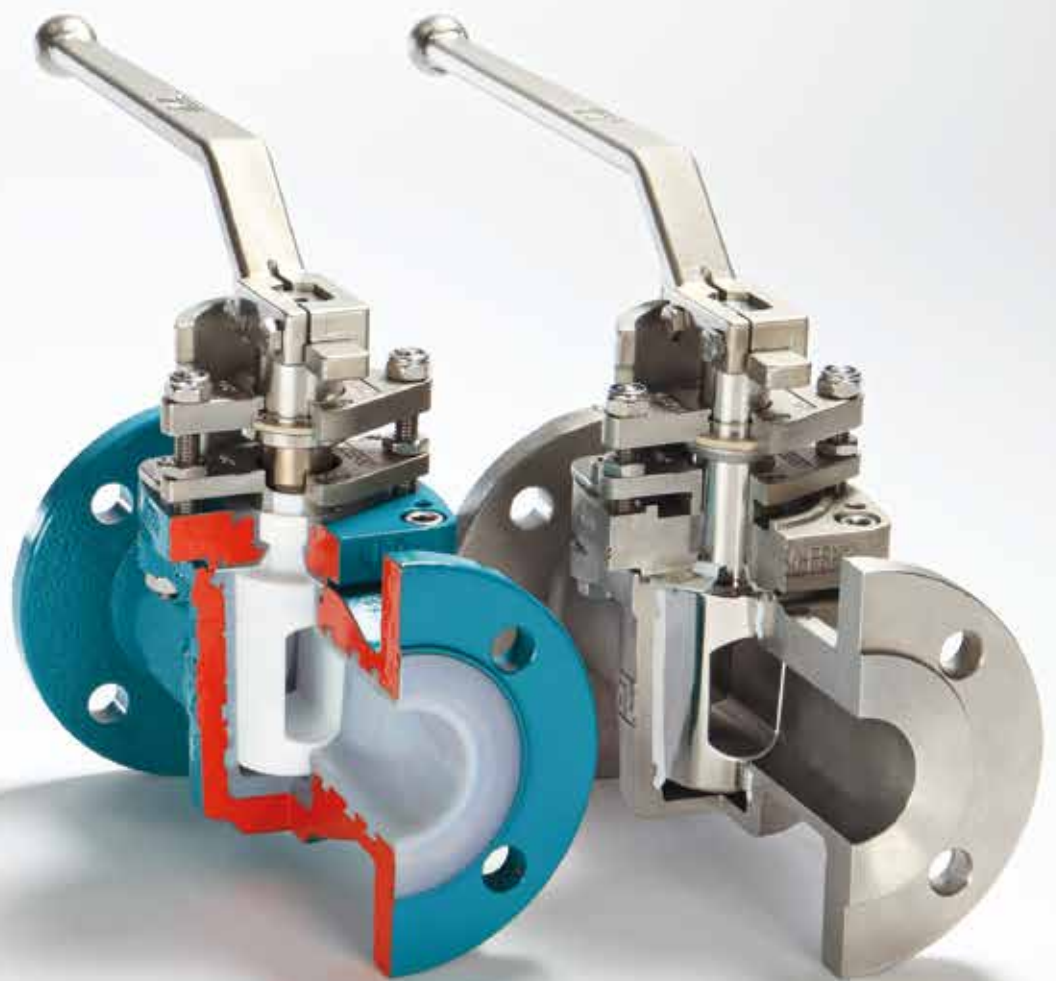


Valves for highest demands!
Reliable and tight for years!



More than 50 years' experience and competence as solution provider

Headquarter Germany
Moenchweiler (Black Forest)



**AZ Armaturen is an international enterprise with
4 production locations and
2 own foundries**

More than 50 years of experience in design and production of soft seated plug valves with PTFE sleeves makes AZ an international partner in terms of valve design and customized solutions. The high vertical integration from R&D, own casting and sleeve production, over machining to final assembly and testing, guarantees compliance with all common quality standards.

AZ plug valves are designed to meet various applications in the chemical, petrochemical, pharmaceutical, food production, pulp & paper, nuclear power and many other industries.

Worldwide AZ employs over 450 people in its various plants, foundry operations and service locations.

Plant Brazil
Itatiba (São Paulo)



Plant China
Taicang (Shanghai)



Plant South Africa
Boksburg (Johannesburg)





AZ foundries – competence right from the beginning reactive – flexible – quick



Foundry Gatter, Germany
Schwäbisch Gmünd (Stuttgart)



AZF Foundry, Brazil
Itatiba (São Paulo)

Sand casting
specialized in stainless steel
from 0.5 to 6,000 kg (pumps&valves)
and to 12,000 kg (full-mold casting)



Gatter Edelstahlguss
Germany, Schwäbisch Gmünd -
Stuttgart

Own foundry capacities guarantees
high quality and short delivery times:

- **Competence:** Many years of experience and know-how for valves and materials
- **Quick:** Own modeling and tool construction

Precision casting
specialized in lost wax technique
from 0.01 to 50 kg

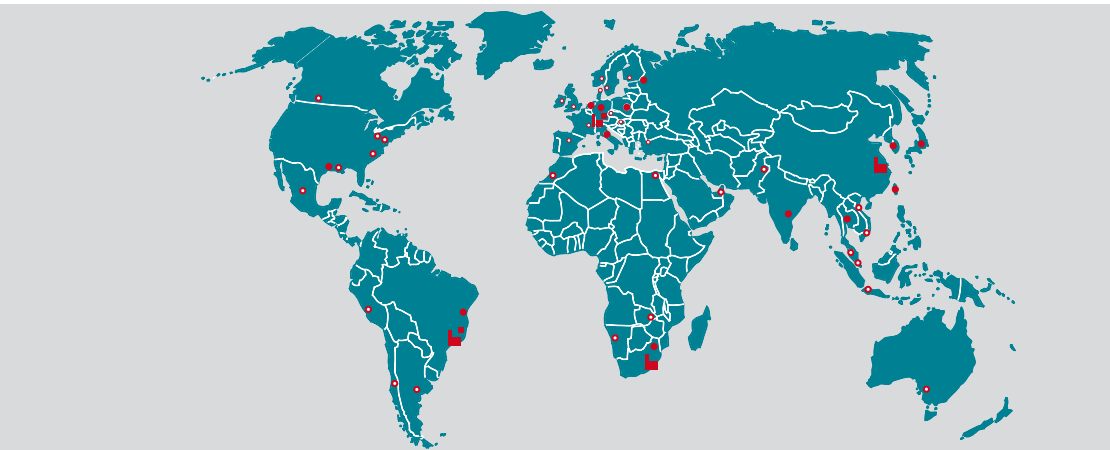


AZF Foundry
Brazil, Itatiba - São Paulo

- **Flexibility:** Several production lines and melting furnaces for single or serial production
- **Reactive:** Short decision-making and direct contact



AZ service centres customer focus worldwide



In addition to various production facilities, we maintain a worldwide net of service locations

Special valves are a valuable resource and require individual service. The service locations ensure comprehensive technical consultation for customers. Standard valves, actuators and accessories are in stock and available. Modifications, new configurations or repairs can be performed in short time.

