


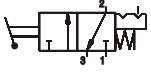



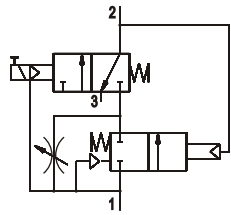


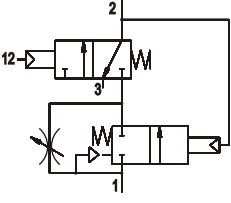















04 - Pneumatic symbols

- 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 	
Air filter 	Progressive start-up valve With Electric control 
Filter - with manual drain 	
Filter - with automatic drain 	
Pressure control valves	Progressive start-up valve With Pneumatic control 
Pressure switch 	
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 	
Assembled units	
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		Electrical	
Push Button		Solenoid	
Sensitive push button		Bistable solenoid	
Push button - two positions-		Solenoid (internal pilot)	
Lever		Solenoid (external pilot)	
Lever - spring to center		Solenoid - spring to center	
Sensitive lever		Solenoid with suppl. pilot	
Two position mechanical stop			
Three position mechanical stop			
Spring			

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	

Cylinders for piston rod lock

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

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	

Rodless cylinders

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

Tandem cylinders

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

Telescopic cylinders

Single acting	
Double acting	

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	

Various cylinders

Rotating cylinders	
Rotating cylinder	
Bellows cylinder	

Pressure boosters

Air-Air intensifier	
Air-oil intensifier	
Hydropneumatic accumulator	