



ACVATIX™

## 2-port ball valves with flanged connection, PN25

VAF51..

- 
- Gray cast iron HT250 (EN-GJL-250) valve body
  - DN 65...150
  - $k_{vs}$  63...360 m<sup>3</sup>/h
  - Angle of rotation 90°
  - Flange connection to ISO 7005-2
  - Used with rotary actuators GBB..1E and GIB..1E without spring return

### Use

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For use in heating, ventilating and air conditioning systems as a control or safety shutoff valve.

For closed circuits of cooling water (Please refer to cavitations on page 4).

## Type summary

Product number Type	Stock number	DN	$k_{vs}$ [m <sup>3</sup> /h]	$S_v$
<b>VAF51.65-63</b>	S55232-V100	65	63	50
<b>VAF51.80-100</b>	S55232-V101	80	100	
<b>VAF51.100-160</b>	S55232-V102	100	160	
<b>VAF51.125-200</b>	S55232-V103	125	200	
<b>VAF51.150-360</b>	S55232-V104	150	360	

DN = nominal size

$k_{vs}$  = nominal flow rate of cold water (5...30 °C) through the fully open ball valve at a differential pressure of 100 kPa (1 bar)

$S_v$  = rangeability  $k_{vs} / k_{vr}$

$k_{vr}$  = smallest  $k_v$  value at which the flow characteristic tolerances can still be maintained at a differential pressure of 100 kPa (1 bar)

## Ordering

Ball valve, actuator must be ordered separately.

When ordering please specify the quantity, product name and type code.

Example	Product number	Stock number	Designation	Quantity
	VAF51.65-63	S55232-V100	2-port ball valve flanged, PN25, mounting sets included	2
	GBB131.1E	GBB131.1E	Rotary actuator	2

## Delivery

Ball valve and its related mounting sets are packed together.

Ball valves and rotary actuators are packed and delivered separately.

The ball valves are supplied without counter-flanges and flange gaskets.

## Spare parts, Rev. no.

See page 8 for overview.

## Equipment combinations

Actuators	GBB..1E		GIB..1E		2*GIB..1E	
	$\Delta p_{max}$	$\Delta p_s$	$\Delta p_{max}$	$\Delta p_s$	$\Delta p_{max}$	$\Delta p_s$
Valves	[kPa]					
<b>VAF51.65-63</b>	400	400				
<b>VAF51.80-100</b>	400	400				
<b>VAF51.100-160</b>			400	400		
<b>VAF51.125-200</b>			300	300		
<b>VAF51.150-360</b>					400	400

$\Delta p_{max}$  = Maximum permissible differential pressure across valve's control path, valid for the entire actuating range of the motorized valve.

For low noise operation we recommend a maximum permissible differential pressure of 240 kPa

$\Delta p_s$  = Maximum permissible differential pressure at which the motorized valve will close securely against the pressure (close off pressure)

## Actuator overview

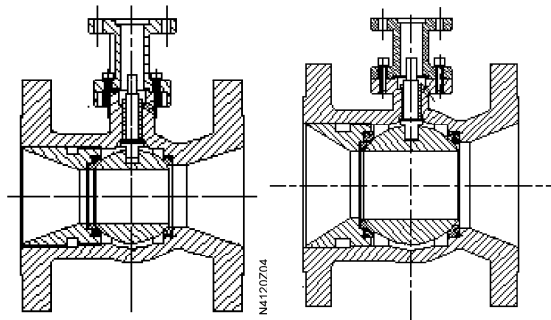
Type	Actuator type	Operating voltage	Positioning signal	time	Torque	Connecting cable	Data sheet
GBB331.1	Electro-motoric	AC 230 V	3-position	150 s	25 Nm	0.9 m	N4626
GBB131.1		AC 24 V					
GBB161.1		DC 0...10 V					
GIB331.1	Electro-motoric	AC 230 V	3-position	150 s	35 Nm	0.9 m	N4626
GIB131.1		AC 24 V					
GIB161.1		DC 0...10 V					

## Warning

GBB331.1, GBB131.1E, GIB331.1 and GIB131.1 actuator can't be used as on/off actuator. Operating with 2-position signal will damage the rotary actuator.

