

BR-MX26-00EN

# MOX

S E R I E S  
Proportional Control  
Valve with Pneumatic  
Actuator



FLOWMAX

[www.flowmaxi.com.tr](http://www.flowmaxi.com.tr)



# MOX 101

## Proportional Control Valve with Pneumatic Actuator

Flowmaxi MOX Series are pneumatic actuated valves developed for processes requiring high-precision proportional control. According to 4–20 mA or 0–10V signals, they proportionally regulate the fluid flow rate and provide stable response to process variations. With positioner technology offering millimetric precision, they accurately determine the opening/closing position of the valve. Flowmaxi branded positioners or IP converters ensure full compatibility with control systems. Thanks to their compact and modular design, they deliver high performance, low maintenance, and long service life.

### Domestic Production and Control Power

The MOX series operates seamlessly with Flowmaxi branded positioners and IP converters, as well as different analog and digital signal converters, ensuring full integration with existing automation systems. Thus, it provides long-lasting, fast, and stable control performance.

### Precise Proportional Control

According to process requirements, MOX series valves can operate with linear or equal percentage characteristics, providing high flow accuracy with a control deviation of  $\pm 1\%$ .

### Modularity and Service Convenience

MOX valves offer easy maintenance and short downtime with quick-disassembly structure and replaceable trim components. Process continuity is ensured thanks to the standard actuator connection.

### High Response and Safe Shut-Off

The pneumatic actuator quickly moves to a safe position in case of air supply interruption thanks to its rapid position change capability. With its spring-return (*fail-safe*) design, it offers NO (Normally Open) or NC (Normally Closed) configuration options.

# MOX 101

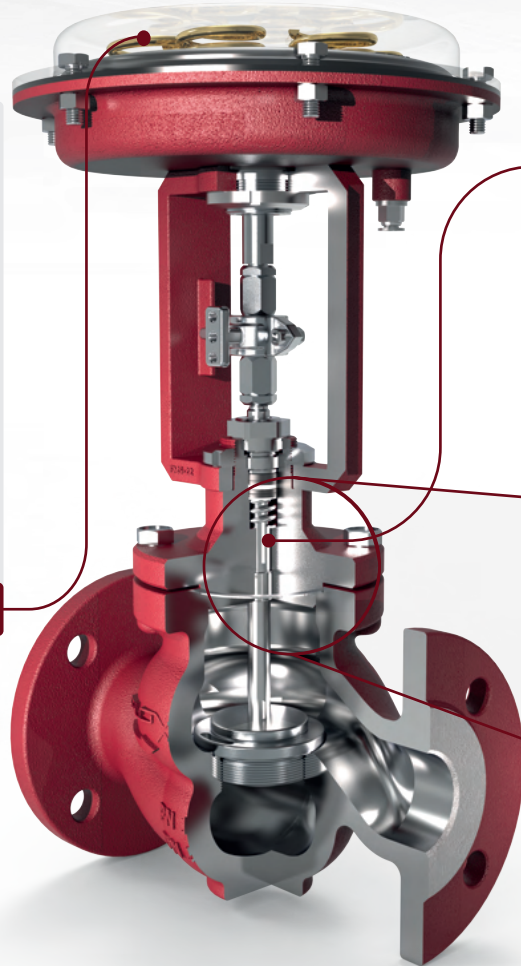
**Proportional Control  
Valve with Pneumatic  
Actuator**

## Multi-Spring Actuator Design for High Performance

The pneumatic actuators used in the MOX series provide high control stability thanks to their multi-spring diaphragm structure. Each spring is positioned to ensure optimum force distribution; thus, low hysteresis and high repeatability are achieved during position changes. With its fail-safe (*safe position on power loss*) feature, the valve remains in a safe position when the air supply is interrupted.

## V Packing

The spring-loaded V-type packing dynamically ensures sealing by creating continuous and balanced surface pressure around the shaft thanks to its formed structure. It provides resistance to wear in high-cycle applications and minimizes maintenance requirements.



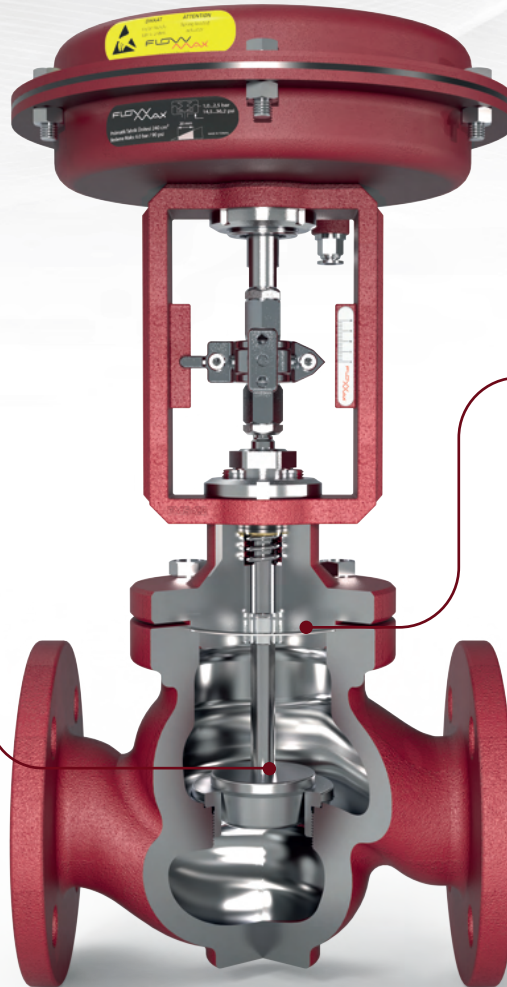
## Multifunctional, High-Performance Design

The form built on the S-type body of the MOX series guarantees optimum control and service life in compliance with international requirements. The robust body structure minimizes turbulence effects, thereby increasing the efficiency of your system.

