

**BRING TECHNICAL CONCEPTS TO LIFE FOR YOUR STUDENTS**

with **TPC iSchematic Animated PowerPoint™** presentations!

Schoolcraft Publishing offers dynamic and animated PowerPoint presentations for the technical concepts introduced in your classroom. These PowerPoints are designed to be a versatile and adaptable addition to your lectures. Our PowerPoints are a wonderful partner to any textbook and work well in every classroom environment.

Visit each animated PowerPoint Series' page to view a list of topics available in each PowerPoint presentation.

**AC/DC Drives**

The AC/DC Drives PowerPoint Series contains 8 PowerPoint presentations that feature slides on AC/DC drives, AC, DC motors, brushless DC motors, and brushless servo motors and many more on over 250 slides.

**Electrical**

The Electrical PowerPoint Series contains 4 PowerPoint presentations that feature slides on electrical circuits, capacitors, electrical testers, and many more on nearly 300 slides.

**Hydraulic**

The Hydraulic PowerPoint Series contains 14 PowerPoint presentations that feature slides on hydraulic valves, pumps, check valves, and many more on over 500 slides.

**Mechanical**

The Mechanical PowerPoint Series contains 8 PowerPoint presentations that feature slides on force and motion, brakes, bearings, belts, and many more on over 200 slides.

**Pneumatic**

The Pneumatic PowerPoint Series contains 8 PowerPoint presentations that feature slides on compressor, lubricators, actuators, control valves, and many more on over 400 slides.

BRING IMPORTANT CONCEPTS TO LIFE FOR YOUR STUDENTS with TPC iSchematic Animated PowerPoint™ presentations!

Schoolcraft Publishing now offers dynamic and animated PowerPoint presentations on AC/DC Drives, Electrical, Hydraulic, Mechanical, and Pneumatic systems.

These PowerPoints are designed to enhance your presentation of AC/DC drives, AC/DC motors, brushless DC motors, and brushless servo motors. Seeing the parts of an AC/DC drive function separately and together will help your students visualize and better understand electrical principles.

The animated PowerPoints are versatile and adaptable—they work well with any textbook, in a classroom or training environment, or as an excellent stand-alone visual resource.

## Fundamentals of AC/DC Drives

### System Technology

- Electromechanical System
- Voltage
- Current
- Frequency
- Sine Wave
- Resistance

### Electromechanical System Components

- Power Source
- Controller
- Drive
- Motor
- Feedback Loop
- Coupling
- Machine

### Horsepower, Torque & Speed

- Horsepower
- Torque
- Speed

## Load Identification Concepts

- Constant Torque Loads
- Constant Horsepower
- Variable Torque Loads

## DC Motors

### Magnetism & Electromagnetism

- Magnetism
- Electromagnetism

### DC Motor Terms

- Armature Current
- Base Speed
- Commutation
- Field Current
- Flux

### DC Motor Operation

- Power Electromagnetism

### DC Motor Classification

- Series Wound Motor

- Shunt Wound Motor
- Compound Motor
- Stabilized Shunt Motor

## AC Motors

### AC Motor Operation 1

- Breakdown Torque
- Cogging
- Slip
- Starting Current
- Starting Torque

### AC Motor Operation 2

- Induction
- Induction Magnetism
- Motoring Action
- Slip Calculation
- Torque Protection

### NEMA Classifications

- Design A
- Design B
- Design C
- Design D

## Key Benefits for Teachers/Trainers:

- Flexible classroom options. Walk students through the explanation of concepts using the hundreds of provided slides, and then bring the concepts to life with the detailed and high quality animation that follows.
- Comprehensive coverage of important concepts.
- You can easily customize a presentation to your lectures and discussions by dropping them into your own PowerPoints for even more flexibility.
- Add your own text and information to our slides and animations to enhance and drive home your curriculum.
- With the Slide View option, students cannot just visualize the concepts but hear the explanations as well—great for quick review to help them prepare for exams and further enhance their understanding, freeing up your time.

Please Note: Animations are PC compatible only

## Key Benefits for Students

- Helps you create “aha” moments as students can “see” principles in action!
- Builds strong retention when student “see” how things work as opposed to just an explanation.

