SG

SANAYE GAZ IRAN

# THE AXIAL FLOW VALVES

## SERIES Class 300/600

SANAYE GAZ IRAN

## Company Profile

**SANAYE GAZ IRAN** MFG Co. was founded in 1980.
Since then, it has been in production of high quality domestic and industrial Gas Regulators and Gas Meters. Over the past three decades, through innovation and constant strive for excellence and quality, its annual production has increased from 56,000 to over 500,000 units.

The organization has always maintained quality while providing a continuous improvment of before and after sale customer service as its goal.
Over 200 highly qualified and experienced engineers and technicians are employed by S.G. in Qazvin, Iran.

## Quality Policy

**SANAYE GAZ IRAN is manufacturer of high quality products and services to its customers.**
**This is ensured through corrective and preventive actions along with continuous improvements of the effectiveness of the quality system.**

## The Axial Flow Valves Descriprion

The Axial Flow Valve is an industry standard for pressure regulation in distribution and transmission applications.
SANAYE GAZ IRAN offers a full range of Axial Flow Valve regulators up to Class 600 applications and sizes from 2" up to 8".
The regulator is pilot controlled. Sanaye Gaz Iran can provide a full range of supporting controls.

The design of the Axial Flow Valve means that it can be used in a wide range of applications. A simple change of sleeve upgrades the axial flow valve from one pressure range to another. A change of control will convert the axial from pressure to volumetric control or to monitor override, or safety control.

The **simplicity** of the Axial Flow Valve makes maintenance easy. Whilst no special tools are strictly required.

Fully interchangeable and reversible components in addition to wafer design construction, ensure that the axial flow valve is simple to install,remove and maintain.

The only spares required for each valve size are a single sleeve and three 'O'-rings.

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## Axial Flow Valve Main Parts

> (1) INTERCHANGEABLE VALVE CAGE CLOSURE

> (2) VALVE CAGE CLOSURE

> (3) VALVE BODY

> (4) RUBBER SLEEVE

(1) (2) (3) (4)

The heart of the Axial Flow Valve is the unique 'V' form flexible sleeve. This is the only moving part. Throttling and control is performed by the sleeve expanding and contracting in relation to the inlet and outlet slotted cages which fit inside the sleeve and are formed to match the 'V' configuration. An outer cylindrical body surrounds the cage and sleeve assembly forming a 'V' shaped cavity all around the sleeve. All four parts are held together with a single bolt through the centre of the cages. Control is achieved by modulating the pressure in the cavity at the back of the sleeve.

## How It Works

With gas supply pressure at the back of the sleeve equal to inlet pressure, the sleeve is closed against the inlet cage. A closing force equal to inlet pressure acts on the downstream 'V' sleeve area forcing it against the downstream cage to provide double closure and a completely tight seal.

The pressure at the back of the sleeve creates a pressure imbalance across the sleeve, inlet pressure now being higher. This expands the sleeve away from the cages thereby allowing flow from inlet to outlet. The pressure at the back of the sleeve can now be referred to as the 'Control' Pressure.

Reducing the control pressure further increases the differential across the sleeve allowing it to expand further until the sleeve is flat against the body for 100% capacity. The position of the sleeve, and therefore flow, is controlled by the pressure at the back of the sleeve.

## Maintenance

Under normal operation conditions, the axial flow valve is capable of long-term service operation.
Amongst different parts of the equipment, sleeves are most exposed to severe conditions like fluid impurities and are most recommended to be replaced regularly.
Sanaye Gaz Iran recommendation for optimum operation intervals is 18 months.
The procedure to replace the sleeves is given in steps shown in pictures below:


(1)


(2)


(3)


(4)


(5)


(6)


(7)


(8)


(9)


(10)


(11)


(12)

## Storage

Idealy Axial flow valves should be stored in original shipping boxes.
Plastic bags may also be used and will prevent foreign materials from entering the valve passage.
When removing an axial flow valve from service it is recommended that the valve be throughly cleaned and inspected prior to storage.