# MOX 101

## Proportional Control Valve with Pneumatic Actuator

The MOX Series is a control valve specially developed for process applications requiring high precision in fluid control. Precisely machined seating surfaces provide sealing and high performance, enhancing process safety. Thanks to its interchangeable flow characteristics, the MOX series offers the control flexibility and durability required across many industries.



Thanks to stainless internal components with high resistance to wear and corrosion, maximum continuity is ensured in process operation.



**Steam Lines**  
For saturated or Zsuperheated steam lines.



**Heating-Cooling**  
In HVAC systems, boilers, and cooling towers.



**Process Lines**  
In chemical, petrochemical, food, and pharmaceutical processes.



**Compressed Air Systems**  
Compressor discharge and pre-regulation lines.



**Hot Water Systems**  
Heat transfer circuits and boiler return lines.



**Oil Circuits**  
Heated thermal oil or hydrocarbon lines.

# MOX 101-V

Proportional Control Valve  
with Pneumatic Actuator and  
Manual Handwheel



## Safe Control with Manual Override Capability

The handwheel model of the MOX Series offers the operator manual control capability in case of malfunction or automation system failure, in addition to the power of the pneumatic actuator. In this way, the valve position can be manually adjusted via the handwheel mechanism and the system can continue operating without interruption.

## Operational Continuity

In case of power outage or automation faults, the continuation of the process can be ensured through manual intervention via the handwheel.

## Dual Safety

MOX valves provide dual safety by enabling manual operation with the handwheel in case of pneumatic system failures.

## Backup Control in Emergency Situations

In cases of power or automation losses, intervention can be made without the need to completely shut down the facility.

## Ease of Maintenance and Commissioning

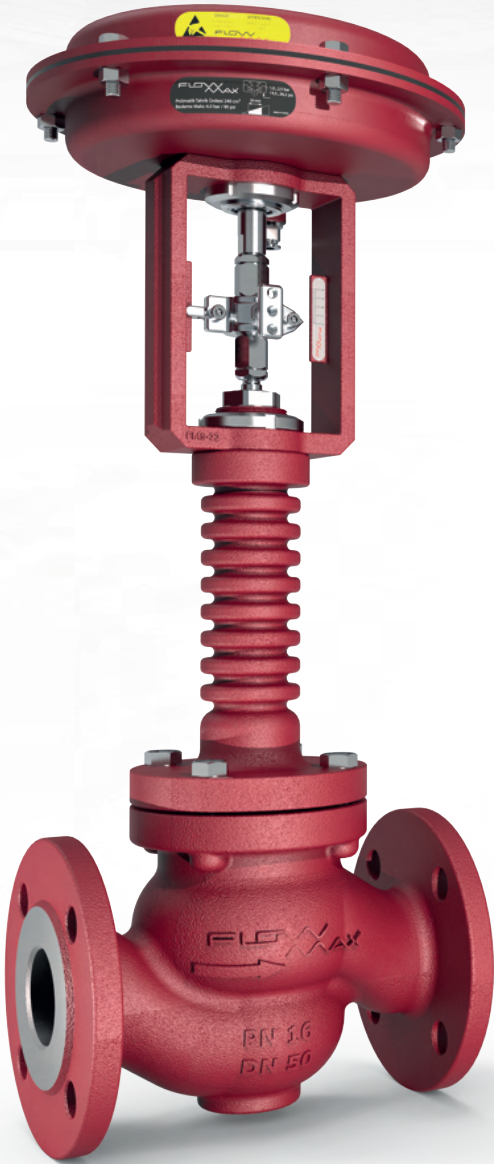
During initial commissioning or maintenance, the positioning of the valve can be performed conveniently.

## Reliable Manual Backup Solution for Critical Lines

The MOX Handwheel Series supports your engineering strength as a reliable manual backup solution, especially in processes requiring high safety and in critical lines.

# MOX 102

Proportional Control Valve  
with Pneumatic Actuator



## Special Design for High Temperature Applications

MOX 102 Series is developed for processes involving high temperatures and risks, such as thermal oil, superheated steam, and toxic gases. Thanks to its long stuffing box and special insulation structure, the actuator and packing components remain unaffected by high heat.

### Body and Material Structure:

It can be used safely in various fluids and processes such as steam, thermal oil, hot water, compressed air, and chemical fluids.

### Operating Temperature Range:

Geniş salmastra kutusu içerisinde çelik destekli grafit contalar veya metal körükler sayesinde sıfır dış kaçak sağlanır.

