The Collection of Transparencies is conceived for the basic material of the TP200
Electropneumatic Technology Package. The transparency collection and technology
package form part of the The Learning System for Automation from Festo Didactic
GmbH & Co.

The transparencies are designed from a didactical and methodological point of view.
For each transparency, there is a short accompanying text that provides the speaker
with a quick overview of the contents. More information you will find in the textbook
Electropneumatics.

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The text pages contain a complete picture of the transparency with some additional
explanations and items which the speaker can mark on the transparency during
instruction.

The advantages of this concept are:
- The speaker can add to the transparencies step-by-step during instruction.
- Instruction is livelier.
- The accompanying texts provided reduce preparation time.

The enclosed CD-ROM contains all the overhead transparencies and accompanying
text of this edition in an electronically presentable form in the files
„Electropneumatics _ transparencies.pdf“ and „Electropneumatics _text.pdf“. In
addition to the screen presentation, which can be made in any order, the contents
can be printed out and text and graphics can be used for your own training
preparations, insofar as the functionality of the required Adobe® Acrobat® Reader
permits this. This freely distributable software is available on the CD-ROM in the
currently valid English version for Windows 95/98/NT for installation in the directory
„Acrobat_Reader“. Please start the file „rs405eng.exe“ and follow the subsequent
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Elements of a Control Chain

The principle of the control chain is used for the preparation of the circuit diagram. Every element of a control chain has a certain task to perform in the processing and further transmission of signals.

This structuring of a system into functional blocks has proven itself in the following tasks:

- Arrangement of the elements in the circuit diagram
- Definition of the nominal sizes, nominal current and nominal voltage of components
- Set-up and commissioning of the controller
- Identification of the components for maintenance work
Elements of a Control Chain

**Pneumatics/Hydraulics**
- Cylinders
- Motors
- Components
- Directional control valves
- Directional control valves
- Isolating valves
- Pressure valves
- Switches
- Push button actuators
- Limit switches
- Program module
- Sensors

**Electrics/Electronics**
- Electric motors
- Solenoids
- Linear motors
- Power contactors
- Power transistors
- Power thyristors
- Contactors
- Relays
- Electronic modules
- Switches
- Push button actuators
- Limit switches
- Program module
- Sensors
- Indicators/generators
**Single-Acting Cylinder**

Compressed air is applied to only one side of the single-acting cylinder.

The piston rod side of the cylinder is vented to atmosphere.

Single-acting cylinders can perform work in only the advance direction of travel.

The piston rod is driven inwards by the force of a built-in spring or by external forces.
Single-Acting Cylinder
Double-Acting Cylinder

The double-acting cylinder is actuated in both directions with compressed air. It can perform work in both directions of movement. The force transmitted to the piston rod is greater during the advance stroke than during the return stroke.
Double-Acting Cylinder
Non-return, Flow Control and Pressure Control Valves

Non-return valves block the flow in one direction and release it in the opposite direction. A distinction is made between:

- Non-return valves
- Shuttle valves (OR)
- Dual pressure valves (AND)
- One-way flow control valves
- Quick exhaust valves

Pressure control valves influence the pressure or are controlled through the size of the pressure. A distinction is made between:

- Pressure regulating valves
- Pressure relief valves
- Pressure sequence valves

Sloping arrow – the valve is adjustable

Non-return valves
- Non-return valve (check valve)
- Non-return valve, spring-loaded
- Shuttle valve (OR function)
- Dual pressure valve (AND function)
- Quick exhaust valve
- One-way flow control valve

Flow control valve
- Flow control valve (throttle valve), adjustable

Pressure control valve
- Adjustable pressure regulating valve without relief port
- Adjustable pressure regulating valve with relief port
- Pressure sequence valve with external supply line
- Pressure-relief valve
- Pressure sequence valve-combination
Non-return, Flow Control and Pressure Control Valves

Non-return valves
- Non-return valve (check valve)
- Non-return valve, spring-loaded
- Shuttle valve (OR function)
- Dual pressure valve (AND function)
- Quick exhaust valve
- One-way flow control valve

Flow control valve
- Flow control valve (throttle valve), adjustable

Pressure control valve
- Adjustable pressure regulating valve without relief port
- Adjustable pressure regulating valve with relief port
- Pressure sequence valve with external supply line
- Pressure-relief valve
- Pressure sequence valve-combination