### DC Drives

#### Control Section

#### Power Section

#### Armature Bridge

- DC Contactor
- AC/DC Conversion
- Field Bridge

#### DC Drive Functions

- Power Conversion

### AC Drives

#### Control Section

#### Power Section

- DC Converter Section
- Filter Section
- Inverter
- Driver Inverter Classification

#### AC Drive Functions

#### Power Conversion

- Power Conversion Path
- AC/DC Conversions
- Voltage Spike Smoothing
- DC to AC Inversion

### AC/DC Braking Methods

#### AC/DC Braking Methods

- Coasting
- Mechanical Braking
- Electrical Braking
- Dynamic Braking
- Regenerative Braking
- Deceleration Modes

#### Commutation

- DC Motor Commutation
- Brushless Commutation

### Motor Performance

- Motor Specifications
- Speed Torque Curves

### Brushless DC Motors

#### Motor Components

- Rotor
- Stator
- Feedback
- Holding Brake

#### Commutation

- DC Motor Commutation
- Brushless Commutation

### Motor Performance

- Motor Specifications
- Speed Torque Curves

### Selecting a Brushless Motor

- Constant Torque
- Distance in Motor Rev
- Maximum Rotational Speed
- Angular Acceleration of Motor Shaft
- Load Component Inertia
- Motor's Rotor Inertia
- Load to Motor Inertia
- Acceleration Deceleration Torque
- Peak Torque
- RMS Torque

### Brushless Servo Drives

#### Servo Drive

#### Power Input Section

- Input Protection
- Rectification
- Filtering
- Bus Discharge

#### Power Output Section

- Transistor Types
- Three-Phase Bridge
- PWM

#### Control Section

- Commutation
- Loop Closure
- PID

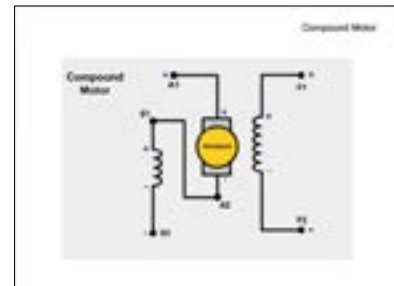
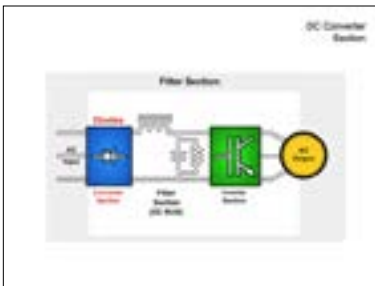
#### Input/Output

- Digital I/O
- Analog I/O
- Fieldbus

#### Power Cables

#### Servo Actuators

- Bottle Filler
- Edge Guide
- Press



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**BRING ELECTRICAL CONCEPTS TO LIFE FOR YOUR STUDENTS** with **TPC iSchematic Electrical PowerPoint™** presentations!

Schoolcraft Publishing now offers dynamic and animated PowerPoint presentations on Electrical concepts from IntelliSchematic. These PowerPoints are designed to enhance your presentation of electrical circuits, capacitors, electrical testers, and hundreds of other topics. Seeing the parts of a electrical system function separately and together will help your students visualize and better understand electrical principles.

This package consists of: 4 PowerPoint presentations. These presentations contain nearly 300 slides!

The animated PowerPoints are versatile and adaptable—they work well with any textbook, in a classroom or training environment, or as an excellent stand-alone visual resource.

### Electrical Fundamentals

#### Electron Theory

Bohr's Atom  
Electron Transfer

#### Units & Symbols

Constants  
Variables  
SI Prefixes  
Electrical Charges

#### Voltage

Voltage Defined  
Volts Applied

#### Current

Current Defined  
Density  
Electrical Energy  
Current Applied

#### Resistance

Resistance

Conductance  
Resistors

#### Inductance

Inductance  
Inductors  
Inductor Voltage  
Energy Stored

#### Capacitance

Capacitance  
Capacitors  
Current  
Voltage  
Energy Stored

#### Electrical Laws

Ohms Law  
Watts Law / Power

#### Basic Magnetism

Applications  
Magnetism

Magnetic Fields  
Polarity  
Right Hand Rule

### Electrical Circuits

#### Circuits Defined

Circuits  
Node  
Loop  
Branch  
Open-Closed  
Short Circuit  
Disconnection  
Ground  
Circuit Protection

#### Series Circuits

Defined  
Batteries  
Resistors  
Inductors  
Capacitors

### Key Benefits for Teachers/Trainers:

- Flexible classroom options. Walk students through the explanation of concepts using the hundreds of provided slides, and then bring the concepts to life with the detailed and high quality animation that follows.
- Comprehensive coverage of electrical concepts.
- You can easily customize a presentation to your lectures and discussions by dropping them into your own PowerPoints for even more flexibility.
- Add your own text and information to our slides and animations to enhance and drive home your curriculum.
- With the Slide View option, students cannot just visualize the concepts but hear the explanations as well—great for quick review to help them prepare for exams and further enhance their understanding, freeing up your time.