We are always close to the customers with more than sixteen of our own worldwide service centres:

Europe

- Germany (Moenchweiler & Rhineland)
- Great Britain (Manchester)
- Italy (Milan/Caltignaga)
- Poland (Warsaw/Opoczno)
- The Netherlands (Amsterdam/Lisse)
- Russia (St. Petersburg)

America

- USA (Houston/TX)
- Brazil (São Paulo/Itatiba & Belem)
- Chile (Santiago de Chile)
- Peru (Lima)

Asia

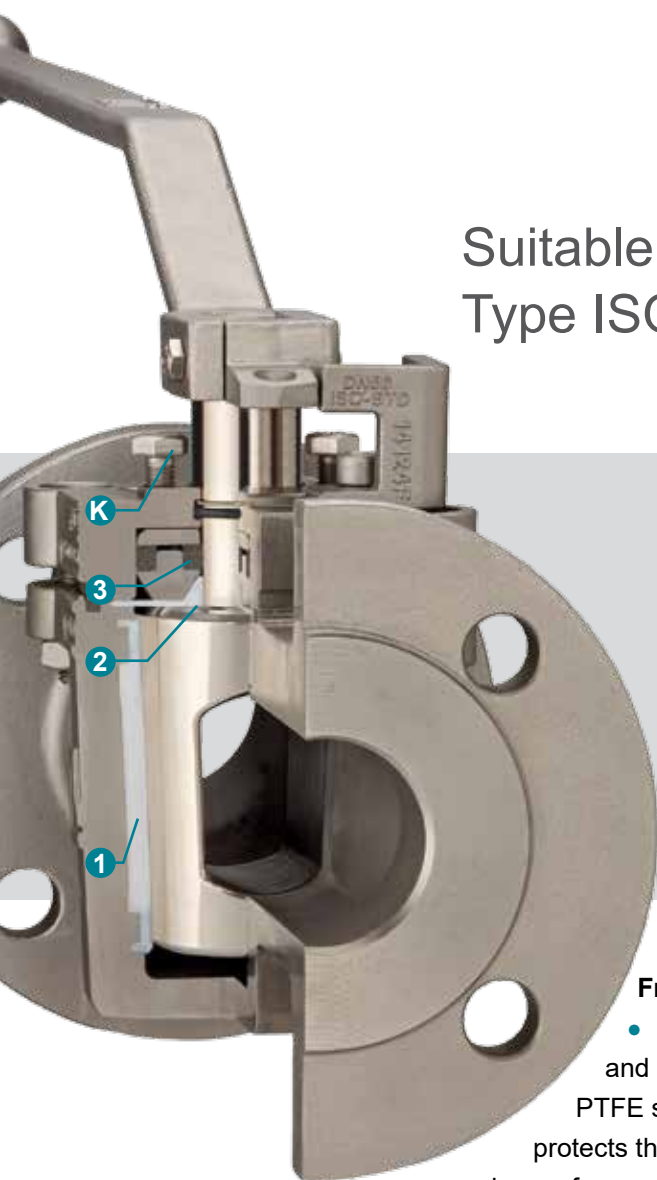
- China (Taicang)
- Singapore
- Thailand (Nonthaburi)
- Vietnam (Hanoi)

Africa

- South Africa (Johannesburg&Durban)



Suitable for major applications: Type ISO-STANDARD



AZ plug valves - free of cavities!

Fire safe design, type FS (optional standard sealing type STD or chemistry sealing type CA)

- 1 Primary sealing: PTFE sleeve
- 2 Secondary sealing: V-diaphragm with Delta thrust collar
- 3 Tertiary sealing: stem packing (Graphite optional)
- K Plug adjustment

$T_{\max} = 230^{\circ}\text{C}$

Free of Cavities

- the self-lubricating and chemical-resistant PTFE sleeve covers and protects the entire plug. Sealing surfaces remain dry and do not come into contact with medium
- maintenance free
- very long lifetime
- reliable and tight for years

PTFE chambering

- due to perfect and complete chambering, twisting or cold-flow of the sleeve is eliminated

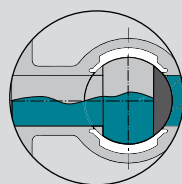
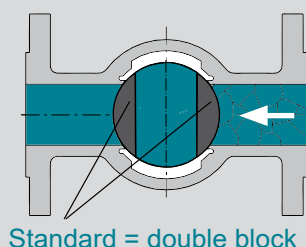
Vacuum-tight

- all plug valves are vacuum-tight, also at minimal or no differential pressure, the plug valves are absolutely tight

Technical comparison

PTFE-sleeved AZ plug

- free of cavities

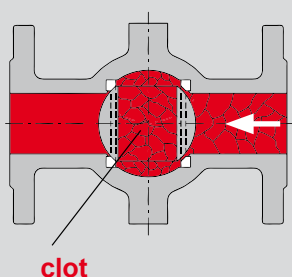


Crystallizing and polymerizing media

- no danger for the seal or ease of the plug
- media cannot collect or remain due to an absence of cavities

