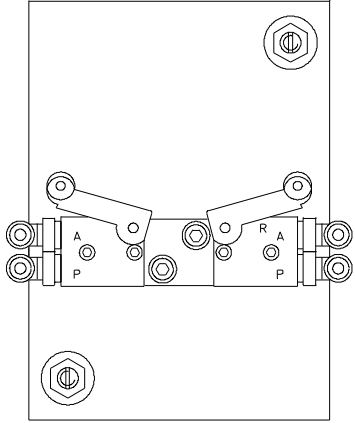
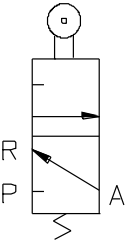
Cat #	Name	Schematic	Description
<p>25301</p> <p>BASIC</p>	<p>5/2 Double Air Pilot Valve</p>  <p>(5/2 Air-Air Control Valve)</p>		<p>5/2 directional control valve Pneumatically actuated, both sides Directly activated Pressure range: 0-8 bar</p> <p>The valve is controlled by signals which apply pressure to either port Y or port Z. Applying pressure to both control ports will have no effect on the valve position. The valve has no normal state; the position of the valve is determined by the last control signal received and remains unchanged until another signal is received. This valve can be used to control a double-acting cylinder.</p> <p>Example of Use When pressure is applied to Y, air from port P is directed to port B, and air from port A is exhausted through port R. When pressure is applied to Z, air from port P is directed to port A, and air from port B is exhausted through port S. Applying pressure to Y will return the valve to the first position.</p>
<p>25324</p>	<p>5/2 Pneumatic Valve</p> 		<p>5/2 directional control valve Pneumatically actuated, spring return Bi-stable Pressure range: 0-8 bar</p>

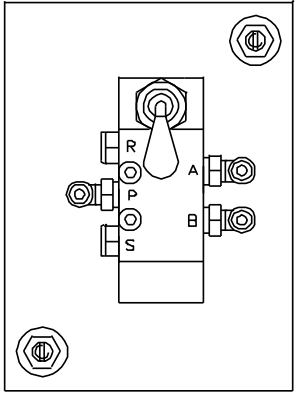
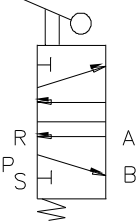
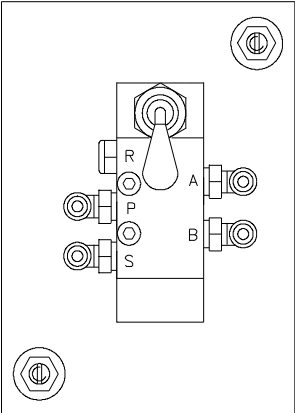
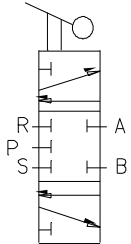
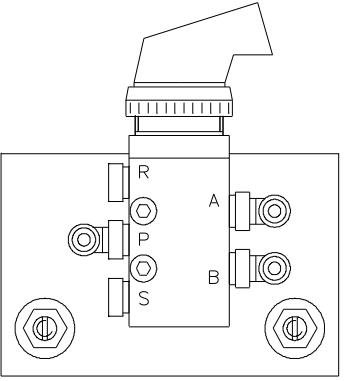
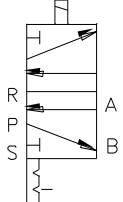
Cat #	Name	Schematic	Description
25327	5/3 Pneumatic Valve, Open Center 		5/3 directional control valve Pneumatically actuated, both sides Indirectly activated Open center Pressure range: 2-10 bar
25328	5/3 Pneumatic Valve, Closed Center 		5/3 directional control valve Pneumatically actuated, both sides Indirectly activated Closed center Pressure range: 2-10 bar
25339	Shuttle Valve 		Non-return valve OR gate Pressure range: 1-10 bar

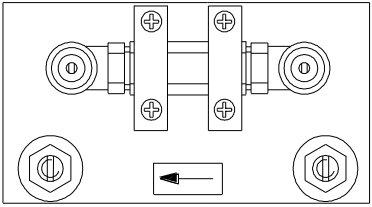
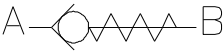
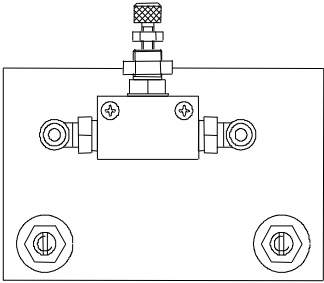
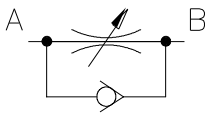
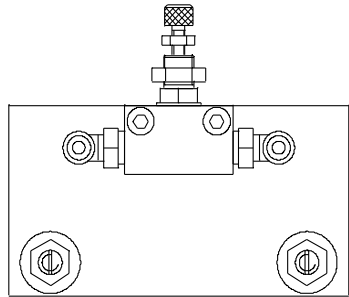

