SIEMENS

4120

ACVATIX™

2-port ball valves with flanged connection, PN25

VAF51..

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

Use

For use in heating, ventilating and air conditioning systems as a control or shutoff valve.
For closed circuits of cooling water (Please refer to Cavitation on page 4).

Type summary

Product number Type	Stock number	DN	k_{vs} [m^3/h]	S_v
VAF51.65-63	S55232-V100	65	63	200
VAF51.80-100	S55232-V101	80	100	
VAF51.100-160	S55232-V102	100	160	
VAF51.125-200	S55232-V103	125	200	
VAF51.150-360	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)

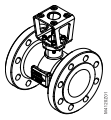
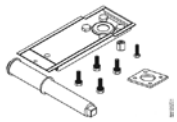
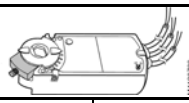
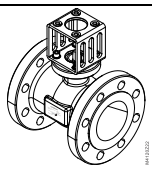
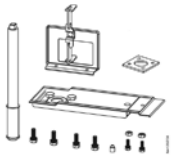
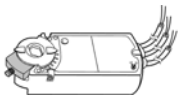
S_v = rangeability k_{vs} / k_{vr}

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*	*Product name and drawing*		*Quantity*
VAF51.65-63	S55232-V100	*2-port ball valve*	*Mounting set*	*1*
				
GBB131.1E	GBB131.1E	*Rotary actuator*		*1*
				
VAF51.150-360	S55232-V104	*2-port ball valve*	*Mounting set*	*1*
				
GIB131.1E	GIB131.1E	*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	
	Δp_{max}	Δp_s	Δp_{max}	Δp_s	Δp_{max}	Δp_s
Ball valves	[kPa]					
VAF51.65-63	400	400				
VAF51.80-100	400	400				
VAF51.100-160			400	400		
VAF51.125-200			300	300		
VAF51.150-360					400	400

Δp_{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

Δp_s = Maximum permissible differential pressure at which the motorized valve will close securely against the pressure (close off pressure)

Actuator overview

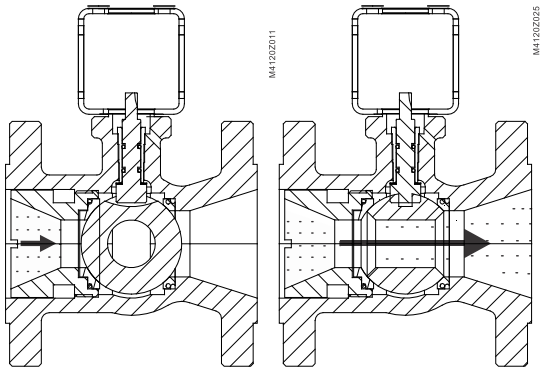
Type	Actuator type	Operating voltage	Positioning signal	Positioning time	Torque	Connecting cable	Data sheet
GBB331.1E	Electro-motoric	AC 230 V	3-position	150 s	25 Nm	0.9 m	N4626
GBB131.1E		AC 24 V					
GBB161.1E			DC 0…10 V				
GIB331.1E	Electro-motoric	AC 230 V	3-position	150 s	35 Nm	0.9 m	N4626
GIB131.1E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

Warning

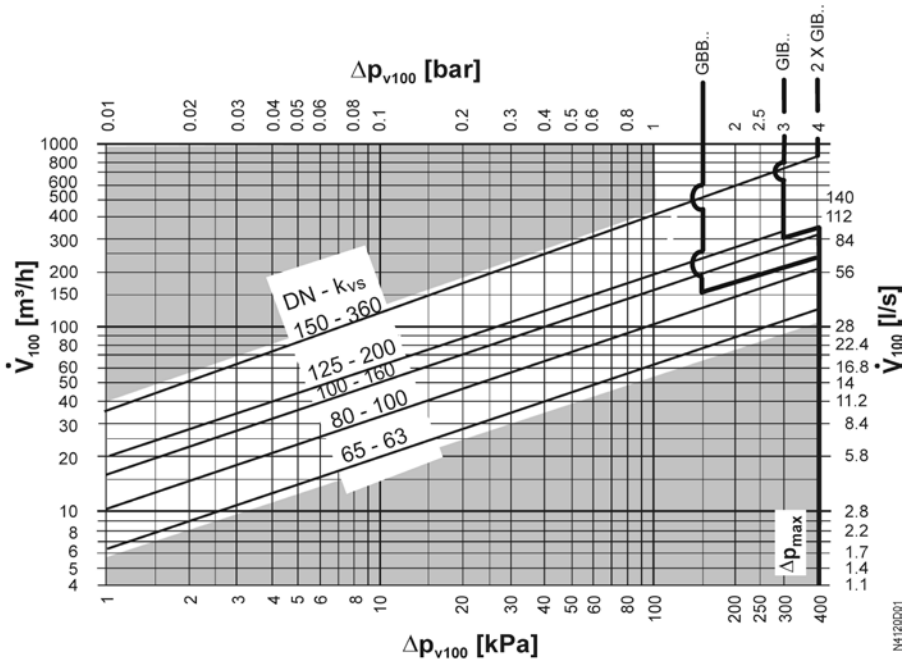
GBB331.1E, GBB131.1E, GIB331.1E and GIB131.1E actuator can't be used as on/off actuator. Operating with 2-position signal will damage the rotary actuator.