**SLEEVES** should be kept out of direct sunlight and away from contaminants, radiation and Ozone producing electrical equipment.
Temperature above 35°C are to be avoided.
Sleeves should be stored in polyethylene bags inside a box.

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# Capacity Tables - Class 300 - ISA METHOD - (SCMH)

**Gas Specific Gravity 0.6 Base Pressure: 14.73 psig Temperature: 15.5° C**

## 2" Class 300

Cv=66.5 Fp=1.00 Fg=1.291 Xt=0.590 Fk=0.929

| Inlet Pressure (psig) | Outlet Pressure (psig) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 0 | 10 | 20 | 30 | 50 | 75 | 100 | 150 | 200 |
| 15 | 2110 | 1586 | | | | | | | |
| 30 | 3200 | 3143 | 2650 | | | | | | |
| 60 | 5352 | 5352 | 5352 | 5182 | 3653 | | | | |
| 125 | 9996 | 9996 | 9996 | 9996 | 9996 | 9486 | 7646 | | |
| 250 | 18944 | 18944 | 18944 | 18944 | 18944 | 18944 | 18944 | 18180 | 14753 |

## 3" Class 300

Cv=135 Fp=1.00 Fg=1.291 Xt=0.490 Fk=0.929

| Inlet Pressure (psig) | Outlet Pressure (psig) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 0 | 10 | 20 | 30 | 50 | 75 | 100 | 150 | 200 |
| 15 | 3936 | 3143 | | | | | | | |
| 30 | 5918 | 5918 | 5210 | | | | | | |
| 60 | 9883 | 9883 | 9883 | 9826 | 7249 | | | | |
| 125 | 18491 | 18491 | 18491 | 18491 | 18491 | 18151 | 15121 | | |
| 250 | 35056 | 35056 | 35056 | 35056 | 35056 | 35056 | 35056 | 34632 | 29167 |

## 4" Class 300

Cg=231 Fp=1.00 Fg=1.291 Xt=0.480 Fk=0.929

| Inlet Pressure (psig) | Outlet Pressure (psig) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 0 | 10 | 20 | 30 | 50 | 75 | 100 | 150 | 200 |
| 15 | 6654 | 5380 | | | | | | | |
| 30 | 10024 | 10024 | 8863 | | | | | | |
| 60 | 16764 | 16764 | 16764 | 16679 | 12403 | | | | |
| 125 | 31347 | 31347 | 31347 | 31347 | 31347 | 30837 | 25797 | | |
| 250 | 59381 | 59381 | 59381 | 59381 | 59381 | 59381 | 59381 | 58786 | 49753 |

## 6" Class 300

Cg=325 Fp=1.00 Fg=1.291 Xt=0.495 Fk=0.929

| Inlet Pressure (psig) | Outlet Pressure (psig) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 0 | 10 | 20 | 30 | 50 | 75 | 100 | 150 | 200 |
| 15 | 9515 | 7589 | | | | | | | |
| 30 | 14328 | 14328 | 12544 | | | | | | |
| 60 | 23956 | 23956 | 23956 | 23786 | 17500 | | | | |
| 125 | 44769 | 44769 | 44769 | 44769 | 44769 | 43863 | 36444 | | |
| 250 | 84838 | 84838 | 84838 | 84838 | 84838 | 84838 | 84838 | 83705 | 70368 |

## 8" Class 300

Cg=560 Fp=1.00 Fg=1.291 Xt=0.450 Fk=0.929

| Inlet Pressure (psig) | Outlet Pressure (psig) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 0 | 10 | 20 | 30 | 50 | 75 | 100 | 150 | 200 |
| 15 | 15659 | 12884 | | | | | | | |
| 30 | 23560 | 23560 | 21209 | | | | | | |
| 60 | 39332 | 39332 | 39332 | 39332 | 29818 | | | | |
| 125 | 73568 | 73568 | 73568 | 73568 | 73568 | 72916 | 61873 | | |
| 250 | 139348 | 139348 | 139348 | 139348 | 139348 | 139348 | 139348 | 138782 | 119300 |