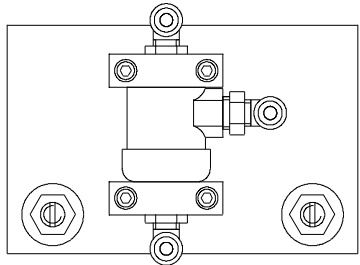
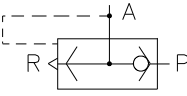
Cat #	Name	Schematic	Description
25340	<p>Dual Pressure Valve</p> 		<p>Non-return valve AND gate Pressure range: 1-10 bar</p>
25315	<p>5/2 Solenoid Valve</p>  <p>(5/2 Sol-Spring Control Valve)</p>		<p>5/2 directional control valve Solenoid actuated, spring return LED indicator Pressure range: 0-10 bar Operating voltage: 24 Vdc</p>
25314 ELECTRO	<p>5/2 Double Solenoid Valve</p>  <p>(5/2 Sol-Sol Control Valve)</p>		<p>5/2 directional control valve Solenoid actuated, both sides LED indicators Pressure range: 0-10 bar Operating voltage: 24 Vdc</p> <p>Make sure power is connected to only one solenoid at a time.</p> <p>Example of Use The valve position is determined by the last control signal. In one position, air from port P is directed to port B while air from port A is exhausted through port R. Energizing the proper solenoid changes the valve position, thus redirecting air from port P to port A and exhausting air from port B through port R. Energizing the other solenoid returns the valve to its initial position.</p>

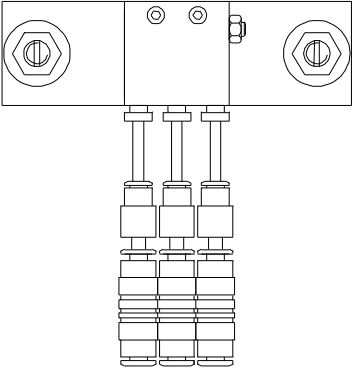
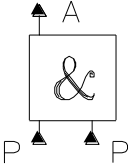
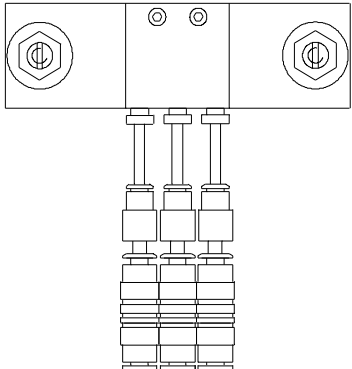
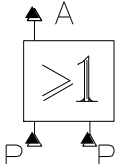
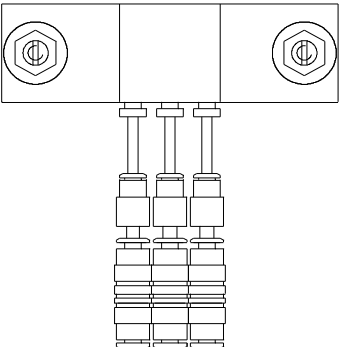
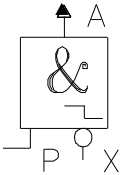
Cat #	Name	Schematic	Description
25379	5/2 Double Solenoid/Air Pilot Valve 		5/2 directional control valve 2 air pilots, each solenoid actuated Actuated both sides LED indicators Pressure range: 0-10 bar Operating voltage: 24 Vdc
Manually and Mechanically Activated Valves			
25302 BASIC	3/2 Mushroom Push Button Valve  (3/2 Push Button Valve)		3/2 directional control valve Push button actuated, spring return Pressure range: 0-8 bar This valve can be used to control air flow to a cylinder. Example of Use In its normal state, the valve blocks port P and connects ports A and R. When the push button is pressed, it compresses the spring and establishes air flow from port P to port A. When the push button is released, the spring expands, and allows the valve to return to its initial position.