Technical design

Valve cross section



Flow diagram



Δp_{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

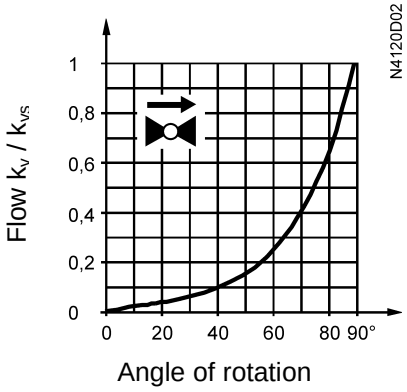
Δp_{v100} = Differential pressure across the fully open valve and the valve's control path by a volume flow V_{100}

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

100 kPa = 1 bar ≈ 10 mWC

1 m^3/h = 0.278 l/s water at 20 °C

Valve flow characteristic



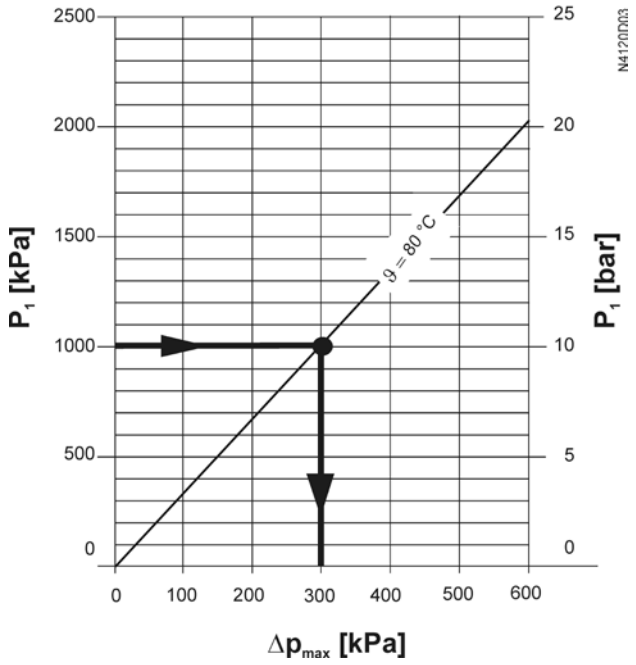
0…90 ° modified equal percentage
n_{ql} = 3.0 to VDI / VDE 2173

Cavitation

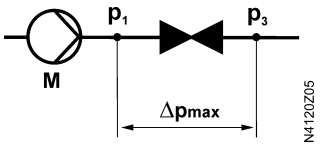
Cavitation accelerates wear on the ball and seat, and also results in undesirable noise. Cavitation can be avoided by not exceeding the differential pressure shown in the Flow diagram on page 4, and by adhering to the static pressures shown below.

Note on chilled water

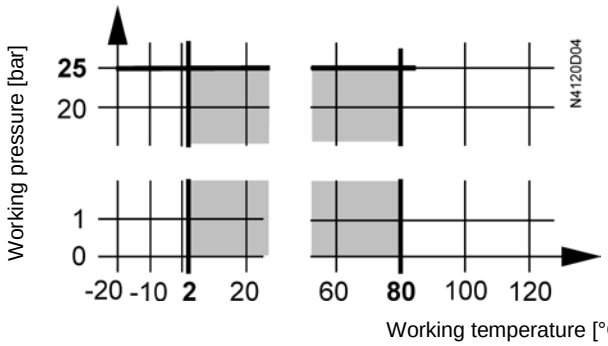
To avoid cavitation in chilled water circuits, please ensure sufficient counter pressure at valve outlet, e.g. by a throttling valve after the heat exchanger. Select the pressure drop across the valve at maximum according to the 80 °C curve in the flow diagram below.