Ball valve with 2 PTFE sealing rings

- floating ball
- cavities



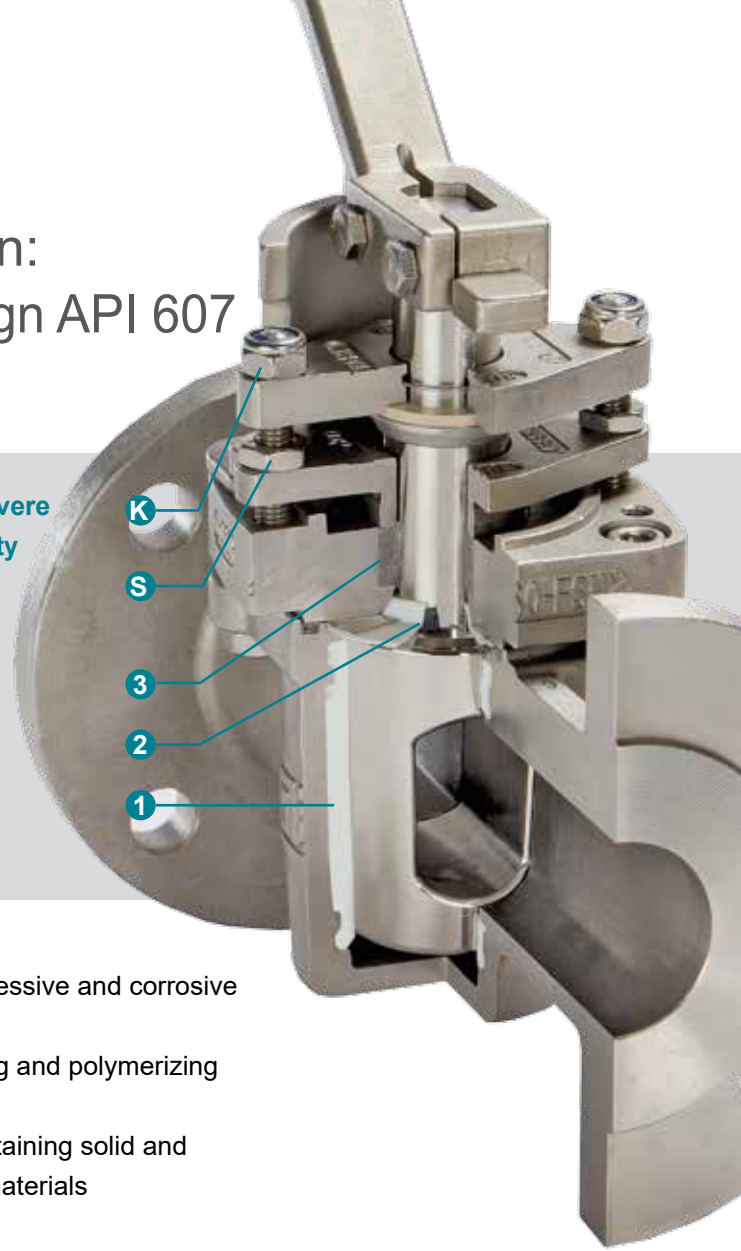
- clot formation in the cavities
- ball cannot be turned or can only be turned with difficulty
- damage to sealing ring/blockade
- increase of torque due to one-sided pressure when ball is floating

The high performance solution: Type ISO-FSN, Fire-Safe-Design API 607 with triple stem packing

Free of cavity AZ plug valves with safety sealing for severe applications. For fluctuating temperatures with triple safety stem packing

- 1 Primary sealing: PTFE sleeve (Graphite optional)
- 2 Secondary sealing: V-diaphragm with Delta thrust collar
- 3 Tertiary sealing: Triple safety stem packing (Graphite)
- K Plug adjustment
- S stuffing box adjustment

$T_{max} = 280^{\circ}\text{C}$ (Graphite, P-sleeve)



Sealing systems

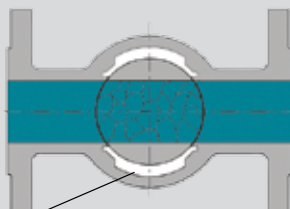
- High performance valves for fluctuating temperatures
Type CASN: $T_{max} 230^{\circ}\text{C}$ (PTFE)
Type FSN: $T_{max} 280^{\circ}\text{C}$ (Graphite)
- toxic, aggressive and corrosive chemicals
- crystallizing and polymerizing media
- media containing solid and abrasive materials

Adjustable

- the conical plug can quickly and easily be adjusted during operation for tight shut off!

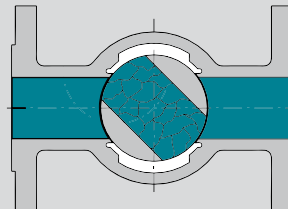
AZ valves are suitable for

Aggressive media



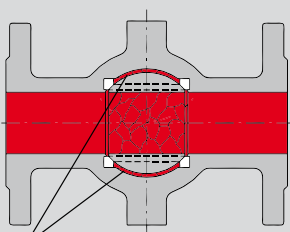
free of cavities

- polished sealing surface of the plug is completely covered by the PTFE sleeve and thus protected from aggressive media



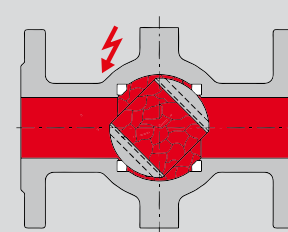
Solid materials in the media

- sealing sleeve encloses and protects the whole plug
- no damage to sealing sleeve due to absence of contact surface