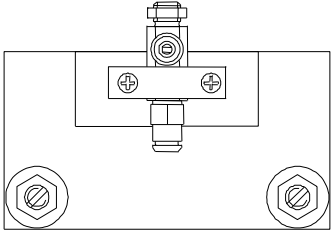
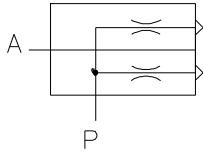
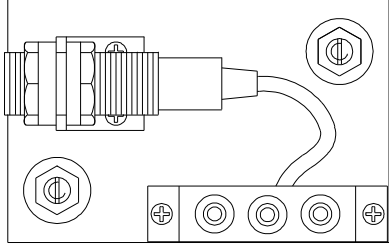
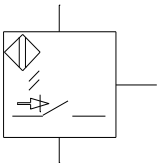
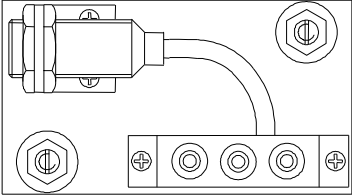
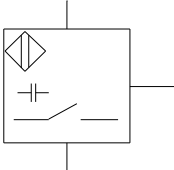
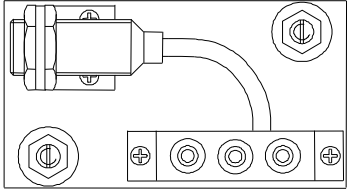
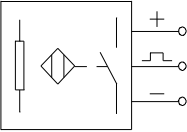
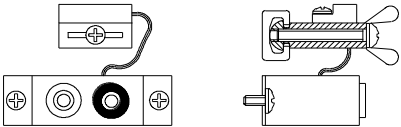
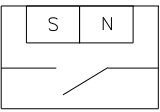
Cat #	Name	Schematic	Description
25329	3/2 Flat Push Button Valve 		3/2 directional control valve Push button actuated, spring return Pressure range: 2-10 bar
25303 BASIC	3/2 Lever Valve  (3/2 Manually Operated Valve)		3/2 directional control valve Manual level actuated, manual return Normally closed Pressure range: 0-8 bar Example of Use Position 1 establishes air flow. Position 2 terminates the air flow. When the lever is switched to position 1, the valve allows air to flow from port P to port A. When the lever is switched to position 2, an internal piston moves and blocks the air flow from ports P to A. Air from port A is exhausted through port R.
25331	3/2 Selector Valve 		3/2 directional control valve Manual switch actuated, manual return. Pressure range: 2-10 bar

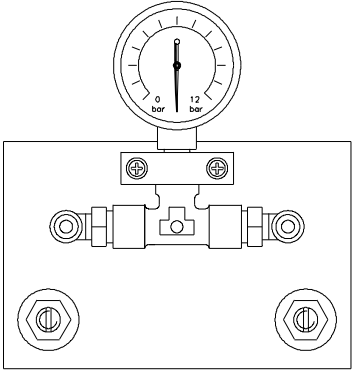
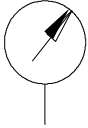
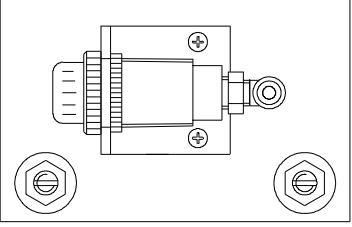
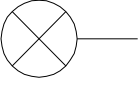
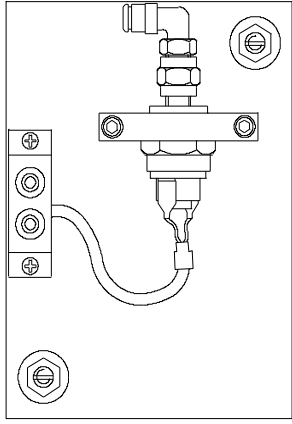
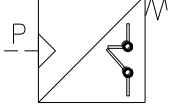
Cat #	Name	Schematic	Description
25367	3/2 Roller Lever Valve 		3/2 directional control valve Roller lever actuated, spring return Pressure range: 0-8 bar
25337	3/2 Roller Lever Valve with Free Return 		3/2 directional control valve Roller lever actuated, free return Normally closed Pressure range: 0-8 bar
25304 BASIC	Double 3/2 Roller Lever Valve  (3/2 Roller Valve)		Two 3/2 directional control valves Roller lever actuated, spring return Normally closed Pressure range: 0-8 bar This component serves as a limit switch for the outgoing and ingoing strokes of a cylinder: one valve is activated when the head of the piston rod is fully extended and the other valve is activated when the piston is fully retracted. Although it is a 3/2 valve, only ports P and A are accessible to the user since the exhaust port, R, is within the cylinder's working area. When attaching this component to the panel, make sure the cam at the end of the piston rod presses each valve completely.

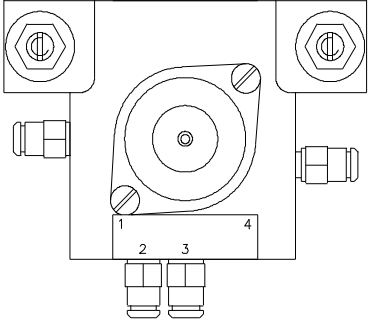
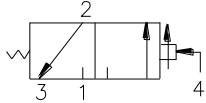
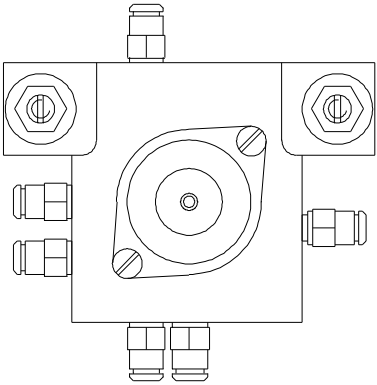
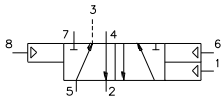
Cat #	Name	Schematic	Description
25365	5/2 Lever Valve 		5/2 directional control valve Manual level actuated, spring return Pressure range: 0-10 bar
25363	5/3 Lever Valve, Closed Center 		5/3 directional control valve Manual level actuated, manual return Closed center Pressure range: 0-10 bar
25326	5/3 Selector Valve 		5/3 directional control valve Manual switch actuated Operating position retained upon actuation Pressure range: 2-10 bar
Flow, Non-Return and Regulating Valve			

