Pilot valves
for pneumatic actuators
The process industry has different sub-segments with specific demands such as for:

- oil & gas
- (petro)chemical
- pharmaceutical
- power generation
- water & beverage
- food
- pulp & paper

Pilot valves are used to activate pneumatic actuators operating as the driving force on process valves in both single-acting and double-acting executions. Since the pilot valve can restrict the flow, the actuator and process valve response time performances are strongly influenced by the pilot valve’s flow capacity.

Quality and reliability of process valves are of great importance for the safety and output of the production.

Pilot valves are often installed in environments with low and/or high ambient temperatures, corrosive influences and high mechanical loads. Consequently, they have to be designed for long-term high reliability under harsh conditions.

ASCO/JOUCOMATIC, the industry leader offering the widest variety of solenoid valves in the world
PILOT VALVES FOR THE PROCESS INDUSTRY

To fulfill the actuators’ and the environment requirements, the selection of the pilot valve has to be done carefully regarding:

- mounting interface
- flow capacity
- function
- choice between direct-acting or pilot operated valve
- functional safety
- power consumption and electrical connection method
- communication through fieldbus and remote I/O
- environment: temperature, humidity, aggressive atmosphere; if applicable, explosion-proof zone and protection method

**Different types of pneumatic actuators:** rack & pinion, scotch yoke, linear ...

To give the best solution for your application, ASCO/Joucomatic provides unique pilot valve solutions including:

- intrinsic safety
- low power
- direct Namur mount
- safety shutdown systems

Pilot valves which will operate at extremely low power levels and interface with all major protocols including ASInterface, DeviceNet, Profinet-PA and Foundation Fieldbus.

Pilot valves are available in a large selection of:

- 3-, 4- and 5-way direct-acting or pilot operated/pressure assisted versions
- brass, stainless steel, aluminium and plastic valves
- sealing materials in a wide range of resilient
- ATEX and other solenoid operator endosures are available to operate from -50°C to +100°C in normal or explosive environments.
**Functional safety**

1/4" 551 solenoid valve
AK7 DIN 19251 standard
SL4 IEC 61508 & IEC 61511 standards

**Clean/Aggressive environments**

All the exhaust ports are pipable for environment protection.
The spool valve’s internal volumes are channelled to the exhaust port avoiding corrosion risk in aggressive atmosphere.

“NAMUR STYLE” version: the spring-return chamber of the single-acting actuator “breathes” through the solenoid valve, isolating it from the outside atmosphere.
PILOT OPERATED SOLENOID VALVES
THREADED AND “NAMUR STYLE”

Product series 551, 552, 553
A unique range of 1/4”, 3/8”, 1/2” pilot operated solenoid valves for your pneumatic actuator applications.

- Small size and high flow rate up to 3800 l/min
- Threaded and “NAMUR style”
- Intrinsic safety version
- Fieldbus compatible
- Suitable for hazardous areas zones 0, 1, 2, 21, 22.

Our large range of solenoid operators, electrical power levels, valve materials, pilot interfaces, 3/2, 5/2 mono/bistable functions enable these valves to meet your needs for safety and low power consumption.

Threaded versions and “NAMUR STYLE” interface are in accordance with CEN/TC69/WG1/SG10, VDI/VDE3845 (NAMUR) standards.

Large range of solenoids

Various valve body materials

<table>
<thead>
<tr>
<th>Power levels</th>
<th>Ultra low power</th>
<th>Low power</th>
<th>Reduced power</th>
<th>Basic power</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.125W 0.003W</td>
<td>1.7W 0.4W</td>
<td>4W 3W</td>
<td>6.9W</td>
</tr>
</tbody>
</table>

Characteristics

Maximum operating pressure
10 bar

Operating temperature
-40°C to +80°C

Flow range
700 l/min to 3800 l/min

Electrical power level
To reduce the total cost of installation and to make the solenoids more reliable and suitable for fieldbus control, there is a strong trend towards lower power consumption.
3/2 DIRECT ACTING SOLENOID VALVES
UNIVERSAL OPERATION

The 1/4” direct acting solenoid valves Series 327 are recommended for pilot applications with *high flow*, wide pressure range and *no minimum operating pressure*.