### Packing and Bellows Structure:

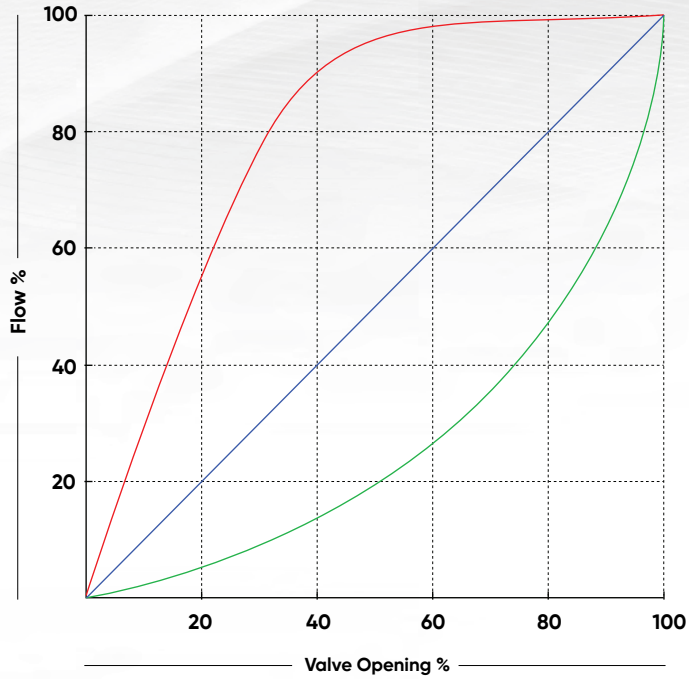
It prevents heat transfer between the process temperature and the actuator, extending the lifespan of the system components.

### Stable Positioning Even at High Temperatures

The cooling-effect body design minimizes thermal stresses by delaying high temperatures from reaching the actuator area, thereby extending the equipment's lifespan.

# MOX SERIES

## Flow Characteristic



Fast Opening  
Linear  
Equal Percentage

In control valves, the flow characteristic defines how the flow rate changes as the valve opening increases. In other words, it represents the flow curve corresponding to the opening percentage. Different characteristics are used according to application requirements.

### Flow Characteristic Types and Plug Designs:



#### 1. Equal Percentage

As the opening rate increases, the rate of flow change increases progressively. It provides precise control at initial positions and more aggressive flow in the final openings. It is especially preferred in processes with high pressure variations, and in steam and hot fluid applications.



#### 2. Linear

The increase in flow is directly proportional to the valve opening. It is ideal for systems less sensitive to pressure and for proportional heating-cooling applications.



#### 3. Fast Opening

A small valve movement allows a large portion of the flow to pass. It is commonly used in on/off applications and in systems requiring rapid response, such as safety and discharge lines.



#### 4. Noise-Reducing Cage Plug

Preferred in high differential pressure lines. It has a perforated structure that improves acoustic performance and reduces noise. It can be designed with linear or equal percentage flow characteristics. It provides a safe and durable solution against high pressure differences, cavitation, and vibration risks.

# MOX 300 SERIES

## 3 Way Pneumatic Actuated Proportional Control Valve

### Flowmaxi MOX Series 3 Way Proportional Control Valves

Specially designed to perform fluid mixing (*mixing type*) or diverting flow to two different directions (*diverting type*). These valves offer ideal solutions for applications requiring precise control of temperature, flow rate, and mixing ratios in process systems.



#### Superior Sealing Performance

Thanks to the double plug structure and precisely machined surfaces, sealing class is up to Class IV and Class VI. This minimizes energy losses.

#### Modular Body and Trim Structure

With easy maintenance and replaceable internal parts, it reduces both investment and operating costs.

#### Pneumatic Actuator Options

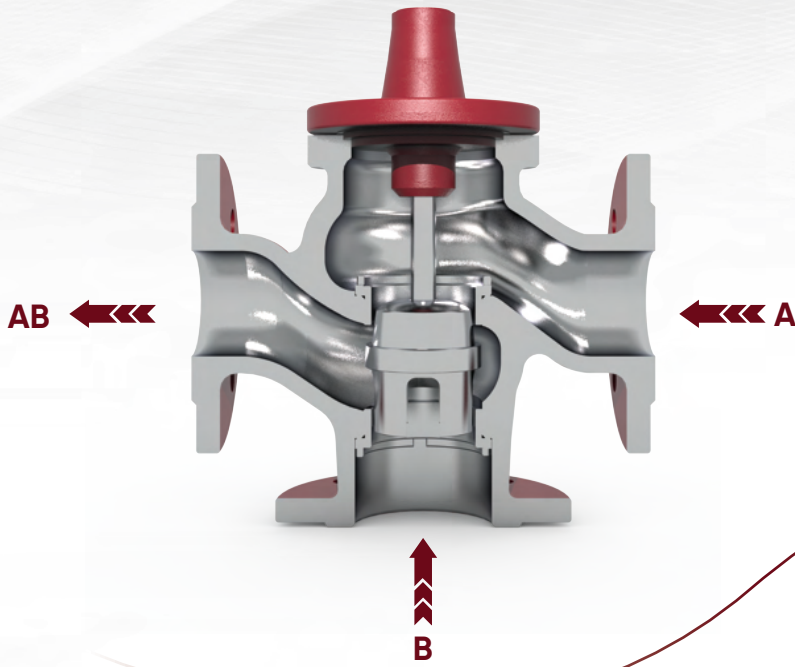
The powerful diaphragm actuator of the MOX series provides fast response time, fail-safe safety, and stable positioning over a wide stroke range.

#### Fluid Flexibility

Compatible with various fluids such as steam, hot water, thermal oil, and process fluids, with suitable material and sealing options available.