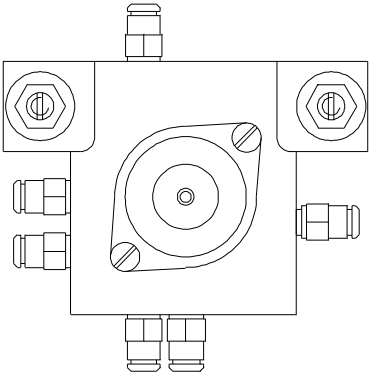
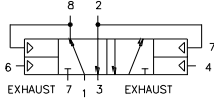
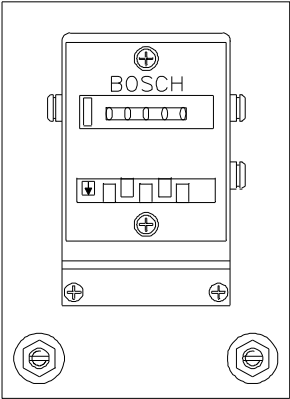
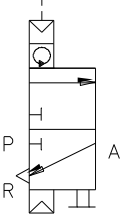
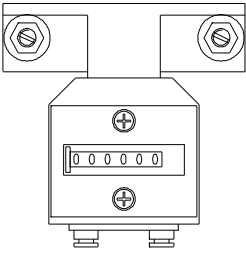
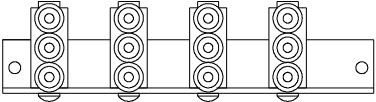
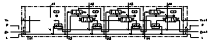
Cat #	Name	Schematic	Description
25344	Non-Return Check Valve 		Non-return check valve Pressure range: 0.3-10 bar
25332	One-Way Flow Control Valve 		One-way flow control valve Adjustable Pressure range: 1-8 bar
25333	Two-Way Flow Control Valve 		Two-way flow control valve Adjustable Pressure range: 1-8 bar
25334	Quick Exhaust Valve 		Quick exhaust valve Pressure range: 0.5-8 bar
Logic Elements			

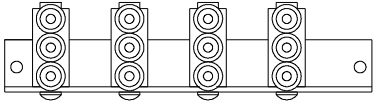
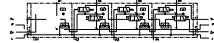
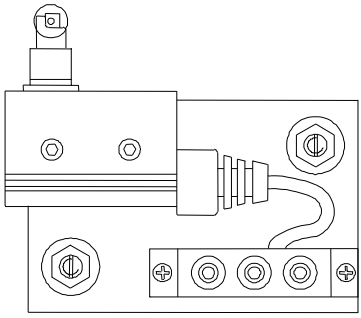
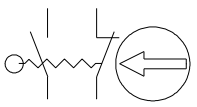
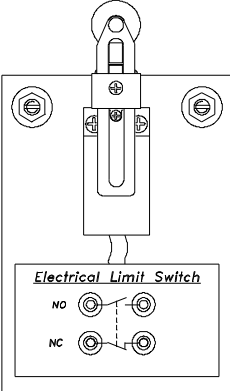
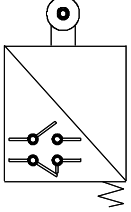
Cat #	Name	Schematic	Description
<p>25309</p> <p>BASIC</p>	<p>And Gate Valve</p> 		<p>AND gate (logic unit) Pressure range: 2-8 bar</p>
<p>25307</p> <p>BASIC</p>	<p>Or Gate Valve</p> 		<p>OR gate (logic unit) Pressure range: 2-8 bar</p>
<p>25308</p> <p>BASIC</p>	<p>Not Gate Valve</p> 		<p><i>NOT gate (logic unit)</i> <i>Pressure range: 2-8 bar</i></p> <p>Since there can be no pressure at the output if no pressure is applied to the input, the NOT gate operates according to the logic function AND NOT (e.g., when pressure is applied to port X AND NOT applied to port P there will also be pressure at port A.)</p>
<p>Sensors</p>			

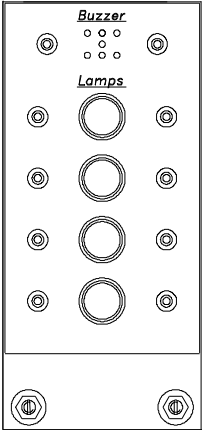
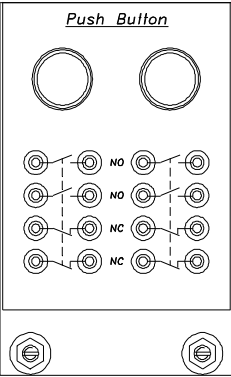
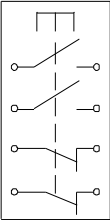
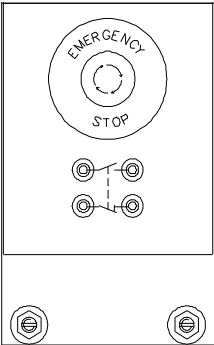
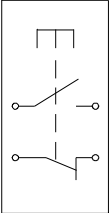
Cat #	Name	Schematic	Description
25343	Pneumatic Proximity Sensor 		Pneumatic proximity switch Pressure range: 2-10 bar
25318	Optical Proximity Sensor 		Optical proximity switch LED indicator Switching distance: 10 mm Operating voltage: 24 Vdc
25319	Capacitive Proximity Sensor 		Capacitive proximity switch LED indicator Switching distance: 10 mm Operating voltage: 24 Vdc
25322 ELECTRO	Inductive Proximity Sensor 		Inductive proximity switch LED indicator Switching distance: 10 mm Operating voltage: 24 Vdc
25323 ELECTRO	Magnetic Proximity Sensors 		Magnetic proximity switch 2 magnetic sensors For attaching to cylinders Operating voltage: 12-24 Vdc, 0.5 A