## Technical design

### Valve cross section

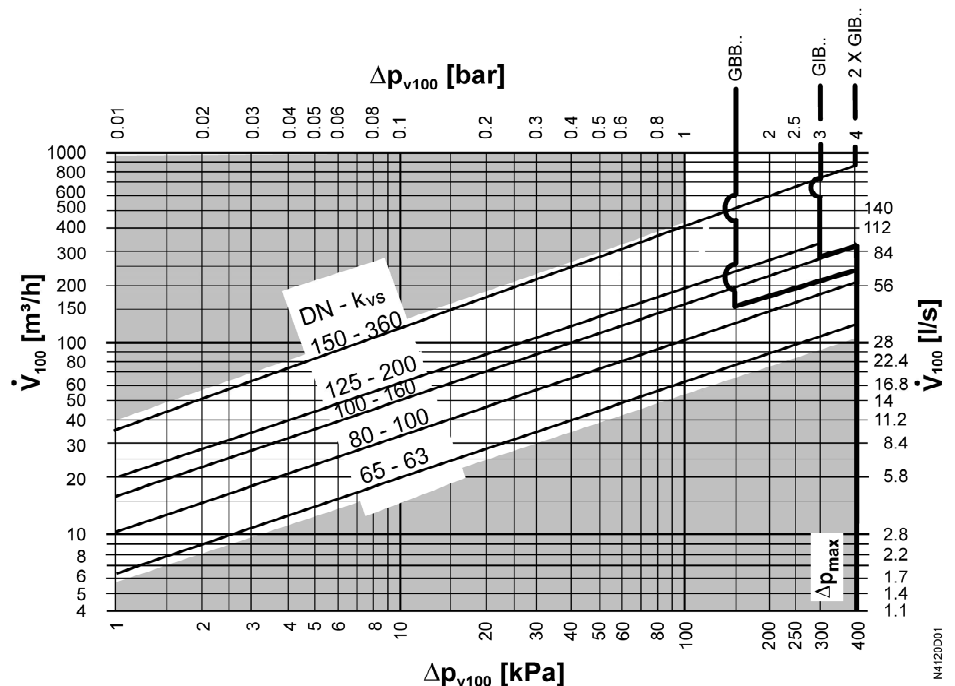


Special taper shape in inlet part of ball valve provides the ball valve control with excellent control capability.

Special PTFE- seat ring design for low torque operation.

## Sizing

### Flow diagram



$\Delta p_{\max}$  = Maximum permissible differential pressure across the valve, valid for the entire actuating range of the motorized valve.

For low noise operation we recommend a maximum permissible differential pressure of 240 kPa

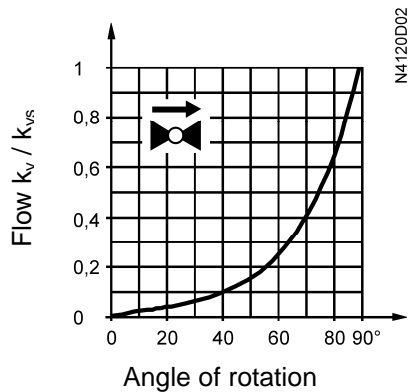
$\Delta p_{v100}$  = Differential pressure across the fully open valve and the valve's control path by a volumetric flow  $V_{100}$

$\dot{V}_{100}$  = Volumetric flow through the fully open valve

100 kPa = 1 bar  $\approx$  10 mWC

1 m<sup>3</sup>/h = 0.278 l/s water at 20 °C

**Valve flow characteristic**



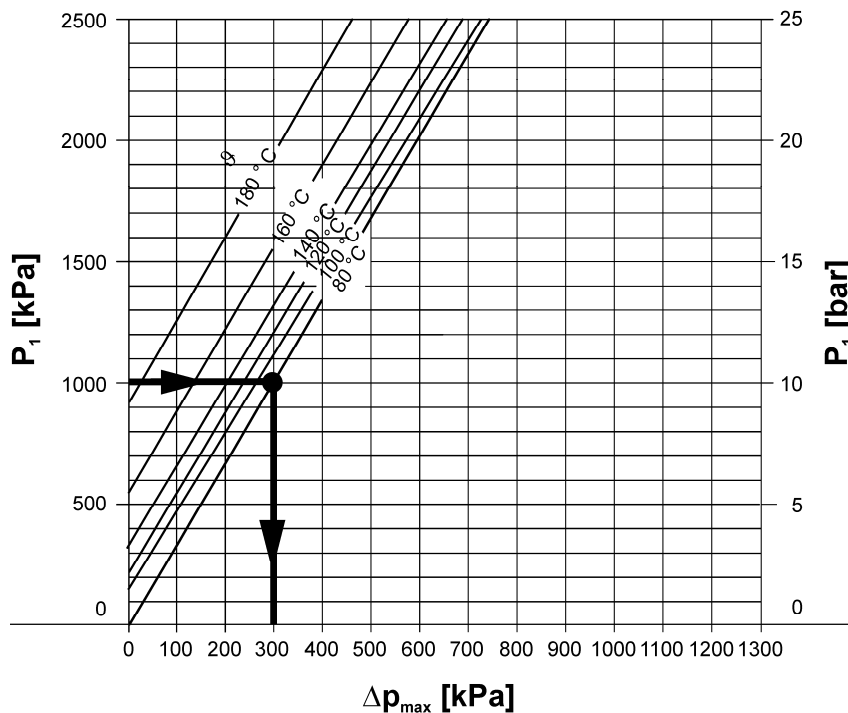
0...90° modified equal percentage  
 $n_{ql} = 3.0$  to VDI / VDE 2173

