

PNEUMATIC ACTUATORS

Pneumatic cylinders convert pressure to a linear or rotative movement.

Factors in a choice of a cylinder are:

- Single or double acting
- Pressure of the pilot fluid
- Ambient temperature
- Standard dimensions or not
- Cushioned or not cushioned, mounting
- Aggressiveness surrounding medium
- Efforts developed, Ø bore, stroke
- Cadences de fonctionnement
- Equipped or not for magnetic position detectors

Table of cylinder loads and cylinders, see section B

SOLENOID VALVES, CONTROL VALVES

Solenoid valves and control valves 3 ports, 2 positions (3/2) are available in the following versions:

- Normally Closed at rest (symbol : NC)
- Normally Open at rest (symbol : NO)
- Universal (Symbol : U) : depending on connections, they can be used for the 4 following functions : NC, NO - Distribution (1 inlet - 2 outlets) or mixing (2 inlets - 1 outlet)

Factors in choice between spool valves and poppets valves are:

- Size: spool valves from ØM5, G 1/8 to G 1 ; poppet valves from G 1/8 to G 1 1/2
- Pilot: spool valves can be two position positive (bistable-memory) ; poppet valves are always spring return (monostable).
- Functions :

poppet valves 3/2 NC : NO-4/2

spool valves 3/2 NC-NO-U ; 5/2 ; 5/3

- Flow: spool valves have the same Kv or flow coefficients from supply and to exhaust. However some poppet valves have a greater Kv or flow coefficients to exhaust.

- Response time: in high speed movement, the response time can be important
Spool valves have a faster response time than poppet valves

Poppet valves and spool valves do not compete, they are complementary. For each application, the correct valve should be selected bearing in mind the precise requirements.

CONNECTIONS TO VALVES

SUBBASE mounting body: Connection by means of a single or joinable subbase

TAPPED body: Connections directly to the body

Tapped bodies of pneumatic components comply with both standards: ISO 228: (G) and ISO 7: (Rp)

AIR SERVICE EQUIPMENT

Filters, regulators, lubricators and drip leg drain allow smooth operation of compressed air circuit.

For the lubrication, it is recommended to use a non-detergent oil without aggressive additives, **VG 32**, group 2 (ISO 3448).

EASY CONNECTIONS

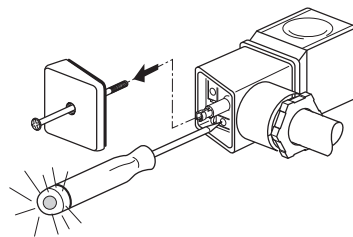
The pilot valves series 302 and solenoid operated valves equipped with these pilots, are delivered with a connector size 15, rotatable by 90°, complying with: EN 175301-803, industry standard form C (9,4 mm) or EN 175301-803, form C (8 mm).

The pilot valves series 189 and solenoid operated valves equipped with these pilots, are delivered with a connector size 22, rotatable by 180°, complying with: EN 175301-803, industry standard form B (11 mm).

The pilot valves series 190/192 and solenoid operated valves equipped with these pilots, are delivered with a connector size 30, rotatable by 90°, complying with standard: ISO 4400 / EN 175301-803, form A (18 mm).

These valves can be equipped with cable outlets, 2 m long, or with built-in visual indicator (LED) and electrical protection, or with **transil** protection (size 30 connector).

Size 30 connector **top cover removable** so that one can check that the coil is energized without unplugging the connector and hence **without interrupting operation** of the solenoid valve.



DEGREES OF PROTECTION PROVIDED BY ELECTRICAL ENCLOSURES (IP Code)

(following standards EN 60529 and IEC 529)

The code letters IP (International Protection) followed by 2 characteristic numeral : e.g. IP65

The first characteristic numeral indicates the degree of protection of the energized parts and internal moving parts against ingress of solid foreign objects.

The second characteristic numeral indicates the degree of protection against ingress of water with harmful effects.

1st NUMERAL		Test	2nd NUMERAL		Test
	Abridged definition			Abridged definition	
0	Non-protected		0	Non-protected	
1	Protected against solid foreign objects Ø 50 mm (eg accidental contact with the hand)		1	Protected against vertically falling water drops (condensation)	
2	Protected against solid foreign objects Ø 12,5 mm (eg finger)		2	Protected against vertically falling water drops when enclosure tilted up to 15°	
3	Protected against solid foreign objects Ø 2,5 mm (eg tools, wires)		3	Protected against spraying water up to 60° on either side of the vertical	
4	Protected against solid bodies Ø 1 mm (eg fine tools and small wires)		4	Protected against splashing water from any direction	
5	Dust-protected (no harmful deposit)		5	Protected against water jets from any direction	
6	Dust-tight		6	Protected against powerful water jets from any direction	
			7	Protected against the effects of temporary immersion in water	

The degree of protection of each product is indicated in its appropriate leaflet, usually IP 65.