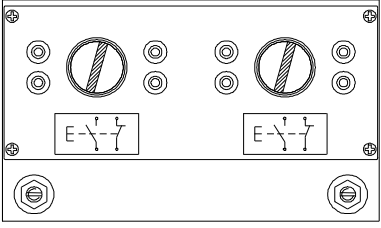
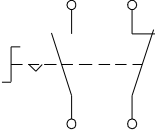
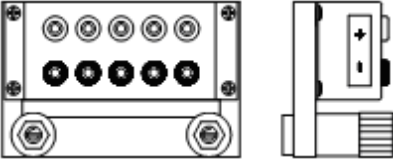
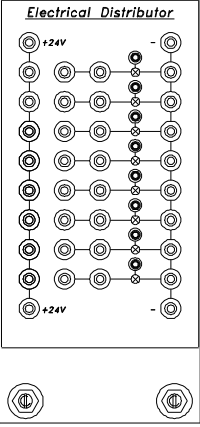
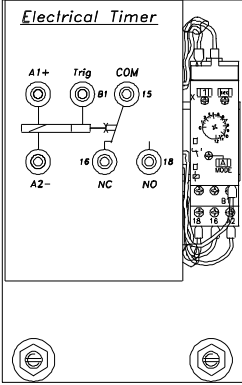
Cat #	Name	Schematic	Description
25335	Pressure Gauge 		Pneumatic pressure gauge Range: 0-12 bar
25336	Optical Pressure Indicator 		Optical pneumatic pressure indicator Pressure range: 0-8 bar
25353	Pneumatic Pressure Switch 		Pneumatic pressure switch Normally closed Changeover contact Operating voltage: 24 Vdc, 5 A Pressure range: 0-10 bar
Control Units			

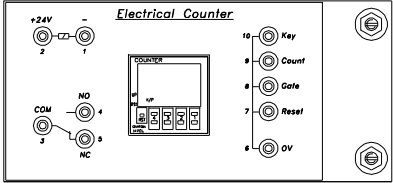
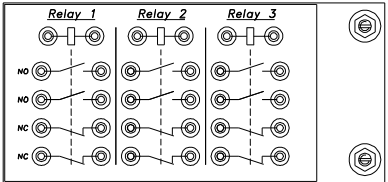
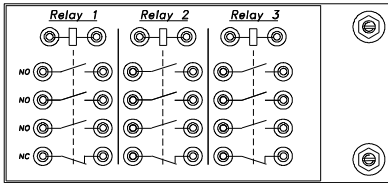
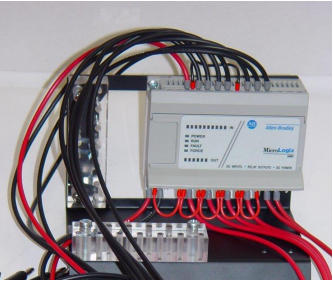
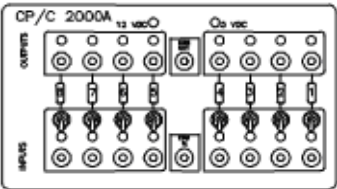
Cat #	Name	Schematic	Description
<p>25313</p> <p>ADVANCED</p>	<p>Pneumatic Time Delay Valve</p> 		<p>3/2 valve Spring return Adjustable time delay: 0-30 sec Pressure range: 0-8 bar</p> <p>Example of Use Port 1 is the pressure input. Port 2 is the delayed output. Port 3 is the exhaust port. Port 4 is the control signal input. In the normal position, pressure is applied to P and no pressure is applied to A and Z. When pressure is applied to Z, compressed air flows through the restriction into the capacitor and also through the control line to the 3/2 valve. Pressure from the other side acts against the pressure in the control line, thus blocking the flow from P to A. As air continues to be supplied, pressure builds up behind the restriction. If the force produced by the pressure exceeds the spring force, the 3/2 valve switches over, and thus establishes flow from P to A. The delay is the time it takes for the valve to switch over after pressure has been applied at Z. When pressure is no longer applied to Z, the compressed air escapes from the capacitor. The 3/2 valve returns to its normal position. Line A is exhausted through R.</p>
<p>25347</p>	<p>Pneumatic Sequence Valve</p> 		<p>4/2 double-piloted valve Pressure range: 0-8 bar</p>