Please Note: Animations are PC compatible only

## Key Benefits for Students

- Helps you create “aha” moments as students can “see” electrical principles in action!
- Builds strong retention when student “see” how things work as opposed to just an explanation.

### Series Law

Ohm’s Law  
Watt’s Law

### Parallel Circuits

Defined  
Batteries  
Resistors  
Inductors  
Capacitors

### Combination Circuits

Combination Circuits  
Reduction

### Circuit Components

Switches  
Diodes  
Transistors  
IC’s  
Solenoids  
Relays  
Transformers  
Resistors  
Fuses  
Circuit Breakers  
Display Elements

### Using Electrical Testers

#### Types of Meters

Analog Meters  
Digital Meters

#### Meter Features

Display  
Dial  
Port Panel

#### Safety in Electrical Testing

Personal Safety  
Equipment Safety

#### Multi-Meter Basics

Resolution  
Digits / Counts  
Range / Resolution  
Accuracy  
Verifying Your Tester

#### Testing Voltage

Testing DC Voltage  
Testing AC Voltage

### Testing Current

Clamp-On Meter

### Testing Components

Testing Continuity  
Testing Resistance  
Testing Capacitance  
Testing Diodes

### Starting and Charging Circuits

#### Battery Systems

Battery Basics

#### Charging Systems

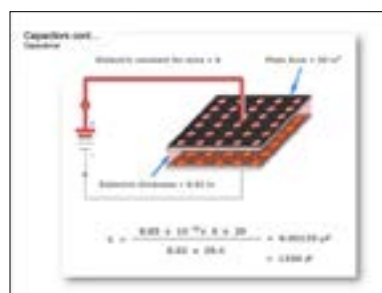
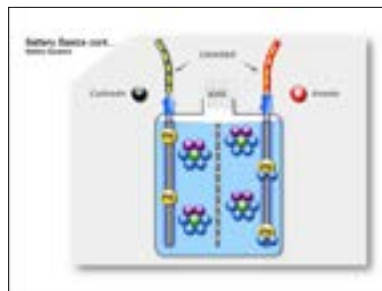
Charging System Basics

#### Starting System

Starting System Basics  
Control Crank Circuits  
Remote Start and Stop

Please Note:

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## Animated Hydraulic PowerPoints

BRING HYDRAULIC CONCEPTS TO LIFE FOR YOUR STUDENTS with TPC iSchematic Hydraulic PowerPoint™ presentations!

Schoolcraft Publishing now offers dynamic and animated PowerPoint presentations on Hydraulic concepts from TPC. These PowerPoints are designed to enhance your presentation of hydraulic valves, pumps, check valves, and hundreds of other topics. Seeing the parts of a hydraulic system function separately and together will help your students visualize and better understand hydraulic principles.

This package consists of: 14 PowerPoint presentations. These presentations contain over 500 slides!

The animated PowerPoints are versatile and adaptable—they work well with any textbook, in a classroom or training environment, or as an excellent stand-alone visual resource.

### Applied Fluid Power Physics

Energy  
Force and Motion  
Work  
Torque  
Power  
Horsepower  
Conservation of Energy  
Flow Rate  
Fluid Velocity  
Formulas  
Pascal's Law  
Series Resistance  
Parallel Resistance  
Load Pressure  
Pressure Drop  
System Pressure  
Flow and Pressure

### Basic Components

Fluids  
Reservoirs  
Pumps  
Actuators

Flow Control  
Directional Control  
Pressure Control  
Fluid Filtration

### Hydraulic Systems

Industrial System  
Mobile System  
Schematics

### Hydraulic Pumps

External Gear  
Crescent  
Geroter  
Axial Piston  
Radial Piston  
Vane  
Double Pumps  
Axial Piston  
Vane  
Radial Piston  
Pressure Compensated  
Load Sense

### Hydraulic Actuators

Tie Rod Cylinders  
Mill Cylinders  
Welded Cylinders  
Telescoping Cylinders  
Rotary Actuators  
External Gear  
Geroller  
Geroter  
Axial Piston  
Bent Axis Piston  
Radial Piston  
Cylinder Symbols  
Motor Symbols