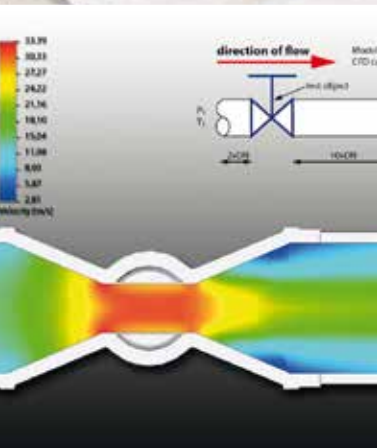
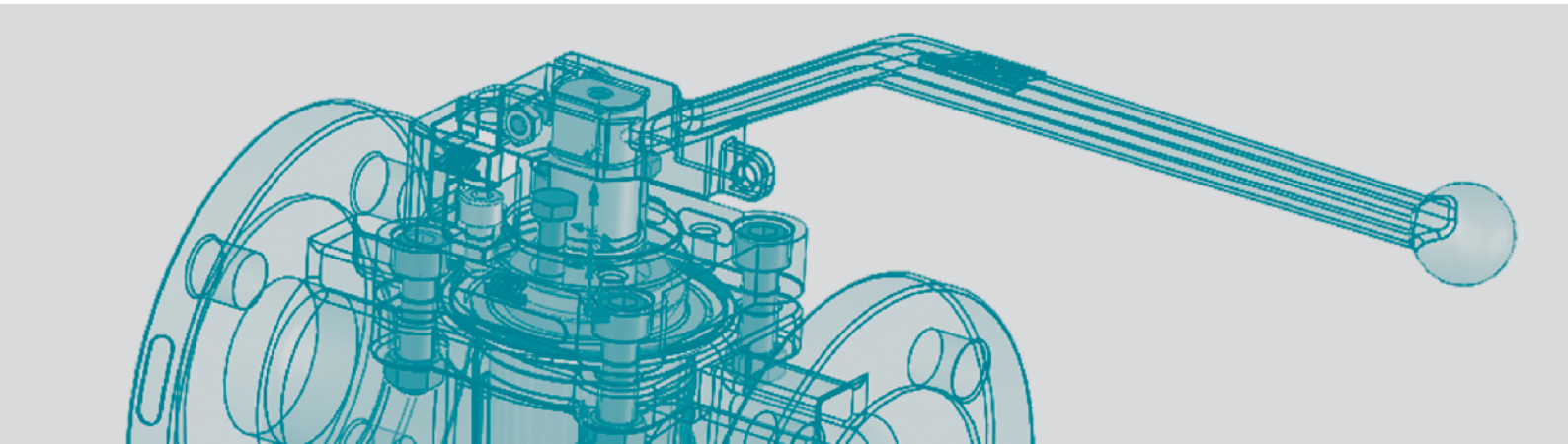
cavities

- ball sealing surfaces are completely and permanently exposed to aggressive media and can be damaged



- sealing rings can easily be damaged!

High expertise and professional advice ensures high quality customized products



A global network of professional experts will answer all technical questions. Extensive experience and technical knowledge are required for customized special valves

- **p** Pressure
- **T** Temperature
- **M** Media
- **A** Aggregate state
- Safety standards
- Test certificates
- Standards

These values together with the implementation conditions are the basis for further selection of valve material, sealing system and the valve configuration.

Each order, with its challenges to technology, material, seal and quality certificates, is handled individually by an experienced team from planning until delivery.

Standard materials body

- Ductile Iron ASTM A395, EN-GJS-400-18 (GGG 40.3)
- Carbon Steel ASTM A216 WCB, 1.0619 (GS-C 25)
- Stainless Steel ASTM A351 CF8M, 1.4408

Standard materials plug

- Stainless Steel ASTM A351 CF8M, 1.4408
- Stainless Steel ASTM A351 CF8
- 1.4308

Special materials body/plug

- Hastelloy B / C
- Inconel / Monel
- Nickel
- Zirconium
- Titanium / Tantalum
- Duplex
- Super Duplex
- other on request

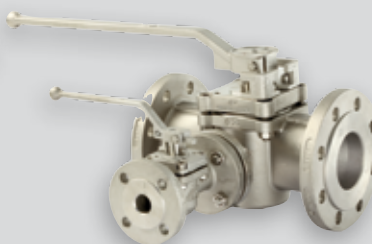
Plug valves for highest demands



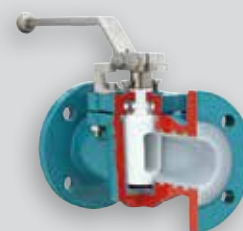
Two-way up to five-way plug valve



Heating jacketed plug valves with different connections



Plug valves with flushing device



Plug valves with chemical-resistant FEP/PFA lining

As the PTFE-sleeved AZ plug valves are free of cavities and very durable, they can be used in many industrial production plants



Chemical and petrochemical industry

Plug valves and sampling systems for aggressive, toxic, crystallising and polymerising media (e.g. PVC, HCE, H_2SO_4 , PP, PE, acetic acid, melamine applications, TDI/MDI production processes etc.)



Refineries

Plug valves for HF-Alkylation, heating jacketed valves for bitumen, sulphur, sulphuric acid and for sulphur recovery



Pulp and paper industry

Plug valves for H_2O_2 , chlorine and sulphuric acid applications



Ship building

Plug valves for heavy oil and diesel applications



Fertilizer industry

Plug valves for ammonia and urea applications, ammonium nitrate, nitrogen, nitric acid



Food industry / Pharmaceutical industry

Inner polished plug valves with flushing devices, pharmaceutical CIP resistant, FDA compliant



Sea water desalination

High pressure plug valves made of Duplex or Superduplex for reverse osmosis processes



Production plants

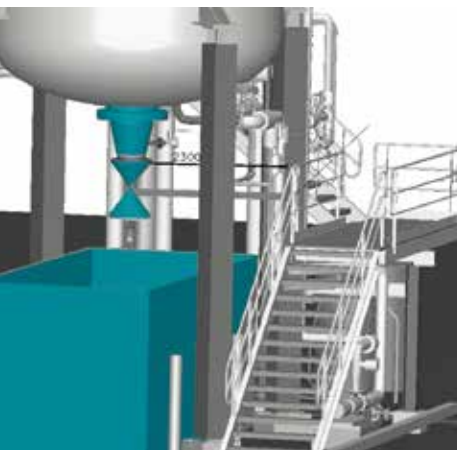
Plug valves for control applications. 4-way plug valve for absorption-airdryer systems



Power plants

Plug valves for fossil and nuclear plants (primary and secondary circuits, cooling circular or flue gas desulphurization)

Customized solutions:
the highest added value for our customers!