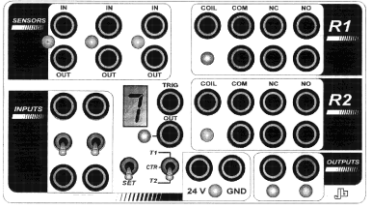
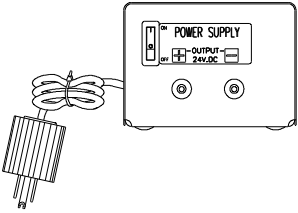
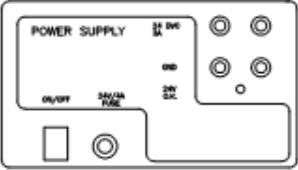
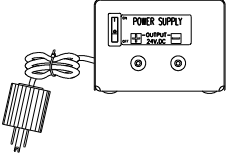
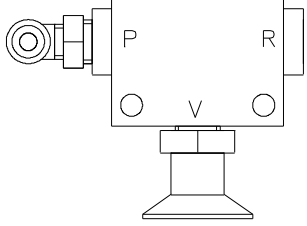
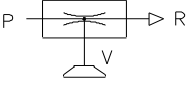
Cat #	Name	Schematic	Description
25364	Binary Trigger Valve 		<p>Special purpose valve Double-piloted Works in conjunction with other valves to provide single input flip-flop Pressure range: 0-8 bar</p>
25346	Pneumatic Counter 		<p>Pneumatic preset counter with automatic reset 5 digit display Pressure range: 2-8 bar</p>
25345	Pneumatic Totalizing Counter 		<p>Pneumatic counter 5 digit display Pressure range: 2-8 bar</p>
25349	Stepper Module 		<p>Valve with integrated AND and OR gates Pressure range: 2-8 bar</p>

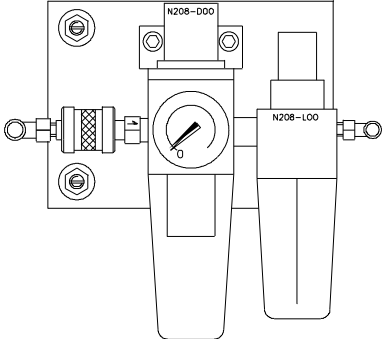
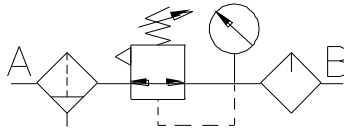
Cat #	Name	Schematic	Description
25350	Expansion Stepper Module 		Valve with integrated AND and OR gates Pressure range: 2-8 bar
25317	Electrical Limit Switch with Roller Lever 		Electrical limit switch Roller actuated Changeover contact Switching distance: 10 mm Operating voltage: 24 Vdc
25352	Electrical Limit Switch, with Adjustable Roller Lever 		Electrical position switch Roller actuated, spring return Banana jacks: 1 NO, 1 NC Operating voltage: 24 Vdc


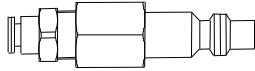
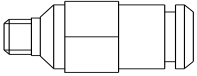
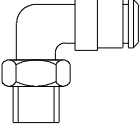
Cat #	Name	Schematic	Description
25354	Buzzer & Lamp Unit 		1 buzzer and 4 lamps Banana jacks (per input): V+, V- Operating voltage: 24 Vdc, 1A Lamp power: 1.2 W max. each Buzzer power: 0.8 W Frequency: 400 Hz
25355 25376	Electrical Push Button On/Off Switches 		2 electrical push button switches: #25355: Green buttons #25376: Red buttons Banana jacks (per switch): 2 NO, 2 NC Operating voltage: 24 Vdc, 5 A
25356	Electrical Emergency Stop Button 		Electrical push button switch, turn unlock Banana jacks: 1 NO, 1 NC Operating voltage: 24 Vdc, 5 A