**Cavitation**

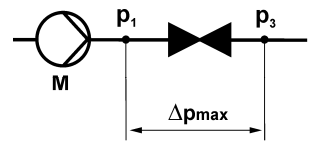
Cavitation accelerates wear on the ball and seat, and also results in undesirable noise. Cavitation can be avoided by not exceeding the differential pressure shown in the flow diagram on page 4, and by adhering to the static pressures shown below.

**Note on chilled water**

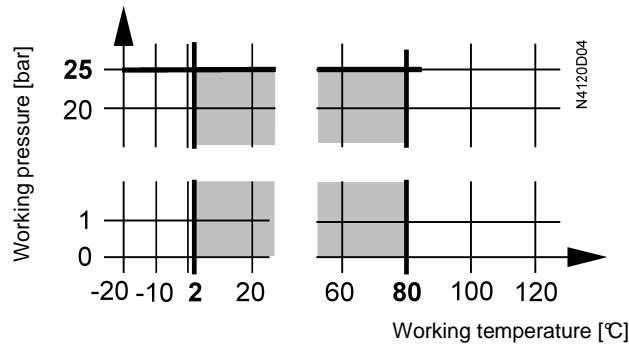
To avoid cavitations in chilled water circuits, please ensure sufficient counter pressure at valve outlet, e.g. by a throttling valve after the heat exchanger. Select the pressure drop across the valve at maximum according to the 80 °C curve in the flow diagram below.



- $\Delta p_{max}$  = Differential pressure with valve almost closed, at which cavitation can largely be avoided
- $p_1$  = Static pressure at inlet
- $p_3$  = Static pressure at outlet
- M = Pump
- $\vartheta$  = Water temperature



**Working pressure and temperature**  
Fluids



**Working pressure and medium temperature as per ISO 7005**

Current local legislation must be observed.

**Notes**

**Engineering**

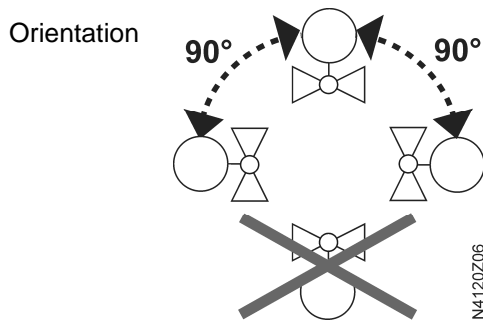
We recommend installing the ball valve in the return pipe, as the temperature in this pipe is lower for applications in heating systems, which could extend the life of stem sealing gland.

Please ensure the flow is cavitations free (Please refer to page 4).

Please always install a strainer upstream of the valve to increase the valve's functional safety.

**Mounting**

Both ball valve VAF51.. and rotary actuator GIB..1E or GBB..1E can easily be assembled on site. Neither special tools nor adjustments are required.  
The valve is supplied with Mounting Instructions CB1M4120en (74 319 0730 a).



**Direction flow** Pay attention to the valve's flow direction symbol → **during mounting.**

**Commissioning**

**Commission the ball valve only if the rotary actuator has been mounted correctly.**

Ball valve rotation counter clockwise: ball valve opens = increasing flow  
Ball valve rotation clockwise: ball valve closes = decreasing flow

**Maintenance**

VAF51.. ball valves with assembled rotary actuator require no maintenance.

**Warning**

When performing service work on the ball valve / rotary actuator:

- Deactivate the pump and disconnected the pump power supply
- Close the manual shutoff valves

Fully release the pressure in the piping system and allow pipes to completely cool down.

If necessary, disconnect the electrical wires of actuator before performing the service work.

Before putting the ball valve into operation again, make sure the rotary actuator is correctly fitted.

## Disposal



Before disposal, the ball valve must be dismantled and separated into its various constituent materials.

Legislation may demand special handling of certain components, or it may be sensible from an ecological point of view.

**Current local legislation must be observed.**

## Warranty

The technical data given for these applications is valid only in conjunction with the Siemens actuators, please refer to «Equipment combinations» on page 2 for details.

All terms of the warranty will be invalidated by the use of actuators from other manufacturers.