Examples:



Type ISO EXTRA

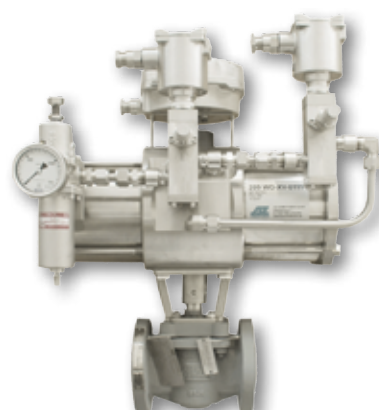
- full bore plug valve 18"
- AZ design for fast acting actuator <12 sec
- main valve, actuator and control valves for ambient temperatures of -52°C to 140°C (-62°F to 284°F)

Type ISO-STANDARD

- plug valve, actuator and control valves completely made of stainless steel
- PST type (partial-stroke-test)

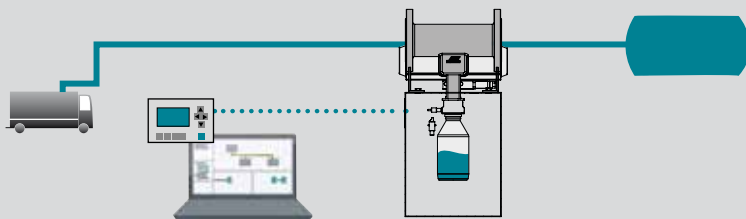
Special valves

- a special flange, pressure transmitters with large diaphragm surface guarantees precise measurement
- 3 measurement devices can be installed on the valve



Type CONTIFLOW PLC

- Safe programmable and automatic sampling in a protecting box
- Inline-system for process, loading, resp. unloading applications



Type CONTIFLOW + SP

- cavity free sampling system with flushing valve - completely automatized



Type VARIO

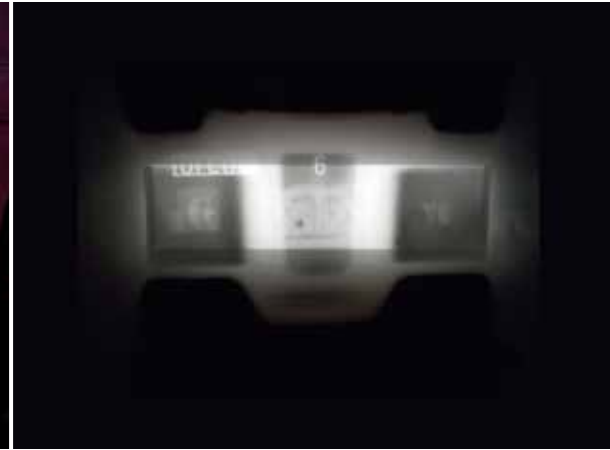
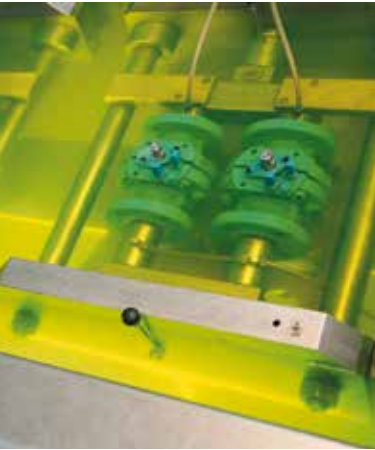
- insulated cabinet sampling system with integrated heating system
- sample quantity 500 ml
- with nitrogen flushing



Type BW-3-STANDARD

- 3-way plug valve with weld-ends
- manual emergency gear box
- actuator with air buffer tank

Active quality management: analyzing, documenting, certifying



AZ has the necessary certificates and meets the highest customer requirements. A wide range of test equipment, extensive test and internal inspections assure the highest quality throughout the whole production process

Non destructive tests in our own AZ labs

- Positive material identification (PMI) / Spectral analysis
- Dye penetrant test acc. to ASME Section V / DIN EN 571
- 100% tightness testing acc. to API 598 / ASME 16.34
- X-ray tests acc. to ASTM A446
- Helium leakage test acc. to DN EN 15848, TA-Luft, leak rate 10^{-6} mbar/s (< 10 ppm)
- High voltage test acc. to ISO 2746 (15.000 volt) for lined valves
- High pressure leakage test with water and gas to PN 160/240 bar

Additional inspections by third party

- Lloyds Register / Bureau Veritas
- TÜV / DEKRA

- Intertek / Moody

Quality Management and ongoing production controls

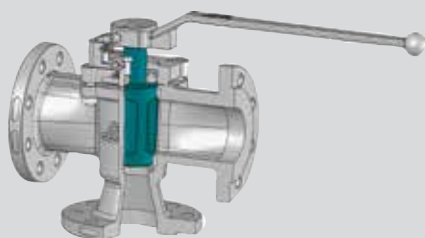
- TÜV approved welders (MIG, MAG and WVG)
- 3D-CAD computer-aided design with CFD computational fluid dynamics
- Layer and wall thickness testing
- Oil-free / grease-free testing with UV light
- CNC manufacturing for maximum accuracy

Certificates:

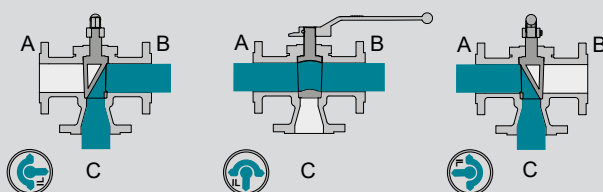
- ISO 9001
- DGRL 2014/68/EU
- Firesafe API 607 / ISO 10497
- TA-Luft
- HP 0 / TRD 201
- Tü-AGG
- SIL (Safety Integrity Level)
- TR.TS (GOST-R)
- DVGW - approval
- Test certificates for material, function and seal



PTFE-sleeved plug valves from 2 to 7 way



- Standard plug valves up to DN 600/24" with a wide range of plugs
- Two-way up to seven-way plug valves
- Seven way plug valve with plug type "L"
- optional with heating jacket or flushing device



Two way plug valves with ISO bracket flange for actuator mounting

F-2 ISO - STANDARD

- DN 15 - 600 / PN 10 - 40
- NPS ½ - 24 / class 150 - 300



Three way plug valves vertical / horizontal with ISO bracket flange for actuator mounting

F-3 ISO - STANDARD

- DN 15 - 600 / PN 10 - 40
- NPS ½ - 24 / class 150 - 300



Four and five way plug valves with ISO bracket flange for actuator mounting

F-4 / F-5 ISO - STANDARD

- DN 15 - 600 / PN 10 - 40
- NPS ½ - 24 / class 150 - 300



Plug valves full bore design with ISO bracket flange for actuator mounting

ISO-EXTRA

- DN 15 - 600 / PN 10 - 100
- NPS ½ - 24 / class 150 - 600



Plug valves with heating jacket (cast design!)

