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Ingenuity for life
Install the "Scan to HIT" app and scan the DMC code on the product to get product information.
Valves and actuators:
Acvatix hydronics.
Everything under control.
Fast and easy planning, installation and commissioning
siemens.com/acvatix

The right solution for every hydronic project

With Acvatix™ you choose a versatile range of valves and actuators for superior ease of use, maximum control accuracy and energy efficiency. All control and hydraulic requirements can be met quickly and easily with Acvatix, from the generation of heating and cooling to energy distribution and use. Siemens provides useful tools and extensive knowledge to assist you in every project phase.

Your benefits at a glance

- Products for any hydronic requirement
- High level of investment protection, thanks to a long life and maximum reliability
- Support and practical tools for every project phase
- Easy and quick planning, installation and commissioning

Acvatix valves and actuators are improved continually based on Siemens' many years of experience in the field and rigorous testing in the in-house HVAC laboratory. For you, that means the highest quality and maximum reliability.

Your needs and requirements are the focus of our product development. We analyze not only the individual product, but also the entire HVAC system and the working processes behind it. This enables us to always remain one step ahead, while you benefit from optimally coordinated products that make your work easier from planning to service.

Acvatix hydronics.
Efficient all down the line

Product selection and engineering made easy

Tools from Siemens – such as the HIT Portal, the Acvatix slide ruler and the "Combi Valve Sizer" app – allow you to quickly find the right products. You can use the HIT Portal to design the entire HVAC application step by step while also accessing the specifications directly, complete with plant diagrams and lists of materials.

Installation in a few simple steps

Acvatix speeds up and simplifies installation thanks, for example, to color- and number-coded cables or a valve actuator coupling with just one screw or bayonet mount. If you lose the instructions for a product, simply use the "Scan to HIT" app from Siemens to scan the data matrix code on the product and receive complete product information.

Fast commissioning and optimized plant operation

Acvatix offers rapid commissioning and efficient plant control. Easy-to-see operating status and position indicators speed up commissioning, testing and maintenance of the plant and also help with any troubleshooting. Acvatix also features a robust design, outstanding reliability and minimal need for maintenance. Innovative products such as Intelligent Valves and PICVs save time and effort through automatic hydronic balancing – while also ensuring enhanced comfort and high energy efficiency. In addition, Intelligent Valves facilitate work through commissioning via WLAN with the "ABT Go" app or via cloud connection.

Understanding the language of buildings

Building Information Modeling (BIM) enables a significant productivity increase in the construction industry. BIM is a digitally supported process that changes the way we plan, build and operate buildings. Siemens provides a powerful, easy-to-use CAD browser that delivers BIM-compliant data that directly integrates into your BIM process, while also supporting more traditional CAD design workflows. Benefit from an easy transition to the future of construction with well over 4,000 products across all our global portfolio offerings:

siemens.com/bim

Combi Valve Sizer
App for easily selecting and sizing Acvatix PICVs and actuators. The app also calculates the maximum volumetric flow and presetting, checks the commissioning settings and provides access to all data sheets.

Scan to HIT
App providing quick access to all product information, including data sheets and installation instructions. Just use the app to scan the data matrix code on the product in order to read or download all the necessary information.

ABT Go
The mobile tool for commissioning and maintenance tasks of Siemens devices used in building automation and control systems e.g. the Intelligent Valves. Also suitable for fast and easy testing incl. test reports.

The right valve for every operating range

Valves are used in all parts of HVAC systems. We help you to find exactly the right valves for your application and for the particular purpose intended.

Intelligent Valves

Makes it a snap!

Intelligent Valves are self-optimizing dynamic valves with cloud connection used in heating groups and air handling units. They optimize consumption, increase energy efficiency and reduce operating costs.

PICVs

Hydronics made easy

PICVs (pressure-independent combi valves) prevent the oversupply of consumers, as well as reciprocal hydronic interference. They reduce energy consumption and thus energy costs. Precise temperature control also improves the comfort and well-being of building users.

Globe valves

Plan and install in record time

Globe valves are used for flow shutoff, flow regulation or fluids mixing in a wide variety of applications. They are used in the majority of HVAC applications – whether in energy generation, distribution or consumption.

Control ball valves

An excellent choice for your business

Control ball valves are used in closed circuits. They are highly efficient thanks to continuous and precise control and leak-free operation.

Magnetic valves

Solid conditions through accurate control

Magnetic valves have a preinstalled magnetic actuator and are used for controlling and mixing fluids (water, water with antifreeze, heat transfer fluid, etc.) and steam in nearly all HVAC applications.

Rotary valves

Close off and mix reliably

Rotary valves are primarily used in energy generation and distribution. Typical applications are if an additional boiler needs to be connected, or for the switching over of storage tank charging.

	Energy consumption	Energy distribution	Energy generation
Intelligent Valves	–	Heating groups, air handling units	–
PICVs	Radiators, chilled ceilings, VAV, fan coil units, zone control	Heating groups, air handling units	District heating
Globe valves	Floor heating, radiators, chilled ceilings, VAV, fan coil units, zone control	Domestic hot water, heating groups, air handling units	District heating, boiler plants, chiller plants
Control ball valves	Chilled ceilings, heated and chilled ceilings, VAV, fan coil units, zone control	Domestic hot water, heating groups, air handling units	–
Magnetic valves	–	Domestic hot water, heating groups, air handling units	District heating, boiler plants, chiller plants
Rotary valves	–	Domestic hot water, heating groups	Boiler plants, chiller plants, cooling towers

Note the blue-highlighted recommendations from Siemens for maximum performance in every area of application.

