



GEMÜ 554

## GEMÜ globe and control valves

### Areas of application

- Pharmaceutical, biotechnology and cosmetics industries
- Foodstuffs and beverages
- Chemical engineering
- Power generation and environmental engineering
- Mechanical engineering and processing industry

### Features

- Very suitable for high cycle duties
- Very good control characteristics
- Individual instrumentation
- High flow rates
- Various connections and body materials available
- Manual or pneumatic

# Globe and control valves



## Features

- Globe valves are suitable for clean, chemically inert and slightly corrosive liquid media, gases and steam
- They are very suitable for automated tasks with fast cycle duties and high switching frequencies
- In combination with suitable positioners, globe valves are very suitable for use as control valves
- Depending on the design, the operation limits range up to an operating pressure of 40 bar and an operating temperature of up to 180 °C, optionally up to 300 °C (only possible as special version on certain types)
- Standard nominal sizes DN 8 to 150



## Isolation and control of steam

In many industrial processes, steam is an efficient energy source with good controllability and particularly good heat transfer, and it is therefore used in many varied industries. Among other things, it is used for product or air humidification, as heating steam, for surface cleaning, for sterilization purposes in the pharmaceutical sector, for example, or it is used in steam turbines to generate electricity. Depending on the intended use, steam has different qualities, whereby we can distinguish between process and black steam, pure steam and ultra pure steam.

How the steam is generated is therefore the most important difference. Treated water is used for process steam, in order to prevent corrosion and deposits on steam boiler systems. Depending on the type of process-steam generation, saline or low-salt feed water is required.

To comply with the required quality for pure steam, pure water is used.



### Applications

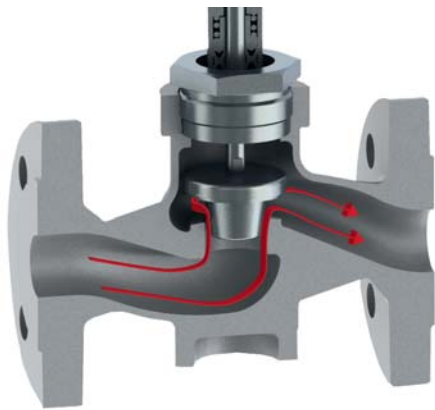
- Industrial and sterile steam generation and distribution
- Industrial gas manufacturing and distribution
- Heat exchangers and heating systems
- Steam control for humidity regulation in production plant and rooms
- Filling
- Dyeing and cleaning
- Compressed air production and supply



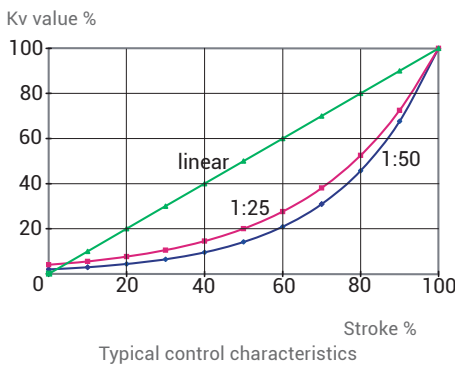
### Application examples

- Control of wash water and cleaning media in the clothing and beverage industries
- Control of sterile air in dairies and the pharmaceutical industry
- Steam control in sterilisers and autoclaves
- Steam control for expansion of plastics and in paper machines
- Coolant and lubricant supply in machine tools
- Smoke and steam control in food smoking plants
- Pressure application in storage tanks with gases (e.g. nitrogen)

# Flow restrictors for globe valves



A simple Open/Close control is not sufficient to exert a flexible influence on the volumetric flow in a pipe. The volumetric flow must be set precisely to a range adapted to the control task. For this purpose, the valves are equipped with appropriate flow restrictors. In order to achieve the desired control characteristic they can be designed and manufactured to suit the application.