fully jacketed design, type HM
partial jacketed design, type TM

- DN 15 - 600 / PN 10 - 100
- NPS ½ - 24 / class 150 - 600

Plug valves with flushing device

SP / DKS

- for media which tends to stick, harden, crystallise or polymerise



Plug valves with welded ends

SW / BW / RO

- DN 15 - 600 / PN 10 - 100
- NPS ½ - 24 / class 150 - 600



Screwed plug valves (cast design) with ISO bracket flange

MG

- screwed ½ " - 3", WHITWORTH pipe thread DIN ISO 228/1 and DIN2999
- NPT pipe thread ANSI B1.20.1 other on request
- various pipe threads and tube fittings



Instrumentation plug valves

MGZ / MBZ / MB / WA / VINTAGE

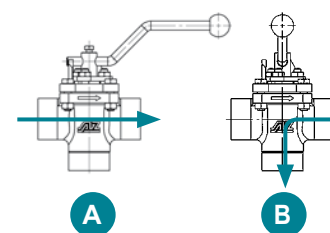
- screwed ¼ " - 2", WHITWORTH pipe thread DIN ISO 228/1 and DIN2999
- NPT pipe thread ANSI B1.20.1, other on request
- various pipe threads and tube fittings



Special plug valve for safe flushing of pipe systems

BMH

- for safe flushing of the pipe system (A = position 0°)
- easy depressurizing of the flushing hose (B = position 90°)
- space-saving design, defined plug position



Manometer plug valve

FM 100

- for pressure gauges and instrument leads
- safe-guarded ventilation for the pressure relief of the manometer
- DIN-EN: DN 15 – 25 / PN 10 – 160, ASME: NPS ½ – 1 / class 150 – 900



Water supply plug valves

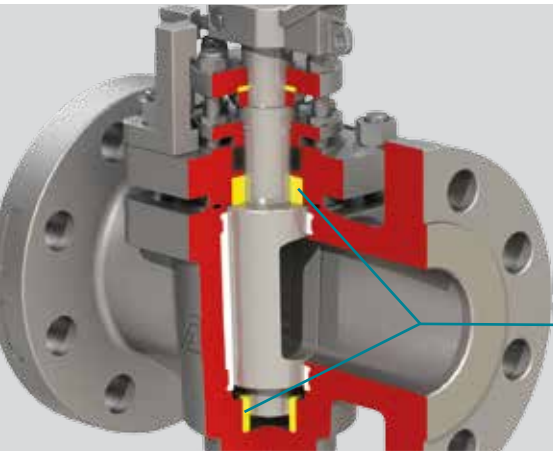
AQUA

- DIN-EN: DN 40 / PN 16



HIGH PERFORMANCE

PTFE-sleeved plug valves for special applications



- fugitive emission design for aggressive and toxic media
- safety sealing for fluctuating temperatures:
type FSN (Graphite packing, T_{max} 280°C/540°F) or
type CASN (PTFE packing, T_{max} 230°C/450°F)
- Fire-Safe-Design (API 607)
- optional in high pressure design

Type HDS: High pressure plug valve with double bearing for plug



Two way plug valve for fluctuating temperatures

F - 2 ISO-FSN / F - 2 ISO-CASN

- DN 15 - 600 / PN 10 - 40
- NPS ½ - 24 / class 150 - 300



Plug valves, high pressure design

HDS

- DN 15 - 600 / PN 100 - 160
- NPS ½ - 24 / class 600 - 900



Two way plug valves made of high quality Monel material, UOP approved

ISO-FS-HF / ISO-FSN-HF

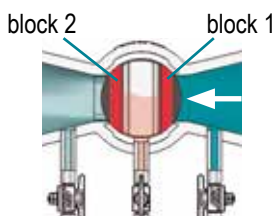
- Special design for HF alkylation
- ASME: NPS ½ - 24 / class 300



High pressure plug valves for nuclear facilities

NUCLEAR

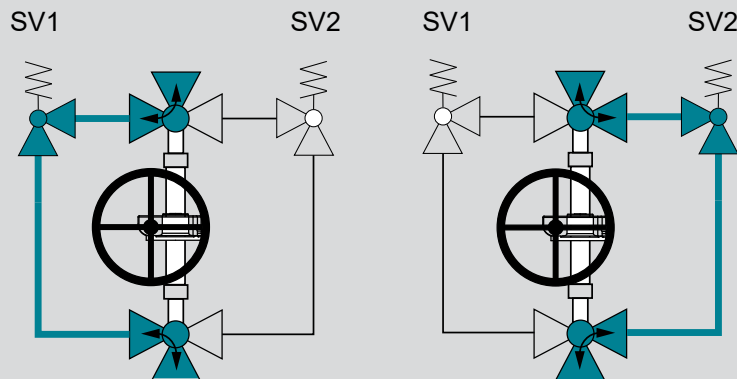
- high pressure design, forged steel
- replacement of sleeve with installed valve
- nuclear approval



Plug valves with Double Block & Bleed/Inspection

DBI

- DIN-EN: DN 15 - 600 / PN 10 - 40
- ASME: NPS ½ - 24 / class 150 - 300



- Crossover-Valve-Combinations for safety valves or
- for no interruption of circular flow

Crossover valve combinations

UK

- all types of AZ valves combinable
- for cooling and heating cycles or reactor cycles
- for replacement or cleaning of filter systems



Special cross-over combinations for safety (relief) valves SAVA

- full-flow, round bore
- operation errors impossible design-wise
- safe back-flow of blow off capacity with cross-over combination
- reliable an tight for years - free of cavities



Type SAVA
cross-over single valve



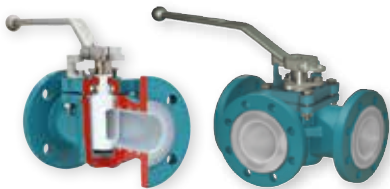
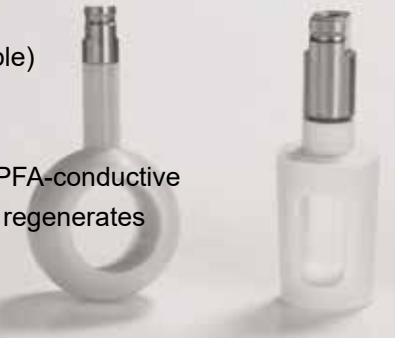
Type SAVA
cross-over valve combination

Plug valves and ball valves with chemical-resistant FEP/PFA lining

NEW!