# MOX 300 SERIES

3 Way Pneumatic Actuated  
Proportional Control Valve

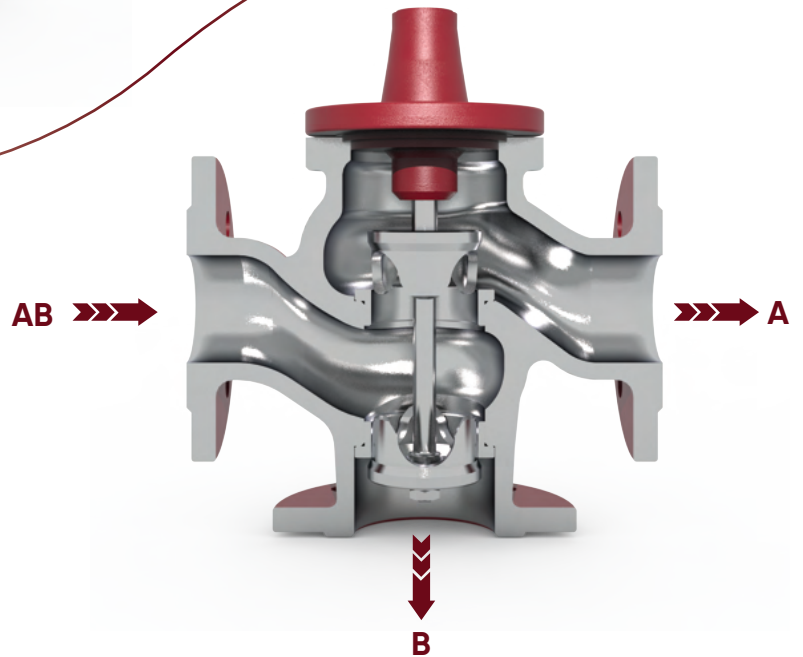


## Mixing Type

It enables the controlled combination of fluid coming from two different inlet lines into a single outlet line. It is especially suitable for heat exchangers and mixing processes.

## Diverting Type

It allows the fluid coming from a single inlet line to be proportionally distributed into two separate outlet lines. It is preferred in systems requiring cooling, heating, and flow direction control.



## Typical Application Areas



Proportional feed  
water systems for  
boilers



Temperature  
control  
applications



Energy recovery  
boiler systems



Mixing lines  
(chemical, food,  
pharmaceutical)



Inlet/outlet control  
of heat  
exchangers

## Equipment



### FM300 – Air Filter Regulator

Flowmaxi FM300 is a compact air filter regulator designed to provide clean and stable compressed air required for pneumatic control systems. Its high-performance 5-micron filter element ensures particle removal, while the precise regulator mechanism supports system stability.

- 5-micron filtration capacity
- 0–8 bar adjustable outlet pressure
- Automatic drain (*auto-drain*) option
- Maximum inlet pressure: 16 bar
- Easy installation with dual manometer connection
- Operating temperature range: -20°C to +70°C



### FM600 – Electropneumatic Positioner

Flowmaxi FM600 is an electropneumatic positioner operating with a 4–20 mA analog control signal, providing high positioning accuracy in MOX series control valves. With its durable structure suitable for harsh field conditions, it increases system reliability.

- Linear and fast positioning with 4–20 mA input signal
- Air supply: 1.4–7 bar / Compatible with double-acting and spring-return types
- Auto/Manual operating mode
- Compact design, IP66 protection class
- Fast commissioning and low hysteresis value
- Compatible connection interface with all standard pneumatic actuators



### FM800 – Smart Valve Positioner

Flowmaxi FM800 is a smart positioner designed for advanced control requirements, featuring a digital display and automatic calibration. With its high-resolution LCD screen, diagnostic functions, and HART protocol support, it integrates into industrial automation systems.

- 4–20 mA + HART communication protocol (*optional*)
- User-friendly LCD interface (*position display and parameter settings*)
- Automatic calibration (*Auto Tune*) and self-diagnostics
- Ex ia / Ex d certification options for hazardous areas
- IP66 protection class, operating range -30°C to +85°C
- Expandable structure with limit switch, position transmitter, and digital output modules



### FM700 – Digital Electro-Pneumatic Positioner with Display and Integrated Air Filter Regulator

The FM700 digital electro-pneumatic positioner precisely processes the 4–20 mA control signal received from the control system and regulates the air pressure supplied to the actuator, ensuring stable valve positioning. The digital display allows easy monitoring of the setpoint, actual valve position, and operating status. With its fast response characteristics, it delivers stable and repeatable performance. The integrated air filter regulator cleans and conditions the supply air, improving overall system reliability. An optional feedback function enables continuous valve position monitoring for advanced control applications.