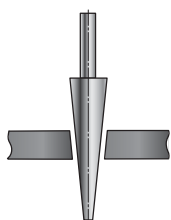
With increasing opening of the valve, the flow restrictor changes the annular gap at the valve seat providing a defined control characteristic. A suitable globe valve, the right flow restrictor and a suitable actuator are necessary for optimum functionality.

The most frequently used control characteristics are linear and equal-percentage, 1:25 and 1:50. Linear means that the flow increases linearly with the opening stroke of the valve. The flow is 50% at the 50% open valve position. This provides good valve control over the whole stroke range.

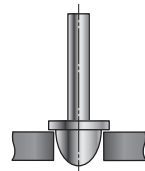
The equal percentage control characteristics have the character of an exponential function. In the lower range of approx. 10% to 60% opening stroke, these valves can be very finely regulated depending on the valve stroke.

Flow restrictors can be used for both angle seat globe valves and straight seat globe valves. Straight seat globe valves are preferred for precise control, as the flow force in this valve principle is mainly axial and therefore mechanically favourable. GEMÜ uses stainless steel as standard for the flow restrictors. Special materials are available on request.

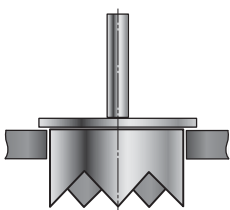
Seals are integrated for sealing the valves.



Regulating needle



Regulating cone



Regulating cage

Depending on the type of globe valve and the nominal size, flow restrictors may have widely different geometries. Regulating needles are used for very small nominal sizes and high pressures because they can control with high precision. At large nominal sizes, modified regulating cones or regulating cages are preferred for weight reasons.

# GEMÜ modular system

## Activation

### Positioners and/or process controllers

### Electrical position indicators

### Combi switchboxes



## Valve actuator



## Valve body



# Angle seat globe valve with aluminium piston actuator GEMÜ 514

## Description

- Pneumatic aluminium piston actuator
- Seal at the valve seat made of PTFE or steel
- Available as shut-off or control valve
- Standard gland packing suitable for vacuum up to 20 mbar (abs.)
- Suitable for contact with foodstuffs in accordance with Regulation (EC) No. 1935/2004 (optional)
- Option with metal bellows available
- Control medium connection can be rotated through 360°

## Technical specifications

- Nominal sizes\*:  
DN 10 to 80
- Connections:  
Butt weld spigot, flange, threaded connection
- Body materials:  
Cast bronze, 1.4435 (investment casting),  
1.4408 (cast stainless steel)
- Media temperature\*:  
-10 to 180 °C
- Operating pressure\*:  
Max. 25 bar

\* depending on version and/or operating parameters



GEMÜ 514  
with regulating cone



**CRN**

# Angle seat globe valve with stainless steel actuator GEMÜ 550

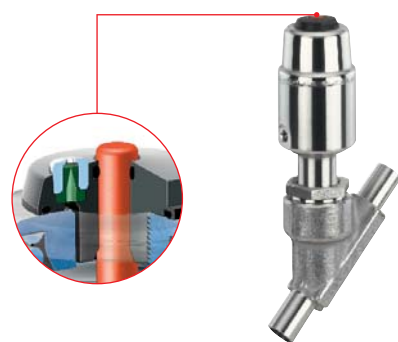
## Description

- Pneumatic stainless steel piston actuator
- Actuator components made of stainless steel
- Seal at the valve seat made of PTFE
- Good flow capability and low weight
- Standard optical position indicator
- Available as shut-off or control valve
- Standard gland packing suitable for vacuum up to 20 mbar (abs.)
- Suitable for contact with foodstuffs in accordance with Regulation (EC) No. 1935/2004

## Technical specifications

- Nominal sizes\*:  
DN 6 to 80
- Connections:  
Butt weld spigot, clamp connections, flange, threaded connection
- Body materials:  
1.4435 (investment cast or forged body)  
1.4408 (cast stainless steel)
- Media temperature\*:  
-10 to 180 °C
- Operating pressure\*:  
Max. 25 bar