Type CASN-A fugitive emission design with chemical safety sealing system

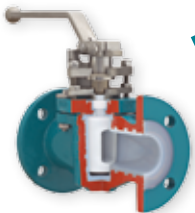
- fluctuating temperatures
- PTFE triple safety stem packing (adjustable)
- FEP/PFA lined cover
- different lining materials: FEP, PFA, PFA-conductive
- fresh granulate used, no refurbished regenerates
- locked in lining, vacuum-proof
- minimum thickness of lining ≥ 3 mm



Plug valve two-way or three-way, with ISO bracket flange for actuator mounting

ISO-STANDARD-A

- DN 15 - 300 / PN 10 - 40
- NPS ½ - 12 / class 150 - 300

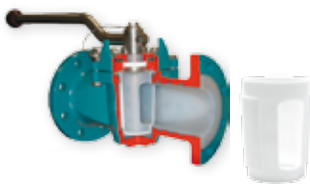


NEW!

For severe service applications that require a sealing system of higher integrity

ISO-CASN-A with safety stem packing

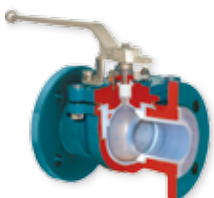
- DN 15 - 300 / PN 10 - 40
- NPS ½ - 12 / class 150 - 300



Plug valves with exchangeable PTFE sleeve, with ISO bracket flange for actuator mounting

AB 2000

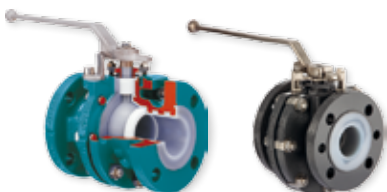
- DN 15 - 300 / PN 10 - 40
- NPS ½ - 12 / class 150 - 300



Ball valves, one-piece durable body (top entry)

MONOBLOC / NVN

- DN 15 - 200 / PN 10 - 25
- NPS ½ - 8" / class 150



Ball valves, two piece body NVN

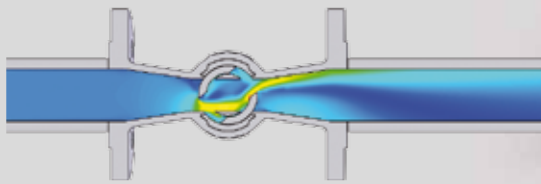
Ball valve and bottom outlet valve (short pattern) NEO-VAL / KA

- DIN-EN: DN 15 - 200 / PN 10 - 25
- NPS ½ - 8 / class 150

Control plug valves

PTFE sleeved or FEP/PFA lined

- valves with standard K_{vs} values or individual control characteristics
- optional with internal protection insert (Type RH-S)
- cost-effective automation
- free passage possible with open valve
- tight shut off in closed position



Plug type PR
equal percentage



Plug type LR (A)
linear



Plug type LR
linear

Control valves with equal percentage or linear characteristic control

RH, RH-S, RH-A

- DN 15 - 450 / PN 10 - 40 - 63 - 100
- NPS ½ - 18 / class 150 - 300 - 600



Piping accessories

metallic or with FEP/PFA lining

Ball check valves with or without sight-glass

GLOBUS, DELTA, MRV

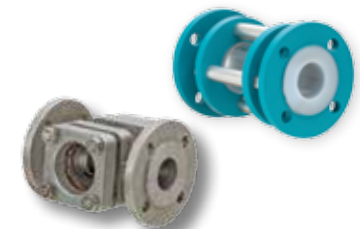
- DN 15 - 250 / PN 10 - 40
- NPS 1 - 4 / class 150



Sight-glasses / Tubular sight-glasses

OCULAR, CIRCULAR

- DN 15 - 250 / PN 10 - 40
- NPS 1 - 4 / class 150



Strainers with different mesh width

BASKET, DELTA-SF

- DN 15 - 250 / PN 10 - 40
- NPS 1 - 4 / class 150

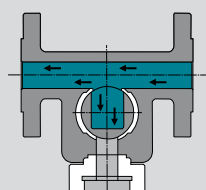


Safe and simple sampling valves and systems – free of pressure and cavities (PTFE-sleeved or FEP/PFA-lined)

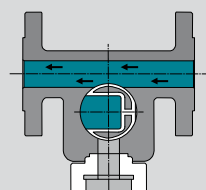


Type CONTIFLOW

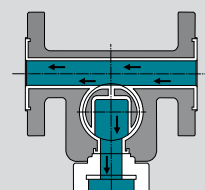
- defined representative sample quantity (liquids)
- closed system (contamination free)
- pressureless sampling for incompressible media (positive overlap)
- simple and safe operation, optional with needle system for bottles with septum



filling of plug



pressureless sampling



sampling in bottle



Sampling plug valve for liquids and solids

CONTIFLOW

- no flow interruption, piggable
- DN 15 - 150 / PN 10 - 40, NPS ½ - 6, class 150 - 300



Sampling system for liquids

VARIO

- free definable representative sample quantity
- DN 6- 25 / PN 10 - 100, NPS ¼ - 1, class 150 - 600
- pipe threads (tube fittings optional)



Sampling plug valve for liquids

SAMPLING

- spilling eliminated and contamination free
- DN 15 - 100 / PN 10 - 40, NPS ½ - 4, class 150 - 300



Sampling system for gas and liquid gas

GSP / LG-SP

- contamination free
- DN 15 - 100 / PN 10 - 40, NPS ½ - 4, class 150 - 300



Sampling system for two-phase liquids (E.g. oil and water)

SAMPLING SIC

- representative long-term measurement
- DN 15 - 600 / PN 10 - 40, NPS ½ - 24 class 150 - 300

Defined sample volume, sampling pressure-less and representative, safe for liquids, liquid gas, gas and solids

Type CONTIFLOW with needle-system:

- pressure-less and without flow interruption
- also for toxic media for emission- and spillage-free sampling



Individual bottle connection

PTFE-adapters

- for lab bottles with ISO thread GL32/45 and others
- application for liquids posing a small amount of danger and solids-containing media



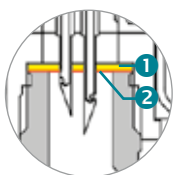
Clamping bottle holder

- for insulated, splinter-protected insertion of the lab bottles
- application for quick and simple replacement of the sampling container even with hot media



Needle system with septum

- for lab bottles with septum (consisting of butyl ① and PTFE diaphragm ②)
- needle system in different inner diameters of 2-6 mm
- application for highly aggressive and toxic media for emission- and spillage-free sampling



AZ-Actuation: modular and simple!