### Hydraulic Valves

**Pressure Control**  
Direct Acting Pressure Valves  
Pilot Operated Pressure Valves  
Relief Valve  
Remote Pressure Control  
Venting Relief Valve  
Reducing Valve  
Sequence Valve

Counterbalance Valve  
Brake Valve  
Unloading Valve

### Directional Control

Spool Positions  
Spool Center Conditions  
Open Center Circuit  
Closed Center Circuit  
Direct Acting Valves  
Manual Actuator  
Mechanical Actuator  
Pneumatic Actuator  
Hydraulic Actuator  
Detent Control  
Pilot Operated Directional Valves  
Mounting Standards  
Mobile Monoblock Valves  
Multiple Spool Monoblock  
Mobile Sectional Valves  
Multiple Spool Sectional Valves  
Power Beyond Application

## Key Benefits for Teachers/Trainers:

- Flexible classroom options. Walk students through the explanation of concepts using the hundreds of provided slides, and then bring the concepts to life with the detailed and high quality animation that follows.
- Comprehensive coverage of hydraulic concepts.
- You can easily customize a presentation to your lectures and discussions by dropping them into your own PowerPoints for even more flexibility.
- Add your own text and information to our slides and animations to enhance and drive home your curriculum.
- With the Slide View option, students cannot just visualize the concepts but hear the explanations as well—great for quick review to help them prepare for exams and further enhance their understanding, freeing up our time.





## Key Benefits for Students

- Helps you create “aha” moments as students can “see” hydraulic principles in action!
- Builds strong retention when student “see” how things work as opposed to just an explanation.

### Flow Control

Gear Type Flow Divider  
 Spool Type Flow Divider  
 Priority Flow Divider  
 Meter-In Flow Control  
 Meter-Out Flow Control  
 PC Flow Control

### Check Valves

In-Line Check Valve  
 Pilot Operated Check Valve  
 Pre-Fill Valves  
 Shuttle Valves

### Valve Symbols

Pressure Control Symbols  
 Flow Control Symbols  
 Directional Control Symbols  
 Check Valve Symbols

### Modular Valves

Stack Valves  
 Manifold Application  
 Schematic Arrangement  
 Cartridge Valves  
 Pressure Control  
 Flow Control  
 Directional Control  
 Logic Valves  
 Pressure Control  
 Directional Control  
 Flow Control

### Accumulators

Piston Type  
 Bladder Type  
 Supplemental Flow  
 Maintain Pressure  
 Shock Suppression  
 Safety Isolation

### Fluid Conditioning

Filtration  
 Micron  
 Beta Ratio  
 ISO Code  
 Filter Operation

Filter Breather  
 Pressure Filter  
 Return Filter  
 Kidney Loop Filtration

Industrial  
 Industrial Applications  
 Mobile

Tank Heaters  
 Tube and Shell Heat Exchanger  
 Air Cooled Heat Exchanger  
 Mobile Heat Exchanger

Filter Symbols  
 Reservoir Symbols  
 Heat Exchangers

### Fluid Conductors

Hose  
 Tubing  
 Pipe  
 Quick Disconnects  
 Minimus Connector

### Connectors

Hose Connectors  
 Tube Connectors  
 Adapters

### Ball Valves

2-Way  
 3-Way

### Flow Consideration

Conductor Sizing  
 Flow Velocity

### Sensors and Switches

**Flow and Pressure**  
 Pressure Gauge  
 Flow Meter

### Electromechanical Switches

Pressure Switch  
 Limit Switch  
 Temperature Switch  
 Level Switch

### Proximity Switches

Inductive  
 Capacitive  
 Optical

### Transducers

Pressure  
 Temperature

### Hydrostatic Transmission

Open Circuits  
 Closed Circuits  
 Hydrostatic Drive Schematic

Forward  
 Neutral  
 Reverse

### Electro-Hydraulics

#### Intro to Proportional Controls

Theory of Operation  
 Force Solenoid  
 Control Amplifier  
 Pulse Width Modulation  
 Feedback Control

### Applications

Directional Control  
 Pressure Control  
 Flow Control

### Mobile

Electronics  
 Proportional Valves

### Circuit Types

Open Loop Circuit  
 Closed Loop Circuit

### Hydraulic Troubleshooting

Hydraulic Safety  
 Application of Principles  
 Hydraulic Symbols  
 Reading Schematics  
 Mobile Circuits  
 Industrial Circuits

**BRING MECHANICAL CONCEPTS TO LIFE FOR YOUR STUDENTS** with TPC iSchematic Mechanical PowerPoint™ presentations!

Schoolcraft Publishing now offers dynamic and animated PowerPoint presentations on Mechanical concepts from TPC. These PowerPoints are designed to enhance your presentation of force and motion, brakes, bearings, belts, and hundreds of other topics. Seeing the parts of a mechanical system function separately and together will help your students visualize and better understand mechanical principles.