\* depending on version and/or operating parameters



Available with special venting valve to prevent the penetration of cleaning media (optional; only in conjunction with an optical position indicator)



GEMÜ 550  
with GEMÜ 4242 combi switchbox



**CRN**

# Angle seat globe valve with plastic actuator GEMÜ 554

## Description

- Pneumatic plastic piston actuator
- Good flow capability and low weight
- Seal at the valve seat made of PTFE
- Standard optical position indicator
- Available as shut-off or control valve
- Standard gland packing suitable for vacuum up to 20 mbar (abs.)
- Suitable for contact with foodstuffs in accordance with Regulation (EC) No. 1935/2004 (optional)

## Technical specifications

- Nominal sizes\*:  
DN 8 to 80
- Connections:  
Butt weld spigot, clamp connection, flange, threaded connection
- Body materials:  
1.4435 (investment cast or forged body)  
1.4408 (cast stainless steel), cast bronze
- Media temperature\*:  
-10 to 180 °C
- Operating pressure\*:  
Max. 25 bar

\* depending on version and/or operating parameters



GEMÜ 514  
with GEMÜ 1434  $\mu$ Pos positioner



**CRN**



# Angle seat globe valve with aluminium piston actuator GEMÜ 532

## Description

- Pneumatic aluminium piston actuator
- Seal at the valve seat made of PTFE or steel
- Available as shut-off or control valve
- Standard gland packing suitable for vacuum up to 20 mbar (abs.)
- Suitable for contact with foodstuffs in accordance with Regulation (EC) No. 1935/2004 (optional)
- Option with metal bellows available
- Control medium connection can be rotated through 360°

## Technical specifications

- Nominal sizes\*:  
DN 15 to 100
- Connections:  
Flange
- Body materials:  
1.4408 (cast stainless steel),  
GGG 40.3 (SG iron)
- Media temperature\*:  
-10 to 180 °C
- Operating pressure\*:  
Max. 40 bar

\* depending on version and/or operating parameters



**CRN**

# Globe valve

## GEMÜ 530

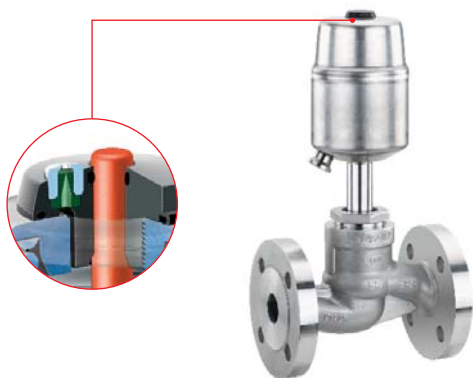
### Description

- Good flow capability and compact design
- Standard gland packing suitable for vacuum up to 20 mbar (abs.)
- Available as shut-off or control valve
- Standard optical position indicator
- Seal at the valve seat made of PTFE

### Technical specifications

- Nominal sizes\*:  
DN 15 to 100
- Connections:  
Flange
- Body materials:  
1.4408 (cast stainless steel)  
GGG 40.3 (SG iron)
- Media temperature\*:  
-10 to 180 °C
- Operating pressure\*:  
Max. 40 bar

\* depending on version and/or operating parameters



Available with special venting valve to prevent the penetration of cleaning media (optional; only in conjunction with an optical position indicator)



# CRN

# Globe valve

## GEMÜ 534

### Description

- Good flow capability and compact design
- Standard gland packing suitable for vacuum up to 20 mbar (abs.)
- Available as shut-off or control valve
- Standard optical position indicator
- Seal at the valve seat made of PTFE