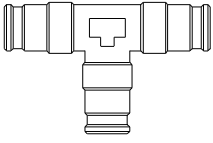
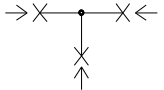
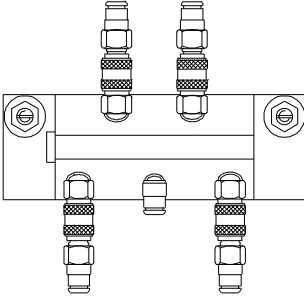
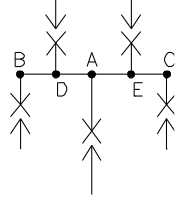
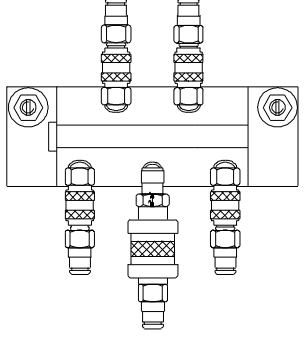
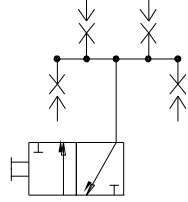
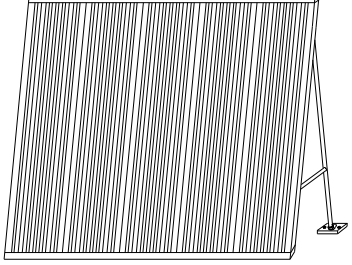
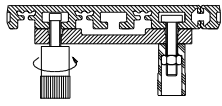
Cat #	Name	Schematic	Description
25358	Electrical Selector Switches 		2 electrical selector switches Banana jacks: 2 NO, 2NC Operating voltage: 24 Vdc, 5 A
10024 ELECTRO	Electrical Distributor, 5 jacks 		Electrical distributor Banana jacks: 5 V+, 5 V- Operating voltage: 24 Vdc, 5 A
25357	Electrical Distributor, 8 jacks 		Electrical distributor Operating voltage: 24 Vdc, 5 A Banana jacks: 8 V+, 8 V- 16 connectors LED indicators
25360	Electrical Timer Relay 		Electrical timer relay Eight operating modes: A: On delay B: Flicker Off start B2: Flicker On start C: Signal On/Off delay D: Signal Off delay E: Interval G: Signal On/Off delay J: One-shot Banana jacks: 1 COM, 1 NO, 1 NC, 1 trigger; V+, V- Operating voltage: 24 Vdc, 5 A

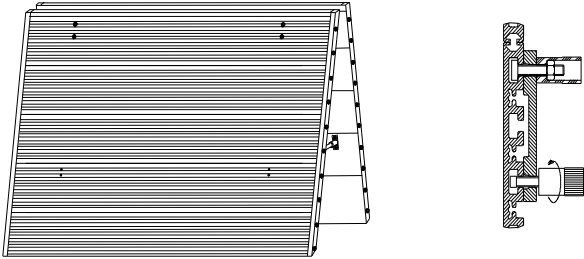
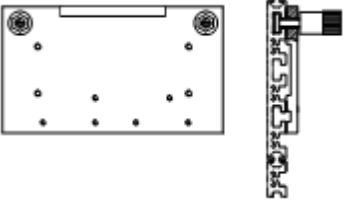
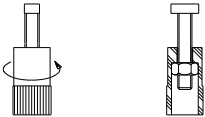

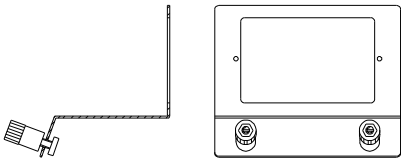
Cat #	Name	Schematic	Description
25366	Electrical Counter		Electrical decremental counter LED indicators: present value, set value, reset, key protection, control output Operation keys: reset, increment, decrement Banana jacks: 1 COM, 1 NO, 1 NC, V+, V-, operation (key, count, gate, reset, V-) Operating voltage: 24 Vdc, 5 A
25359	Relay Unit, 2 NO / 2 NC		Relay unit 3 separate relays, each with 4 changeover contacts: 2 NO, 2 NC Banana jacks (per relay): 2 COM, 2 NO, V+, V-, Operating voltage: 24 Vdc, 5 A
25375	Relay Unit, 3 NO / 1 NC		Relay unit 3 separate relays, each with 4 changeover contacts: 3 NO, 1 NC Banana jacks (per relay): 2 COM, 2 NO, V+, V-, Operating voltage: 24 Vdc, 5 A
3031	PLC MicroLogix		PLC MicroLogix 8 Digital Inputs with Banana Cables 6 Relay Outputs with Banana Cables Indication LEDs Red Power Supply Cable (+) Black Power Supply Cable(-) Red COM Cable Communication Cable Wire Holder
3005 (3004)	CP/C 2000A Control Unit		Control unit Banana jacks: 8 digital inputs (10 Vdc) 8 digital outputs, NO 4A max. LED indicators: I/Os, voltage 8 push button/toggle switches Power switch Operating voltage: 100/220Vac RS232 serial com: 8 bit

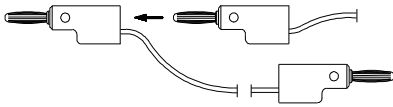
Cat #	Name	Schematic	Description
3007	Electro-Mechanical Switching Unit 		Electro-mechanical switching unit 2 digital relays with changeover contact Timer NO and NC Counter unit Two switches (push button/toggle) Operating voltage: 24 Vdc, 5 A
Power Supplies			
430718 430719	Power Supply, 2A 		Input voltage: #430718: 220 Vac / 24 Vdc #430719: 110 Vac / 24 Vdc Output voltage: 24 Vdc Output current max.: 2 A
3009 3010	Power Supply, 3A 		Input voltage: #3009: 220 Vac / 24 Vdc #3010: 110 Vac / 24 Vdc Output voltage: 24 Vdc Output current max.: 3 A
430722 430721	Power Supply, 4A 		Input voltage: #430722: 220 Vac / 24 Vdc #430721: 110 Vac / 24 Vdc Output voltage: 24 Vdc Output current max.: 4 A
Vacuum Device			
25342	Vacuum Generator and Pad 		Vacuum generator Pressure range: 2-10 bar
Compressed Air Supply			