This package consists of: 8 PowerPoint presentations. These presentations contain over 200 slides!

The animated PowerPoints are versatile and adaptable—they work well with any textbook, in a classroom or training environment, or as an excellent stand-alone visual resource.

## Fundamentals of Mechanics

### Applied Physics

Force and Motion  
Work  
Torque  
Power  
Horsepower

## Mechanical Actuators

Jack Screws  
Machine Screw  
Ball Screw  
Slider Crank  
Rack & Pinion

## Mechanical Clutches

Friction/Disc  
Spring  
Sprang  
Roller Ramp  
Electromagnetic

## Mechanical Brakes

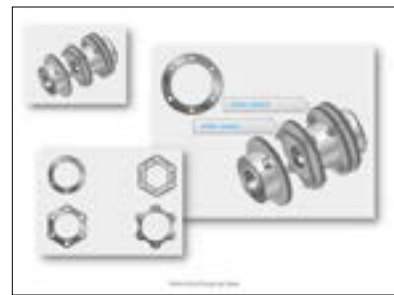
Friction/Disc  
Band  
Drum  
Electromagnetic

## Bearings

Applications  
Terminology

## Thrust Bearing

Ball Bearing  
Roller Bearing  
Thrust Bearing  
Thrust Ball  
Cylindrical Roller  
Needle Roller  
Spherical Roller



## Key Benefits for Teachers/Trainers:

- Flexible classroom options. Walk students through the explanation of concepts using the hundreds of provided slides, and then bring the concepts to life with the detailed and high quality animation that follows.
- Comprehensive coverage of mechanical concepts.
- You can easily customize a presentation to your lectures and discussions by dropping them into your own PowerPoints for even more flexibility.
- Add your own text and information to our slides and animations to enhance and drive home your curriculum.
- With the Slide View option, students cannot just visualize the concepts but hear the explanations as well—great for quick review to help them prepare for exams and further enhance their understanding, freeing up your time.

Please Note: Animations are PC compatible only



## Key Benefits for Students

- Helps you create “aha” moments as students can “see” mechanical principles in action!
- Builds strong retention when student “see” how things work as opposed to just an explanation.

### Gears

#### Gear Fundamentals

Applications  
Terminology  
Gear Boxes

#### Gear Types

Spur  
Helical  
Bevel  
Hypoid  
Worm

### Mechanical Couplings

#### Coupling Types

Rigid  
Flexible  
Gear  
Chain  
Metal-Disc  
Metal Beam  
Elastomeric Jaw  
Elastomeric Shear Tire  
Universal Joints

### Belt & Chains Drives

#### V-Belts

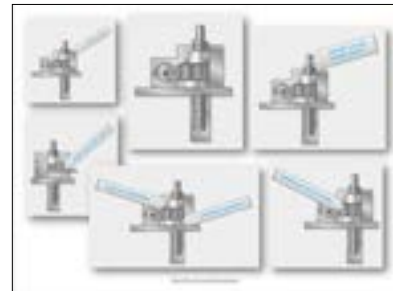
Description of Operation  
Terminology

#### Synchronous Belts

Functional Description  
Terminology

#### Chain

Chain Drives



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BRING PNEUMATIC CONCEPTS TO LIFE FOR YOUR STUDENTS with TPC iSchematic Pneumatic PowerPoint™ presentations!

Schoolcraft Publishing now offers dynamic and animated PowerPoint presentations on Pneumatic concepts from TPC. These PowerPoints are designed to enhance your presentation of compressors, lubricators, actuators, control valves, and hundreds of other topics. Seeing the parts of a pneumatic system function separately and together will help your students visualize and better understand pneumatic principles.

This package consists of: 8 PowerPoint presentations. These presentations contain over 400 slides!

The animated PowerPoints are versatile and adaptable—they work well with any textbook, in a classroom or training environment, or as an excellent stand-alone visual resource.