### Technical specifications

- Nominal sizes\*:  
DN 15 to 100
- Connections:  
Flange
- Body materials:  
1.4408 (cast stainless steel)  
GGG 40.3 (SG iron)
- Media temperature\*:  
-10 to 180 °C
- Operating pressure\*:  
Max. 40 bar

\* depending on version and/or operating parameters



**CRN**

# Angle seat globe valve specially for pure steam GEMÜ 505/555

## Description

- Valve spindle sealed via stainless steel bellows
- Suitable for contact with foodstuffs in accordance with Regulation (EC) No. 1935/2004
- Seal at the valve seat made of PTFE
- Available as a control valve
- Standard optical position indicator
- Batch traceability for all media wetted parts
- Valve plug welded to valve spindle, eliminating dead spaces in the media wetted area

## Technical specifications

- Nominal sizes\*: DN 8 to 80
- Connections: Butt weld spigot, clamp connection
- Body materials: 1.4435 (investment casting or forged body)
- Media temperature\*: -10 to 180 °C
- Operating pressure\*: Max. 10 bar

\* depending on version and/or operating parameters



GEMÜ 555



GEMÜ 505

# Globe valves and position indicators for hazardous locations

ATEX (ATMosphere EXplosible) is an abbreviated designation for the European Directive 94/9/EC. It regulates the use of explosion-proof, electrical and non-electrical devices, components and protective devices. The ATEX Directive classifies explosive atmospheres in various categories. It assigns the different systems in accordance with their suitability for use in a potentially explosive environment.



## GEMÜ globe valves

- The valves can be used, depending on the type and in accordance with ATEX, in Category 2, Zone 1 and/or Zone 21



## GEMÜ position indicators

- The electrical position indicators can be used, depending on the type and in accordance with ATEX, in Category 2, Zone 1 and/or Zone 21



# Globe valves for special requirements



## GEMÜ 566

- Control of liquid media from 63 l/h to 2500 l/h
- Available with linear or equal-percentage control characteristic
- Control mechanism integrated into the body for simplified actuator replacement and potential later automation
- Three actuator types selectable (manual, pneumatic, motorized)



## GEMÜ 536

- Robust design
- Good flow capability
- Precise controllability thanks to guided regulating cage and membrane actuator
- Suitable for high operating temperatures and pressures

## CRN



## GEMÜ 352

- Suitable for separating, mixing and bringing together media currents
- Seal at the valve seat made of PTFE
- Available as a control valve
- Standard gland packing suitable for vacuum

# Globe valves for shut-off and control tasks

## Premature wear and selection in relation to cavitation and unacceptable noise

Problems may occur in the selection of valves and control fittings due to cavitation. Damage to the interior valve fitting, the valve body or the pipe is possible. In addition, loud noise of a high frequency may occur.

Cavitation is the formation of steam bubbles in liquids. It occurs when the local static pressure in a liquid drops below the critical value. This condition can occur, for example, at the constriction between the valve seat and the regulating cone. If the pressure rises again after the constriction, the steam bubbles collapse again, virtually imploding. This creates liquid jets of a high speed which can cause damage when they hit the interior valve fitting or the pipe. Molecules are ejected from the surfaces of the adjacent components. Cavitation causes premature wear and failure of the components.

In order to prevent cavitation, the exit speed of the liquid at the valve seat should not be too high. The maximum flow speed depends on the medium and must therefore be assessed individually.

It is recommended to have the control Described by GEMÜ beforehand. During this stage, properties that may occur such as cavitation or excessive flow velocity are determined and specific solution proposals can be offered to minimise or prevent them.

In addition to the correct Description, the course of the pipe before and after the valve also influences the flow. No bent pipe sections should be installed directly before and after the valve. The free outlet distance should be at least 10 times the length of the valve diameter. As large a pipe nominal size as possible should be used for the outlet.

The control valve can be designed on the basis of process conditions with the aid of CONVAL design software. GEMÜ control valves can also be designed using the GEMÜ in-house design software "ValveSizer", which is based on CONVAL.