Cat #	Name	Schematic	Description
<p>25310</p> <p>BASIC</p>	<p>Conditioning Unit</p> 		<p>The conditioning unit is positioned between the air source and the components in the pneumatic circuit. The conditioning unit provides compressed clean, dry, oil-enriched air at a constant pressure to the system.</p> <p>The conditioning unit includes the following elements:</p> <ol style="list-style-type: none"> (1) Pressure regulator inlet port (port A) with a sleeve shut-off valve. This shut-off valve serves to connect and disconnect the conditioning unit, and thus all PneuFlex components, from the pressure supply. The valve inlet port has a $\varnothing 5\text{mm}$ push-in fitting. (2) Pressure gauge, displays the pressure at the unit's outlet. To regulate pressure, perform the following steps. <ul style="list-style-type: none"> • Open the shut-off valve, and make sure no air leaks are detected. • Lift the regulator knob and turn it clockwise or counterclockwise to adjust the pressure setting. • When the pressure has been correctly set, push down the regulator knob to secure it. (3) Water trap, which collects condensation. (4) Air filter, which filters out impurities. (5) Lubrication unit for the system components. <p>Max. inlet pressure: 16 bar Pressure range: 0-8 bar</p>
<p>Tubing and Connectors</p>			

Cat #	Name	Schematic	Description
324414 324415 324416 BASIC	Tubing 		Plastic air tubes: 324414 Orange: Inner Ø 3 mm Outer Ø 5 mm 324415 Blue: Inner Ø 3 mm Outer Ø 5 mm 324416 Clear: Inner Ø 4 mm Outer Ø 6 mm Tubing can be cut to any required length. The blue Ø6 mm tubing is used to connect the air supply and the conditioning unit. The clear and orange Ø5mm tubing is used to connect the components on the panel.
25321 BASIC	Quick Coupler 		Quick coupler for manifold/air tubing connections Input Ø ¼" (6.35 mm) Output Ø 5 mm
324060 BASIC	Quick Connector Ø 5 mm 		Straight metal fitting 1/8" thread for air tube outer Ø 5 mm Since some components may be too far apart to connect with a single hoses, Ø5mm push-in connectors are used to join two hoses and extend the length of hose between two components.
324035	Quick Connector Swivel Ø 5 mm 		Elbow (90°) metal fitting 1/8" thread for air tube outer Ø 5 mm

Cat #	Name	Schematic	Description
<p>324059 324095 BASIC</p>	<p>Quick T-Connector</p> 		<p>T-connector metal fitting, #324059: for outer \varnothing 5mm tube #324095: for outer \varnothing 6mm tube</p>
<p>25306 BASIC</p>	<p>Manifold</p> 		<p>Manifold, 5 ports Quick couplings Connectors for \varnothing 5 mm air lines Pressure range: 0-10 bar</p> <p>Port A admits pressurized air. Ports B, C, D, and E are used to direct pressurized air to the components. Each of these ports has a quick coupling female connector, which prevents air flow through the connector when it is not in use.</p>
<p>25341</p>	<p>Manifold with Slide Valve</p> 		<p>Manifold, 5 ports Quick couplings Connectors for \varnothing 5 mm air lines 3/2 manual shut-off valve Pressure range: 1-10 bar</p>
Didactic			
<p>25320</p>	<p>Slotted Panel</p> 		<p>Aluminum panel, with vertical slots for mounting and repositioning components Width: 800 mm Depth: 510 mm Height: 750 mm Position grid: 40x40 mm</p>

Cat #	Name	Schematic	Description
25351	Double-Sided Slotted Panel 		<p>Two-sided aluminum panel, with horizontal slots for mounting and repositioning components</p> <p>Width: 1000 mm Depth: 520 mm Height: 800 mm Position grid: 40x40 mm</p>
11021	Mounting Plate 		<p>Mounting plate for attaching components to panel</p> <p>190 mm x 108 mm</p> <p>Non-standard components can be used on the panel by attaching them to this plate by means of the pre-drilled holes.</p>
25451	Bolt-Nut Pair 		<p>For attaching mounting plates to slotted panel.</p>
330212	Hex Wrench 		<p>Tool for attaching components to slotted panel.</p>
10020	Bracket for CP/C2000A 		<p>Bracket for attaching CP/C2000A unit to panel</p>

Cat #	Name	Schematic	Description
411649 411650 411651 411652 411653 411654 ELECTRO	<p>Cables with 4 mm Stacking Banana Plugs</p> 		Universal flexible lines with 4 mm banana plugs #411649 Red 24" (610mm) #411650 Black 24" (610mm) #411651 Gray 24" (610mm) #411652 Red 48" (1220mm) #411653 Black 48" (1220mm) #411654 Gray 48" (1220mm)