The original balanced poppet construction combines low friction “Delta” seal and low power consumption.

![Image of solenoid valves]

**Functional safety**
AK7  DIN 19251 standard
SIL4  IEC 61508 & IEC 61511 standards

**TÜV**

**Characteristics**

- DN 5.7 mm
- Temperature range: -40°C to +120°C
- Brass, Stainless Steel executions
- Suitable for hazardous areas zones 1, 2
- Tamperproof manual reset
- Namur versions
- Redundant solenoid valves

**Power levels**

<table>
<thead>
<tr>
<th>Power levels</th>
<th>Reduced power</th>
<th>Medium power</th>
<th>Basic power</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.6 W</td>
<td>5.7 W</td>
<td>11.2 W</td>
<td></td>
</tr>
</tbody>
</table>

1. Energy saving: reduced power consumption thanks to low friction “Delta” seal
2. Reliability: balanced poppet technology assures resistance against pressure surges
3. Exceptional service life: Teflon rider and desulphurised seal eliminate sticking on valve seat

The original balanced poppet construction gives an equal pressure field all around the poppet and no pressure resistance during valve opening. This way the coil compensates only seal friction.
VALVE ISLANDS

Due to their increasing performances: flow versus size, easy installation, modular configuration, IP 65, I/O modules, spool valve islands are becoming more and more popular for process control applications.

In order to answer the different needs, ASCO/JOUCOMATIC has developed different island concepts.

**Modular concept**
- Mega
  - 900 l/min, ANR
  - 3/2, 2x 3/2, 5/2, 5/3 spool valves
  - Instant fittings
  - Individual connector IP 20/IP 65
  - Multipol, Profinet-IP, ASInterface
  - V.C.S. Valve Connection System
  - Up to 16 monostable or bistable spool valves
  - Air operated version

**Monobloc subbase concept**
- Generation C
  - 175 l/min, 600 l/min, 1050 l/min ANR
  - 3/2, 2x 3/2, 5/2, 5/3 spool valves
  - M5, G 1/8", G 1/4" or instant fittings

- ISO 1, 2 islands
  - 1400 l/min, 2800 l/min ANR
  - 5/2, 5/3 W1 W2 W3 spool valves
  - G 1/4", G 1/2"

- ISO 01 (VDMA G01) ISO 02 (VDMA G02) islands
  - 950 l/min, 500 l/min ANR
  - 5/2, 5/3 spool valves
  - G 1/4", G 1/8"

**Common characteristics**
- Multipol, Profinet-IP, Interbus-S, DeviceNet, ASInterface, Modbus, FIPIO
- Up to 16 monostable or bistable spool valves
- Up to 32 inputs and outputs per island (including spool valve outputs)

IP 20/IP 65 valve islands installed into a cabinet or directly into plant location.

Besides standard solutions, we have been developing customised islands for specific requirements for many years. For example, islands with intrinsically safe piezo pilot, isolation valves which act on the pneumatic circuit during operation, additional input/output modules, specific mounting plates, pressure switches ...
FUNCTIONAL SAFETY

Reliability is a critical factor in control and safety systems. Essential is our **compliance with functional safety IEC 61508 and 61511 standards.** ASCO/JOUCOMATIC pilot valves can easily perform millions of cycles, meaning in most cases they can outlive the rest of the customer’s process with zero maintenance. At the other end, pilot valves fitted to safety shut-off valves may operate only a handful of times during the plant life time. However, they must operate perfectly when required.

**Control systems**  
systems that control the installation under normal conditions.

**Safety systems**  
systems that bring the installation into a safe state in case of an emergency condition.

To determine whether a safety process loop fulfils a certain level, a calculation should be made using for each component in the loop the PFD (Probability of Failure on Demand) factors.

**Standards:**
- DIN 19250 & DIN 19251 standards. Classes AK 1 to 7
- IEC 61508 & IEC 61511 standards. Levels 1 to 4

**International approvals:**
The ability to serve various markets is further reflected in the whole gamut of agency approvals that ASCO/JOUCOMATIC has gained.

**International organisation:**
Global network with over 1000 sales offices and distributors. We have a thorough understanding of valves and their applications and are very much attuned to what is happening in all markets worldwide.

ISO 9000 companies including 20 manufacturing facilities.