* See Note

# Capacity Tables - Class 600 - ISA METHOD - (SCMH)

**Gas Specific Gravity 0.6 Base Pressure: 14.73 psig Temperature: 15.5° C**

## 2" Class 600

Cv=67.6 Fp=1.00 Fg=1.291 Xt=0.590 Fk=0.929

| Inlet Pressure (psig) | Outlet Pressure (psig) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 0 | 100 | 200 | 300 | 500 | 700 | 900 | 1100 | 1300 |
| 250 | 19256 | 19256 | 15008 | 0 | 0 | 0 | 0 | 0 | 0 |
| 400 | 30186 | 30186 | 29988 | 25599 | 0 | 0 | 0 | 0 | 0 |
| 600 | 44741 | 44741 | 44741 | 44486 | 32933 | 0 | 0 | 0 | 0 |
| 1000 | 73822 | 73822 | 73822 | 73822 | 73511 | 66687 | 44146 | 0 | 0 |
| 1400 | 102932 | 102932 | 102932 | 102932 | 102932 | 102508 | 97297 | 83620 | 53066 |

## 4" Class 600

Cv=248 Fp=1.00 Fg=1.291 Xt=0.590 Fk=0.929

| Inlet Pressure (psig) | Outlet Pressure (psig) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 0 | 100 | 200 | 300 | 500 | 700 | 900 | 1100 | 1300 |
| 250 | 70679 | 70679 | 55048 | 0 | 0 | 0 | 0 | 0 | 0 |
| 400 | 110719 | 110719 | 110040 | 93956 | 0 | 0 | 0 | 0 | 0 |
| 600 | 164097 | 164097 | 164097 | 163248 | 120800 | 0 | 0 | 0 | 0 |
| 1000 | 270880 | 270880 | 270880 | 270880 | 269663 | 244659 | 161917 | 0 | 0 |
| 1400 | 377664 | 377664 | 377664 | 377664 | 377664 | 376078 | 356964 | 306815 | 194623 |

## 6" Class 600

Cg=500 Fp=1.00 Fg=1.291 Xt=0.511 Fk=0.929

| Inlet Pressure (psig) | Outlet Pressure (psig) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 0 | 100 | 200 | 300 | 500 | 700 | 900 | 1100 | 1300 |
| 250 | 132609 | 132609 | 108766 | 0 | 0 | 0 | 0 | 0 | 0 |
| 400 | 207734 | 207734 | 207734 | 184400 | 0 | 0 | 0 | 0 | 0 |
| 600 | 307891 | 307891 | 307891 | 307891 | 239392 | 0 | 0 | 0 | 0 |
| 1000 | 508234 | 508234 | 508234 | 508234 | 508234 | 476547 | 323210 | 0 | 0 |
| 1400 | 708605 | 708605 | 708605 | 708605 | 708605 | 708605 | 689207 | 604398 | 389670 |

## 8" Class 600

Cv=710 Fp=1.00 Fg=1.291 Xt=0.550 Fk=0.929

| Inlet Pressure (psig) | Outlet Pressure (psig) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 0 | 100 | 200 | 300 | 500 | 700 | 900 | 1100 | 1300 |
| 250 | 195331 | 195331 | 156140 | 0 | 0 | 0 | 0 | 0 | 0 |
| 400 | 306022 | 306022 | 305512 | 265642 | 0 | 0 | 0 | 0 | 0 |
| 600 | 453582 | 453582 | 453582 | 453015 | 343060 | 0 | 0 | 0 | 0 |
| 1000 | 748730 | 748730 | 748730 | 748730 | 626627 | 689292 | 461397 | 0 | 0 |
| 1400 | 1043906 | 1043906 | 1043906 | 1043906 | 1043906 | 1043000 | 1001601 | 868907 | 555381 |

**NOTE:** The capacities shown in this bulletin are the maximum capacities of the valve only in the full open condition.
Actual capacities of the valve in the regulating or relief mode are a function of the pilot employed, the restrictor setting, the downstream piping, and the gas velocity. Good engineering practice suggests sizing the load below the maximum capacity of the valve.
Recommended sizing is 50% to 80% of maximum capacity.

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