## Technical data

### Ball valve

#### Functional data

PN class	PN 25 to ISO 7268
Working pressure	To ISO 7005 within the permissible "medium temperature" range according to the diagram on page 5
Flow characteristic	equal percentage; $n_{gl} = 3.0$ to VDI / VDE 2173 (modified)
Leakage rate	0...0.01% of $k_{vs}$ value
Permissible media	Cooling water, chilled water, low temperature hot water, high temperature hot water, water with anti-freeze; Recommendation: water treatment to VDI 2035
Medium temperature	2...80 °C
Rangeability $S_v$	≥ 50

#### Materials

Valve body	Cast iron (HT250)
Ball	Stainless steel (304SS)
Stem	Stainless steel (304SS)
Seat	PTFE
Sphere	Teflon with graphite
Gland materials	NBR O-rings

#### Dimension / weight

Refer to «Dimensions» below	
Flange connections	ISO 7005-2 PN 25

#### Norms and standards

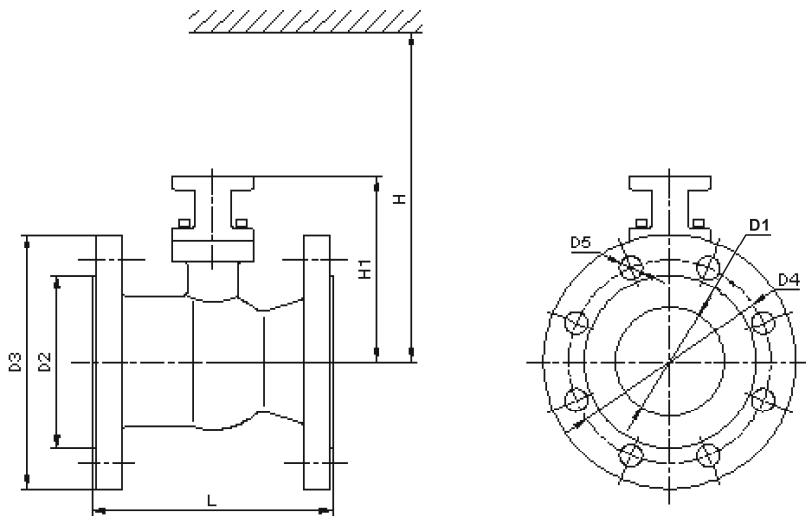
Environmental compatibility	ISO 14001 (Environment) ISO 9001 (Quality) SN 36350 (Environmentally compatible products) RL 2002/95/EG (RoHS)
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#### General ambient conditions

	Operation EN 60721-3-3	Transport EN 60721-3-2	Storage EN 60721-3-1
Environmental conditions	Class 3k5, Extended 3z11	Class 2K2	Class 1K3
Temperature	-10+55 °C	-32...+70 °C	-32...+50 °C
Humidity	0...95% r. h.	<95% r. h.	0...95% r. h.


## Dimensions

Dimensions in mm



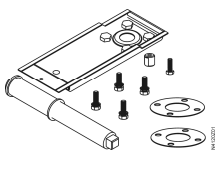
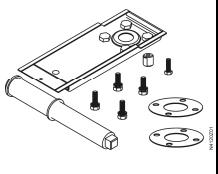
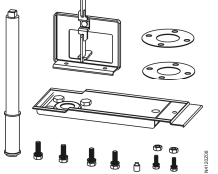
- DN = Nominal size  
 H = Total actuator height plus minimum distance to the wall or the ceiling for mounting, connection, operation, service, etc.  
 H1 = Dimension from the pipe centre to install the actuator (upper edge)

NA4120M01

Type	DN	L [mm]	D1 [mm]	D2 [mm]	D3 [mm]	D4 [mm]	D5 [mm]	H1 [mm]	H	 [kg]
VAF51.65-63	65	190	82	120	185	145	18	173	> 450	14
VAF51.80-100	80	190	82	136	200	160	18	173		16
VAF51.100-160	100	230	102	162	235	190	23	183	> 460	26
VAF51.125-200	125	254	125	188	270	220	26	190	> 470	37
VAF51.150-360	150	267	154	215	300	250	26	208	> 600	49

## Spare parts

### Order numbers for spare parts

Product number Type	DN	Mounting sets		Mounting sets and 2 actuator power pack
				
VAF51.65-63	65	ASK77.6		
VAF51.80-100	80	ASK77.6		
VAF51.100-160	100	ASK77.6		
VAF51.125-200	125		ASK77.7	
VAF51.150-360	150			ASK77.8

### Revision numbers

Product number	Valid from rev. no.
VAF51.65-63	..A
VAF51.80-100	..A
VAF51.100-160	..A
VAF51.125-200	..A
VAF51.150-360	..A