- Digital display for easy monitoring and adjustment
- High positioning accuracy and repeatability
- Stable operation with minimized oscillation
- Integrated air filter regulator for clean and reliable air supply
- Optional feedback function for continuous position monitoring

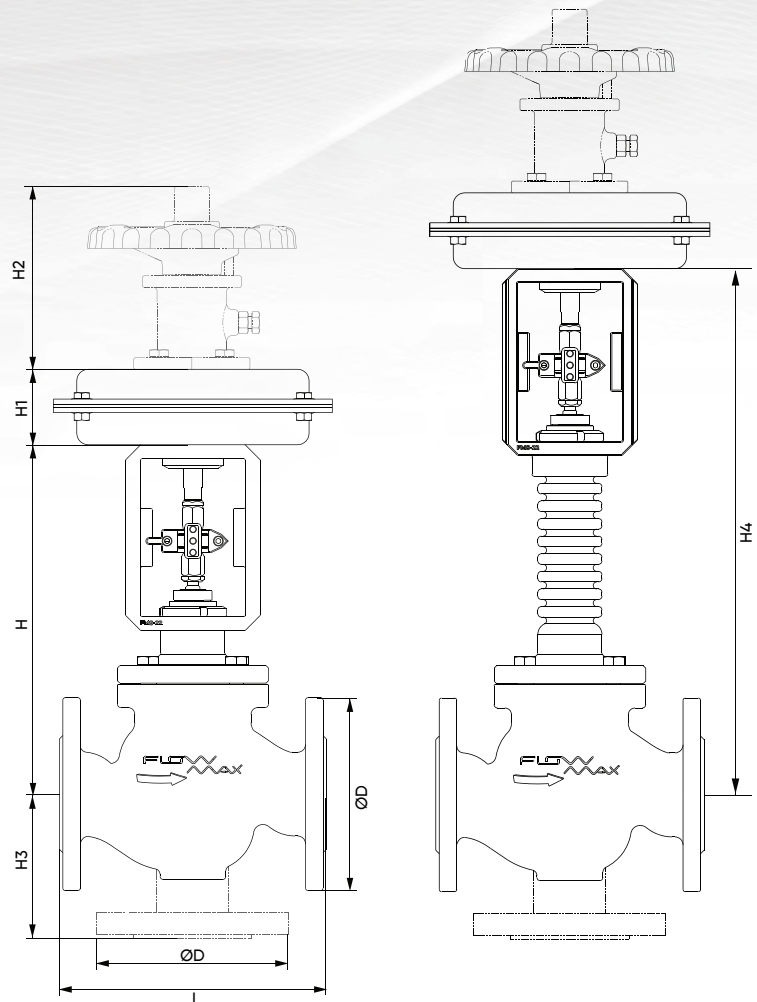
# MOX SERIES

## Pneumatic Actuated Proportional Control Valve

Flowmaxi MOX Series control valves offer flexible solutions for process requirements with nominal diameters ranging from DN15 to DN150 and different actuator sizes. They are designed to deliver maximum performance in industrial applications where temperature, pressure, and control precision are critical.

Body dimensions are determined in accordance with DIN EN 558-1 standards, and the connection flange, flange dimensions comply with PN16 standards. For high-temperature applications, long-travel designs can be selected, while more compact configurations are available for applications requiring shorter stroke. The MOX series offers a wide range of options in terms of actuator size and body height, enhancing engineering compatibility.

## Technical Details



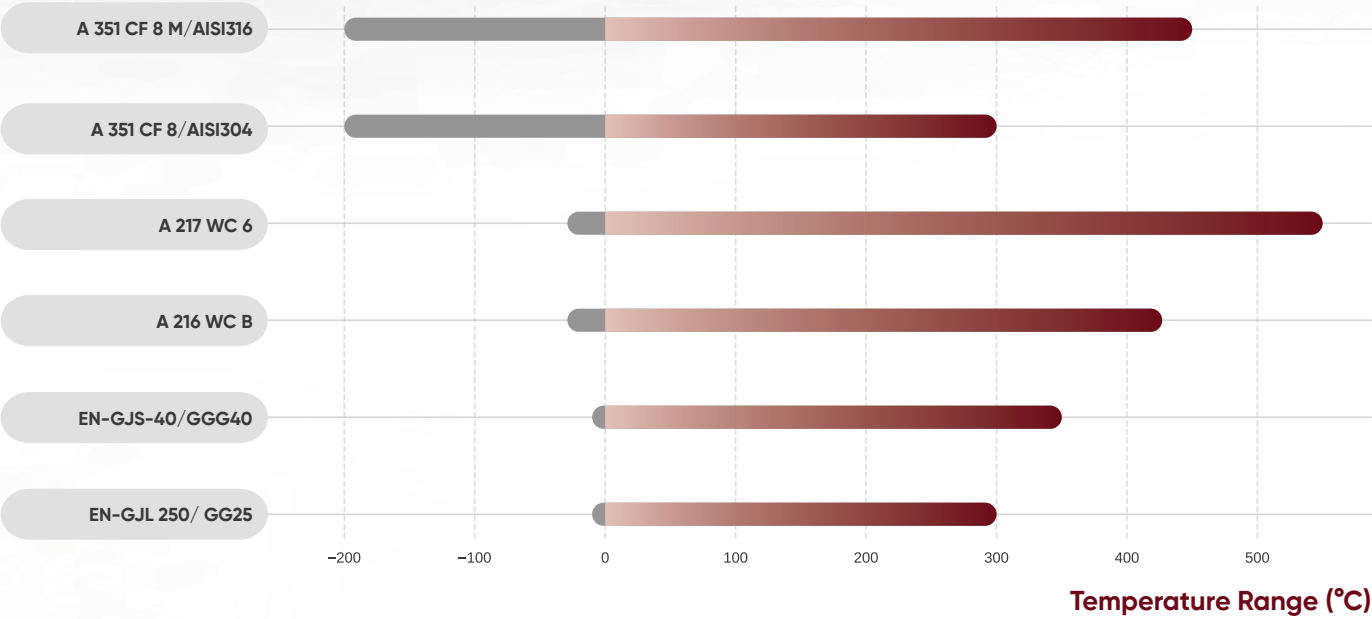
| Nominal Sizes | DN | 15  | 20  | 25  | 32  | 40  | 50  | 65  | 80  | 100 | 125 | 150 |
|---------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ØD            | mm | 95  | 105 | 115 | 140 | 150 | 165 | 185 | 200 | 220 | 250 | 285 |
| L             | mm | 130 | 150 | 160 | 180 | 200 | 230 | 290 | 310 | 350 | 400 | 480 |
| H             | mm | 275 |     |     | 280 | 290 | 300 | 310 | 320 | 370 | 580 | 590 |
| H1            | mm | 60  |     |     |     |     |     |     | 140 |     | 230 |     |
| H2            | mm | 160 |     |     |     |     |     |     | 200 |     | 250 |     |
| H3            | mm | 70  | 80  | 85  | 100 | 105 |     | 140 |     | 150 | 200 | 210 |
| H4            | mm | 395 |     |     | 400 | 410 | 420 | 430 | 440 | 490 | 700 | 710 |