GEMÜ 554  
with GEMÜ 1434  $\mu$ Pos  
positioner



# Positioners and process controllers



## GEMÜ 1434 µPos

- Intelligent positioner
- Signal: 24 V DC, 3-wire technology
- Housing material: Cover: PP, UV-stabilised  
Base: Anodised aluminium or stainless steel
- Mounting to linear actuators: Direct or remote
- Control function of valve actuator.  
Control function 1, normally closed (NC)  
Control function 2, normally open (NO)  
Control function 3, double acting (DA)





## GEMÜ 1435 ePos

- Intelligent positioner
- Signal: 24 V DC, 3-wire technology
- Housing material: Epoxy coated aluminium
- Mounting to linear or quarter turn actuators: Direct or remote
- Control function of valve actuator.  
Control function 1, normally closed (NC)  
Control function 2, normally open (NO)  
Control function 3, double acting (DA)



## GEMÜ 1436 cPos


- Intelligent positioner and integrated process controller
- Signal: 24 V DC, 3-wire technology
- Housing material: Cover: PSU, base: PP (30% glass fibre reinforced)
- Control function of valve actuator.  
Control function 1, normally closed (NC)  
Control function 2, normally open (NO)  
Control function 3, double acting (DA)
- Mounting to linear or quarter turn actuators: Direct or remote
- Profibus DP  , DeviceNet 



# Electrical position indicators and combi switchboxes



## GEMÜ 1235/1236

- Electrical position indicator
- Valve stroke: 3–75 mm
- Housing material: Cover: PP, UV-stabilized, base: GEMÜ 1235 - PVDF black / GEMÜ 1236 - stainless steel
- Optical position indicator
- Feedback: OPEN and/or CLOSED
- IO-Link  **IO-Link**






## GEMÜ 1230

- Electrical position indicator with microswitches
- Valve stroke: 2–20 mm
- Housing material: Cover: PSU, base: PP (30% glass fibre reinforced)
- Optical position indicator
- Feedback: OPEN and/or CLOSED



## GEMÜ 4240/4242

- Combi switchbox with integrated 3/2-way pilot valve
- Valve stroke: GEMÜ 4240: 5–75 mm/GEMÜ 4242: 2–75 mm
- Housing material: Cover: PC, UV-stabilized, base: GEMÜ 4240 – PPS/GEMÜ 4242 – aluminium (anodized), stainless steel or PPS
- Optical position indicator
- Feedback: OPEN and/or CLOSED
- IO-Link  **IO-Link**, AS-i , DeviceNet 

# Overview of positioners and process controllers



Function / Features		GEMÜ 1434 µPos	GEMÜ 1435 ePos	GEMÜ 1436 cPos	GEMÜ 1436 cPos eco
Controller type	Positioner	•	•	•	•
	Process controller			•	
Operation	Local display / keypad		•	•	
	Status display	•	•	•	•
	Web browser user			•	
	Fieldbus option (Profibus DP, Device Net)			•	
Housing	Plastic	•		•	•
	Aluminium		•		
Functions	Automatic initialisation (speed-AP)	•	•	•	•
	Alarm / error outputs		•	•	
	Min/max positions adjustable		•	•	
Mounting	Direct mounting to linear actuators	•	•	•	•
	Remote mounting to linear actuators	•	•	•	•
	Direct mounting to quarter turn actuators		•	•	•
	Remote mounting to quarter turn actuators		•	•	•
Control function of valve actuator	Control function 1, normally closed (NC)	•	•	•	•
	Control function 2, normally open (NO)	•	•	•	•
	Control function 3, double acting (DA)		•	•	
Air output	15 NI/min.	50 NI/min. 90 NI/min.	150 NI/min. 200 NI/min. 300 NI/min.	150 NI/min. 200 NI/min.	

You can find further information on our homepage:  
[www.gemu-group.com](http://www.gemu-group.com).



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