Δp_{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
ϑ = Water temperature



Working pressure and temperature
Fluids



Working pressure and medium temperature as per IS0 7005

Current local legislation must be observed.

Notes

Engineering

We recommend installing the ball valve in the return pipe, as the temperature is

- higher for application in cooling systems and
- lower for applications in heating systems,

which could extend the life of stem sealing gland.

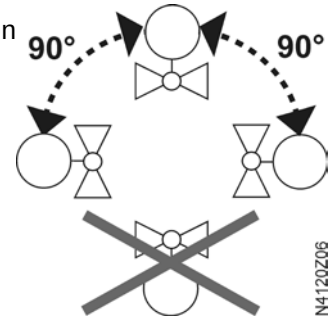
Please ensure the flow is cavitations free (Please refer to page 4).

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. Normal tools and adjustment are required.
The valve is supplied with Mounting Instructions CB1M4120en (74 319 0730 a).

Orientation



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

Technical data

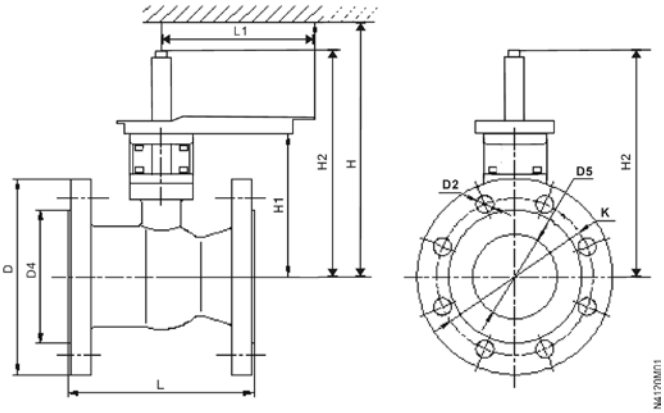
Ball valve		
Functional data	PN class	PN 25 to ISO 7268
	Working pressure	To ISO 7005 within the permissible “medium temperature ” range according to the diagram on page 5
	Flow characteristic	equal percentage; n_{gl} = 3.0 to VDI / VDE 2173 (modified)
	Leakage rate	0…0.01% of k_{vs} value
	Permissible media	Cooling water, chilled water, low temperature hot water, water with anti-freeze; Recommendation: water treatment to VDI 2035
	Medium temperature	2…80 °C
	Rangeability S_v	≥ 200
Materials	Valve body	Cast iron EN-GJL-250 (HT250)
	Ball	Stainless steel (SS304)
	Stem	Stainless steel (SS304)
	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 9001 (Quality) RL 2002/95/EG (RoHS)

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

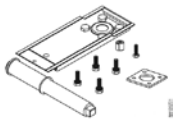
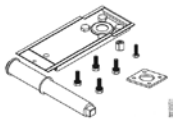
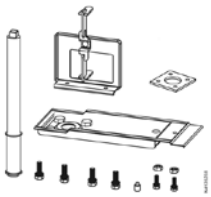


DN = Nominal size
H = Total actuator height plus minimum distance to the wall or the ceiling for mounting, connection, operation, service, etc.
H1 = Dimension from the pipe centre to install the actuator (upper edge)
H2 = Dimension from the pipe centre to the top of the shaft

Type	DN	L [mm]	L1 [mm]	D ø [mm]	D2 ø [mm]	D4 ø [mm]	D5 ø [mm]	K [mm]	H	H1 [mm]	H2 [mm]	kg [kg]
VAF51.65-63	65	190	205	185	18	120	82	145	> 450	184	300	17
VAF51.80-100	80	190	205	200	18	136	82	160		184	300	18.5
VAF51.100-160	100	230	205	235	23	162	102	190	> 460	194	310	29
VAF51.125-200	125	254	205	270	26	188	125	220	> 470	201	319	41
VAF51.150-360	150	267	236	300	26	215	154	250	> 600	219	412	55

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	..B
VAF51.80-100	..B
VAF51.100-160	..B
VAF51.125-200	..B
VAF51.150-360	..B