Note: The dimensions above comply with EN 558-1 standards and are provided according to PN16 flange connection dimensions. The actuator height (H) may vary depending on the actuator size used. Accessories such as positioners and limit switches may increase the overall height. The specified technical data may vary depending on the valve body and trim structure. Custom sizing and dimensioning options are available upon request.

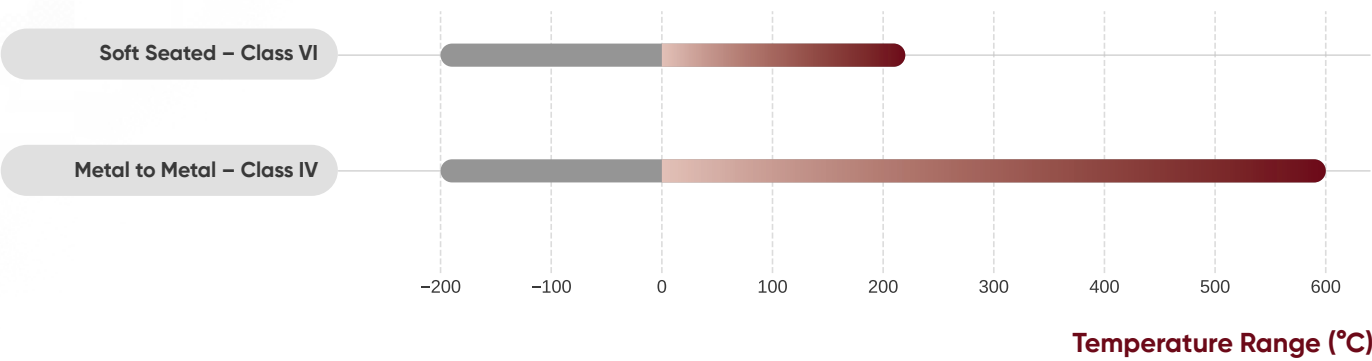
# MOX SERIES

## Operating Temperatures

### Operating Temperature Ranges by Body Material



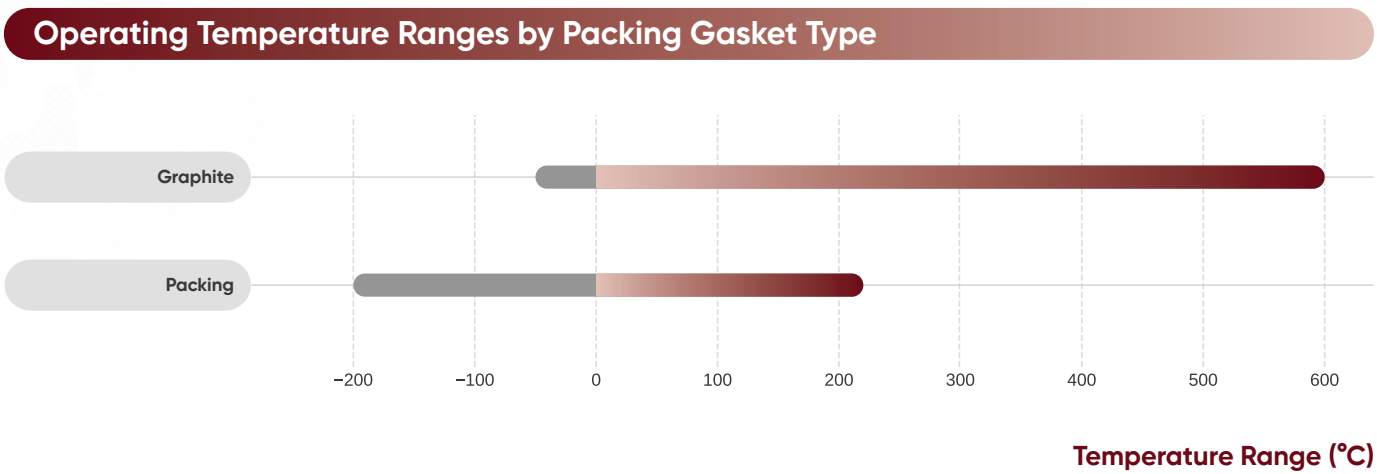
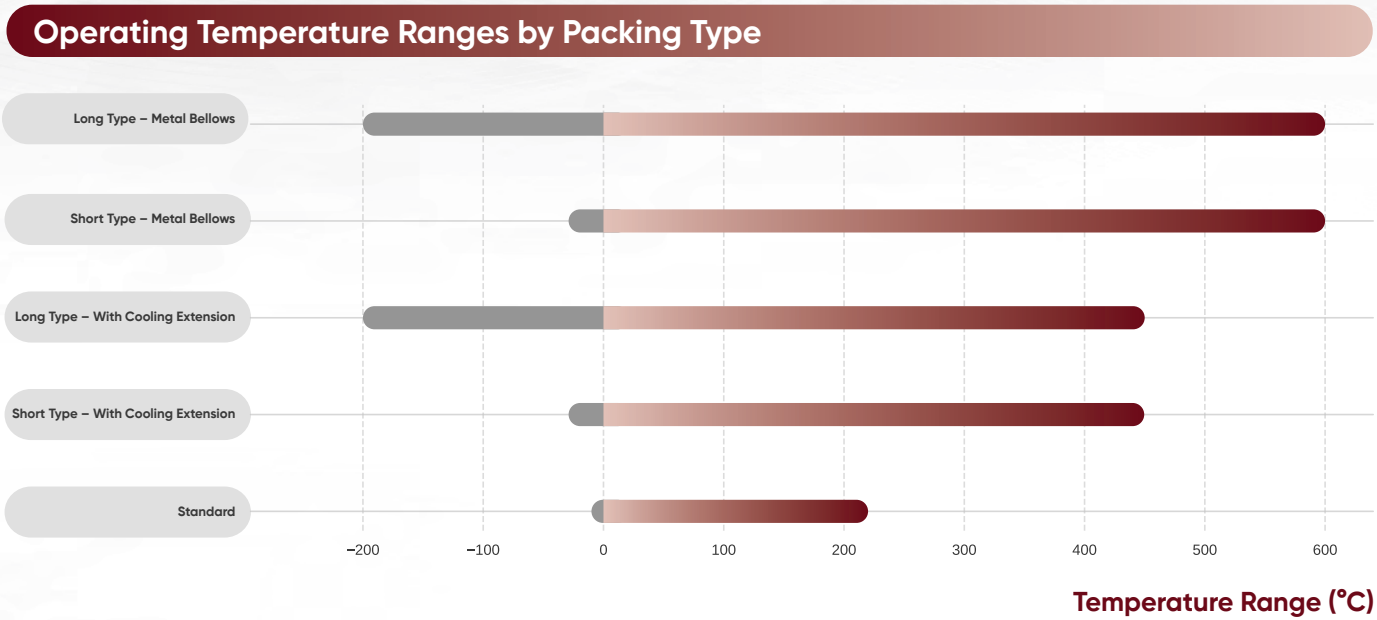
### Temperature Ranges by Seat–Plug Seal Type



# MOX

## S E R I E S

### Operating Temperatures



# MOX SERIES

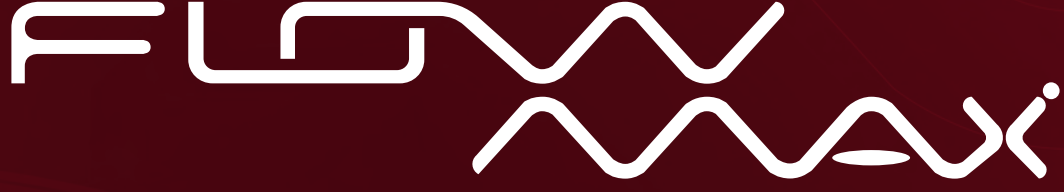
## Product Codes

| Section                           | Code Description                                        | Code Example |
|-----------------------------------|---------------------------------------------------------|--------------|
| Pressure Class                    | PN16<br>PN25<br>PN40                                    | PN16         |
| Nominal Diameter                  | DN...                                                   | DN50         |
| Type                              | MOX= Pneumatic Actuated Proportional Control Valve      | MOX          |
| Series                            | 1= 2 way<br>3= 3 way                                    | 1            |
| Flow Characteristic               | 0= Equal Percentage<br>1= Linear<br>2= Quick Opening    | 0            |
| Packing Size                      | 1 = Short Type Packing<br>2 = Long Type Cooling Packing | 1            |
| Flow Type<br>(for MOX 300 Series) | N= Blank<br>D= Diverting Type<br>M= Mixing Type         | N            |
| Manual Handwheel                  | N= Blank<br>V= With Handwheel                           | V            |
| Leakage Class                     | 4 = Class IV (Metal-Metal)<br>6 = Class VI (PTFE)       | 6            |
| Filter Regulator                  | 0= No<br>1= Yes                                         | 1            |
| Positioner                        | 0= No<br>1= FM600<br>2= FM800                           | 2            |
| Control Signal                    | 1= 4-20mA<br>2= 0-10V                                   | 1            |
| Fail Position                     | NO= Normally Open<br>NC= Normally Closed                | NC           |