Modular build:

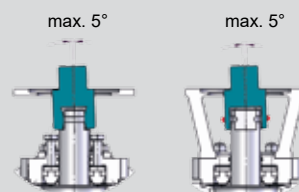
- actuation by hand lever, hand gear or actuator
- setup via console according to DIN ISO 5211
- alternatively with flange extension (FV) or other accessories

Benefit: Flexible setup

Cardanic coupling:

- patented AZ coupling to connect plug shaft and actuator
- no lateral forces

Benefit: very long lifetime



Actuators / AZ - AIR GEAR

- single and double acting design
- for valves with high torques 200.000 Nm (AZ - AIR GEAR)
- end position adjustable 0° – 360° (multiport automation AIR GEAR)



Ratchet-coupling for multiway valves

SSK

- Switching for 90°, 180°, 270°, 360° and 120°, 240°, 360°



Flange extension, locking devices optional

ISO-FV

- simple mounting of the extension and the actuators
- easy plug adjustment accessible



Plug stem extension (T-wrench) for all AZ valves, locking devices optional

KSV

- for remote control
- for thick-walled insulation tubes



Locking Devices for all AZ valves

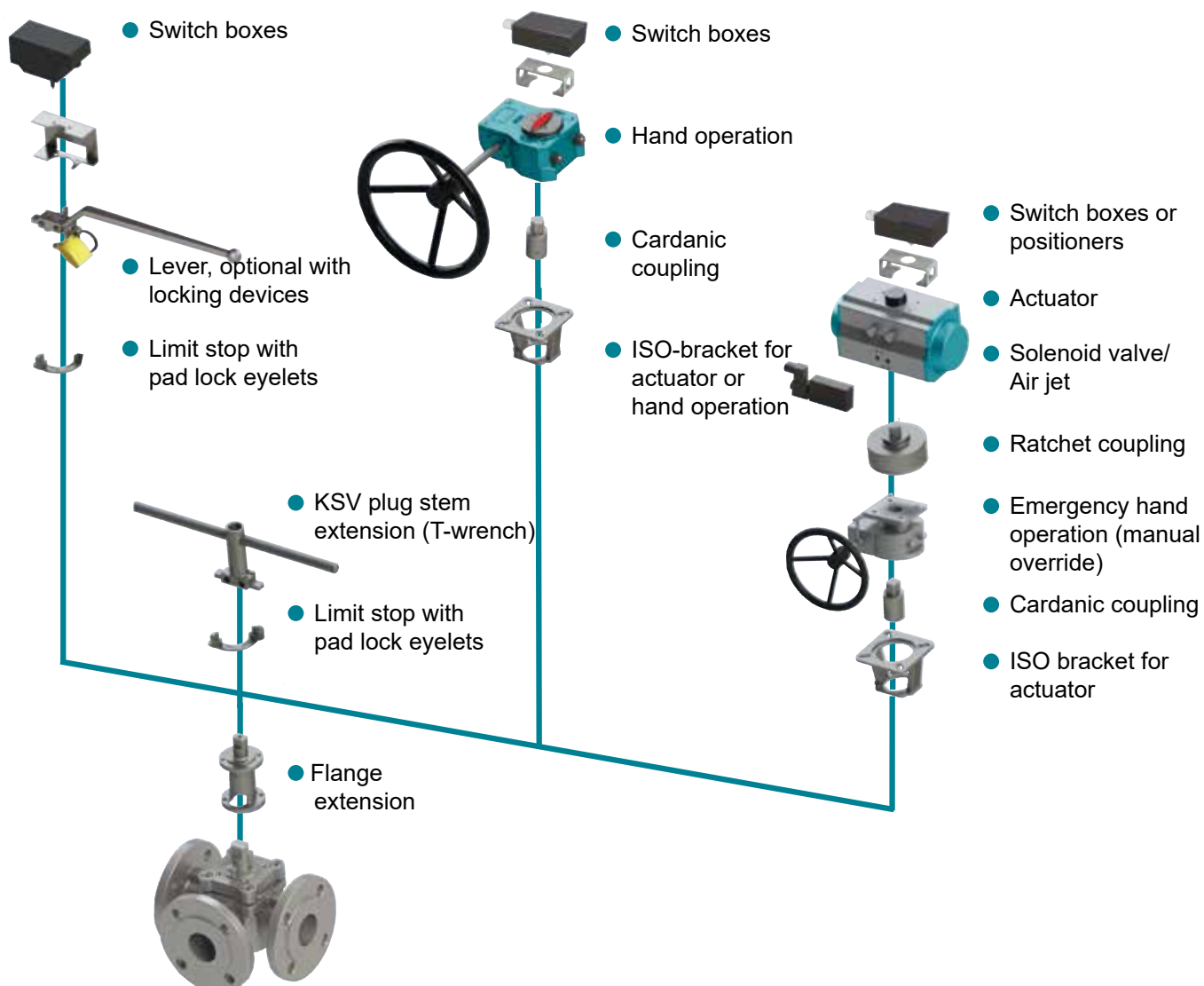
- pilot valve combinations
- linear key conception
- indexing plunger arrestor / pad lock eyelets



Type
ISO-EXTRA 24"

**AZ - AIR GEAR: Alternative rotary actuator 90°/180°/
270°/360° for all valves with high torques**

- compact design
- $M_d \geq 200.000 \text{ Nm}$ and higher possible
- Double-acting / single-acting
- Manual emergency operation
- Economical manufacturing due to standard components
- Space and weight savings
- 100% pneumatic (ATEX certification)
- Adjustable opening and closing speed



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