


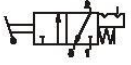


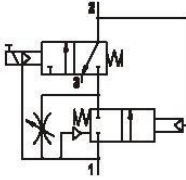




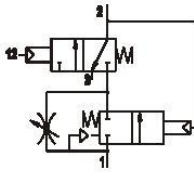














## 04 - Pneumatic symbols

- FRL
- Valves and Solenoid valves,
- Auxiliary valves,
- Connectors and pipe
- Cylinders

## AIR SERVICE UNITS

Air treatment mechanisms	Other mechanisms
Pneumatic accumulator (capacity) 	Pressure gauge 
Automatic drain air 	Shut-off valve 
Automatic drain air 	
Lubricator 	Progressive start-up valve With Electric control 
Air filter 	
Filter - with manual drain 	
Filter - with automatic drain 	
<b>Pressure control valves</b>	
Pressure switch 	Progressive start-up valve With Pneumatic control 
Free discharge pressure relief valve 	
Free discharge pilot-operated pressure relief valve 	
Sequence valve 	
Pressure regulator 	
Pressure regulator without exhaust valve 	
Pilot-operated pressure regulator without exhaust valve 	
Pressure regulator without exhaust valve (free) 	
Differential pressure regulator 	
<b>Assembled units</b>	
Filter pressure regulator 	
Filter pres. reg. + lubricator Filter + pres. reg. + lubricator 	

## VALVES AND SOLENOID VALVES

### - Terms and descriptions -

The connections to the inlet and outlets of the valves can be of two types:

**- main connections:**

- supply connection identified with number 1
- consumption connection identified with number 2 and 4
- exhaust connection identified with number 3 and 5

**- Pilot connections:**

- repositioning connection on 2/2 & 3/2 ways valves identified with number 10
- switching connection on 2/2 & 3/2 ways valves and repositioning connection on 5/2 & 5/3 ways valves identified with number 12
- switching connection on 5/2 & 5/3 ways valve identified with number 14

**Switching** : is the process that changes the state of a valve from rest position to actuated position and is achieved by means of a mechanical, pneumatic or electric signal

**Repositioning**: is the process that changes the valve state from actuated back to rest position and is achieved by means of an external mechanical (spring), pneumatic (differential) or electric signal

**Ways**: indicated the number of connections on the valve body and on the pneumatic diagram

**Positions**: indicates the number of positions achieved by the valve and corresponds to the number of squares on the pneumatic simple.

**Function**: indicates the valve working diagram at rest condition and corresponds to the right square in the pneumatic scheme.

### Valves symbols

Way	Pos.	Function	Symbol
2	2	Normally closed	
2	2	Normally open	
3	2	Normally closed	
3	2	Normally open	
5	2	Separated exhaust connections	
5	3	Closed centres	
5	3	Open centres	
5	3	Pressured centres	

### Switching and Repositioning

Mechanical		Pneumatics	
Plunger		Pneumatic	
Sensitive plunger		Pneumatic - return to center	
Roller		Pneumatic - depressurised	
Unidirectional roller		Differential (pneumatic spring)	
Sensitive roller		Differential external pilot	
Pedal		Sensitive differential	
Pedal - spring return			
Push Button			
Sensitive push button			
Push button - two positions-			
Lever			
Lever - spring to center			
Sensitive lever			
Two position mechanical stop			
Three position mechanical stop			
Spring			
		Electrical	
		Solenoid	
		Bistable solenoid	
		Solenoid (internal pilot)	
		Solenoid (external pilot)	
		Solenoid - spring to center	
		Solenoid with suppl. pilot	

### Complementary valves

Throttle valve		Silencer	
Bidirectional flow regulator		Non-return valve without spring	
Unidirectional flow regulator		Non-return valve with spring	
Quick exhaust valve		Non-return valve controlled during closing	
Shuttle valve		Non-return valve controlled during opening	

### Piping and connections

Pressure line		One-way rotating intake	
Control line		Three-way rotating intake	
Exhaust line		Closed air intake	
Flexible line		Air intake with connection	
Electric line		Quick coupling connection without non-return valve	
Piping connections		Quick coupling connection with non-return valve	
Piping intersection		Air exhaust unthreaded connection	
Main air connection		Air exhaust threaded connection	

## CYLINDERS

### Single acting cylinders

with external return	
with spring return	

### Double acting cylinders

Standard rod	
Double rod (push/pull version)	
With non adjustable cushioning	
With adjustable cushioning	
With magnetic piston	
With magnetic piston with adjustable cushioning	

### Tandem cylinders

In tandem, common rod	
In tandem, independant rods	
In tandem, opposite rods	
Opposed, common rod	

### Non rotating cylinders

Standard rod / double acting	
Twin rod / double acting	
Twin rod / double acting push/pull rod	
Push/pull twin rod double acting	
Guided compact cylinders	

### Cylinders for piston rod lock

With magnetic piston with adjustable cushioning	
With non magnetic piston with adjustable cushioning	

### Rodless cylinders

With magnetic piston With adjustable cushioning	
Cable cylinders with magnetic piston	
Cable cylinders with non magnetic piston	

### Telescopic cylinders

Single acting	
Double acting	

### Various cylinders

Rotating cylinders	
Rotating cylinder	
Bellows cylinder	

### Pressure boosters

Air-Air intensifier	
Air-oil intensifier	
Hydropneumatic accumulator	

04