## **Pneumatic Fundamentals**

### **Applied Physics**

Work  
Power  
Horsepower  
Formulas  
Flow  
Pressure  
Pressure Scales  
Pressure Drop  
Boyle's Law  
Charles' Law  
Lussac's Law  
Combined Gas Law  
Bernoulli's Principle

## **Pneumatic Compressors**

### **Terminology**

SCFM  
Compressed CFM  
Staging  
Unloading

## **Displacement Compressors**

Piston  
Diaphragm  
Vane  
Screw

## **Support Components**

Inlet Filter  
Intercooler  
Aftercooler  
Air Receiver  
Safety Relief Valve  
Pressure Switch

## **Pneumatics Air Pressure**

### **Dryers**

Dew Point Dryers  
Refrigerant Dryers  
Deliquescent Dryers  
Desiccant Dryers

### **Air Preparation**

Filters

Standard Filters  
Coalescing Filters  
Absorbing Filters

### **Air Regulators**

Non-Relieving  
Relieving

### **Lubricators**

Functional Description

## **Air Conductors and Distribution**

### **Conductors**

Pipe  
Hoses  
Tubing  
Connectors

### **Air Distribution**

Primary Lines  
Secondary Lines  
Dead End System

## **Key Benefits for Teachers/Trainers:**

- Flexible classroom options. Walk students through the explanation of concepts using the hundreds of provided slides, and then bring the concepts to life with the detailed and high quality animation that follows.
- Comprehensive coverage of pneumatic concepts.
- You can easily customize a presentation to your lectures and discussions by dropping them into your own PowerPoints for even more flexibility.
- Add your own text and information to our slides and animations to enhance and drive home your curriculum.
- With the Slide View option, students cannot just visualize the concepts but hear the explanations as well—great for quick review to help them prepare for exams and further enhance their understanding, freeing up your time.

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## Key Benefits for Students

- Helps you create “aha” moments as students can “see” pneumatic principles in action!
- Builds strong retention when student “see” how things work as opposed to just an explanation.

Loop System  
Decentralized System

### Pneumatic Actuators

#### Cylinders

Disposable  
Tie Rod  
Non Rotating  
Rodless

#### Air Motors

Vane  
Piston

#### Rotary Actuators

Vane  
Rack & Pinion

### Pneumatic Control Valves

#### Directional Control Valves

Direct Acting  
Pilot Operated  
Spool Type  
Poppet  
Sliding Plate Valves

#### Valves Actuators

Defined

#### Valves Application

Defined  
Power Valves  
Control Valves

### Miscellaneous Valves

Check Valves  
Shuttle Valves  
Pulse Valves  
Quick Exhaust Valve  
Flow Control  
Slow Start Valve  
Lockout Valve  
Excess Flow Valve

### Vacuum Control Fundamentals

#### Basic Physics

Vacuum Defined  
Vacuum Pressure Scale

#### Vacuum Generation

Vacuum Pumps  
Vacuum Generators

#### Vacuum Applications

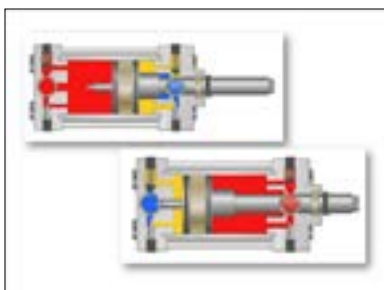
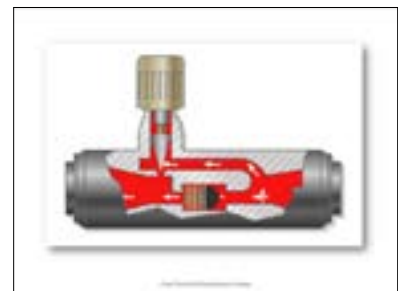
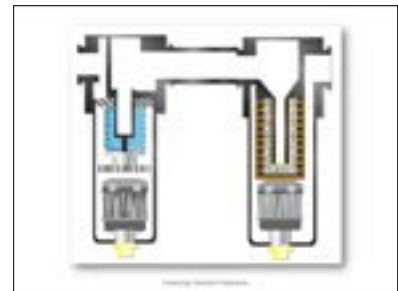
Lifting  
Forming  
Holding

### Pneumatic Symbols and Circuits

#### Symbolism

Lines  
Air Receiver/Air Dryer  
Energy Source/Exhaust  
Flow Control  
Directional Control  
Compressor, Vacuum Pump

Check, Shuttle, Quick  
Exhaust Valves  
FRL  
Coolers  
Misc. Components  
Actuators



Please Note:  
Animations are PC compatible only