### Coding Example

|      |      |     |   |   |   |   |   |   |   |   |   |    |
|------|------|-----|---|---|---|---|---|---|---|---|---|----|
| PN16 | DN50 | MOX | 1 | 0 | 1 | N | V | 6 | 1 | 2 | 1 | NC |
|------|------|-----|---|---|---|---|---|---|---|---|---|----|

| SATURATED STEAM TABLE |         |             |                                 |                              |                      |                      |
|-----------------------|---------|-------------|---------------------------------|------------------------------|----------------------|----------------------|
| Pressure              |         | Temperature | Specific Enthalpy               |                              |                      | Specific Volume      |
| [bar g]               | [bar a] | [bar a]     | Saturated Water (hf)<br>[kJ/kg] | Evaporation (hfg)<br>[kJ/kg] | Steam(hg)<br>[kJ/kg] | [m <sup>3</sup> /kg] |
| 0                     | 1,013   | 100         | 419,1                           | 2256,6                       | 2675,7               | 1,674                |
| 0,2                   | 1,213   | 105,2       | 440,76                          | 2243                         | 2687,3               | 1,414                |
| 0,4                   | 1,413   | 109,6       | 459,68                          | 2231                         | 2690,7               | 1,226                |
| 0,6                   | 1,613   | 113,7       | 476,53                          | 2220,19                      | 2696,7               | 1,083                |
| 0,8                   | 1,813   | 117,3       | 491,7                           | 2210,2                       | 2702                 | 0,971                |
| 1                     | 2,013   | 120,4       | 505,7                           | 2201,1                       | 2706,9               | 0,88                 |
| 1,5                   | 2,513   | 127,8       | 536,2                           | 2180,9                       | 2717                 | 0,715                |
| 2                     | 3,013   | 133,8       | 562,3                           | 2163,3                       | 2725,5               | 0,603                |
| 2,5                   | 3,513   | 139         | 585                             | 2147,7                       | 2732,6               | 0,523                |
| 3                     | 4,013   | 143,9       | 605,3                           | 2133,5                       | 2738,7               | 0,461                |
| 3,5                   | 4,513   | 148         | 623,5                           | 2120,3                       | 2743,9               | 0,413                |
| 4                     | 5,013   | 152         | 640,7                           | 2108,1                       | 2748,7               | 0,374                |
| 4,5                   | 5,513   | 155,6       | 656,3                           | 2096,7                       | 2753                 | 0,342                |
| 5                     | 6,013   | 158,9       | 670,9                           | 2086                         | 2756,9               | 0,315                |
| 6                     | 7,013   | 165,1       | 697,5                           | 2066                         | 2763,5               | 0,272                |
| 7                     | 8,013   | 170,6       | 721,4                           | 2047,7                       | 2769,1               | 0,240                |
| 8                     | 9,013   | 175,5       | 743,1                           | 2030,9                       | 2774                 | 0,215                |
| 9                     | 10,013  | 178         | 763                             | 2015,1                       | 2778,1               | 0,194                |
| 10                    | 11,013  | 184,2       | 781,6                           | 2000                         | 2781,7               | 0,177                |
| 11                    | 12,013  | 188         | 798,8                           | 1986                         | 2784,8               | 0,163                |
| 12                    | 13,013  | 191,6       | 815                             | 1972,5                       | 2787,6               | 0,151                |
| 13                    | 14,013  | 195,3       | 830,4                           | 1959,6                       | 2790                 | 0,141                |
| 14                    | 15,013  | 198,4       | 845,1                           | 1947,1                       | 2792,2               | 0,132                |
| 15                    | 16,013  | 201,5       | 859                             | 1935                         | 2794,1               | 0,124                |
| 16                    | 17,013  | 204,5       | 872,3                           | 1923,4                       | 2795,7               | 0,117                |
| 17                    | 18,013  | 207         | 885                             | 1912,1                       | 2797,1               | 0,110                |
| 18                    | 19,013  | 210         | 897,2                           | 1901,3                       | 2798,5               | 0,105                |
| 19                    | 20,013  | 212,5       | 909                             | 1890,4                       | 2799,5               | 0,100                |
| 20                    | 21,013  | 215         | 920,3                           | 1880,2                       | 2800,5               | 0,095                |
| 21                    | 22,013  | 217,3       | 931,3                           | 1870,1                       | 2801,5               | 0,091                |
| 22                    | 23,013  | 219,5       | 942                             | 1860                         | 2802                 | 0,087                |
| 23                    | 24,013  | 221,8       | 952,2                           | 1850,3                       | 2802,8               | 0,083                |
| 24                    | 25,013  | 224         | 962,2                           | 1840,9                       | 2803,1               | 0,079                |
| 25                    | 26,013  | 226,1       | 972,1                           | 1831,4                       | 2803,5               | 0,076                |
| 30                    | 31,013  | 235,7       | 1017                            | 1787                         | 2804,1               | 0,064                |
| 35                    | 36,013  | 244,2       | 1057,8                          | 1745,5                       | 2803,1               | 0,055                |
| 40                    | 41,013  | 252         | 1094,6                          | 1706,3                       | 2800,8               | 0,048                |
| 45                    | 46,013  | 258,8       | 1228,7                          | 1669                         | 2797,6               | 0,0431               |
| 50                    | 51,013  | 265         | 1160,9                          | 1632,8                       | 2793,6               | 0,038                |



Maximum Safety in Flow Control!

Fevzi Çakmak Mah. 10576. Sk. NO:13/M Karatay/**KONYA/TÜRKİYE**

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"Flowmaxi reserves the right to make changes to product specifications without prior notice."

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