Do it right:
Dynamic hydronic balancing

Hydronic balancing means, the right amount of water at the right time in the right place. Sounds easy! But is it? There are several solutions, but one is definitely the right way to do it.

Hydronic balancing with standard control valves

To create a balanced hydronic system with standard control valves you must first determine design flow rates and calculate the pressure losses across the whole hydronic network. Then you determine a valve type, size and proper flow coefficient. In the next step you need to make sure that the selected valve has sufficient control authority for the job. After that, you also need to calculate and select a manual balancing valve for this consumer. You must repeat this process for all consumers and commission the whole system by manually adjusting the position of all balancing valves.

Now the system is balanced. But it is only statically balanced, which means that as soon as your hydronic distribution network operates at part load, the system is no longer balanced and runs inefficiently. This leads to high costs and energy consumption that could be avoided. Also, the room's comfort is impaired because pressure fluctuations have an impact on the room's temperature.

Not an optimal solution although it is still widely used.

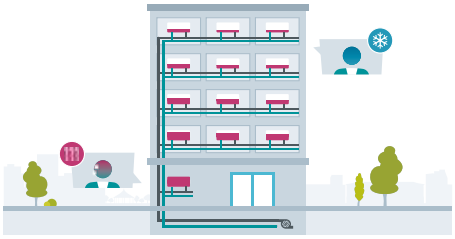
Hydronic balancing with dynamic valves

Using dynamic valves, such as PICV or Intelligent Valves, in your HVAC system the valves do the balancing for you. There is no need for complex pressure loss and control authority calculations. Only the volumetric flow determines which valve must be used. You also don't need any additional flow regulating or balancing valves, which means less installation effort. On-site commissioning is extremely simple thanks to easy max flow presetting and automatic balancing. This is possible because dynamic valves ensure balanced water flow rates under all load conditions, thereby eliminating any impact of fluctuations on the room temperature. This way, dynamic valves allow for energy savings of up to 30 percent with no sacrifice of comfort. With Intelligent Valves you can even save up to 37 percent.

In other words: Dynamic balancing is the right way to do hydronic balancing.

More on saving energy with PICVs

More on hydronic balancing



Static hydronic balancing: Uneven energy distribution under part load conditions.

Dynamic hydronic balancing: The hydronic system is always balanced, independent of load conditions and pressure fluctuations.

Benefits of dynamic hydronic balancing

- No need for complex hydronic calculations
- Fast and easy product selection
- Fewer components, less installation effort
- Effortless commissioning
- Automatic dynamic hydronic balancing
- High comfort
- Energy savings of up to 37 percent

		2-port valve	3-port valve	6-port valve	PN class	Type of connection	Silicon-free grease	Closed circuits	Open circuits	Permissible medium temperature [°C]	Recommended media: Chilled water	Cooling water [1]	Drinking water	Low-temperature hot water	High-temperature hot water	Water glycol mixture	Saturated steam	Superheated steam
IV*	EVG..	■			16	ET		■		1…120	■			■				
	EVF..	■			16	F		■		1…120	■			■				
PICVs	VPD../VPE..	■			10	ET		■		1…90	■			■		■		
	VQI46../VQP46..	■			25	ET		■		1…90	■			■		■		
	VPI46../VPP46..	■			25	IT		■		1…120	■			■		■		
	VPF43..	■			16	F	■	■		1…120	■			■		■		
	VPF53..	■			25	F	■	■		1…120	■			■		■		
Globe valves	VDN../VEN../VUN..	■			10	ET		■		1…120	■			■		■		
	VD1..CLC	■			10	ET		■		1…110	■			■		■		
	VVP45..	■			16	ET		■		1…110	■			■		■		
	VXP45..		■		16	ET		■		1…110	■			■		■		
	VMP45..		■		16	ET		■		1…110	■			■		■		
	VVP47..	■			16	ET		■		1…110	■			■		■		
	VXP47..		■		16	ET		■		1…110	■			■		■		
	VMP47..		■		16	ET		■		1…110	■			■		■		
	VVG41..	■			16	ET	■	■	■	-25…150	■	■		■	■	■	■	■
	VXG41..		■		16	ET	■	■	■	-25…150	■	■		■	■	■		
	VXG41..01[4]		■		16	ET	■	■	■	-25…150	■	■	■	■	■	■		
	VVG44..	■			16	ET	■	■		1…120	■			■		■		
	VXG44..		■		16	ET	■	■		1…120	■			■		■		
	VVG549..	■			25	ET		■		1…130	■	■		■	■	■		
	VVI46../2	■			16	IT		■		1…110	■			■		■		
	VXI46../2		■		16	IT		■		1…110	■			■		■		
	VVF22..	■			6	F	■	■		-10…130	■			■	■	■		
	VXF22..		■		6	F	■	■		-10…130	■			■	■	■		
	VVF32..	■			10	F	■	■		-10…150	■			■	■	■		
	VXF32..		■		10	F	■	■		-10…150	■			■	■	■		
	VVF42..	■			16	F	■	■		-10…150	■			■	■	■		
	VXF42..		■		16	F	■	■		-10…150	■			■	■	■		
	VVF43..	■			16	F	■	■	■	-20…220	■	■		■	■	■	■	■
	VXF43..		■		16	F	■	■	■	-20…220	■	■		■	■	■		
	VVF53..	■			25	F	■	■	■	-20…220	■	■		■	■	■	■	■
	VXF53..		■		25	F	■	■	■	-20…220	■	■		■	■	■		
	VVF63..	■			40	F		■	■	-25…220	■	■		■	■	■	■	■
	VXF63..		■		40	F		■	■	-25…220	■	■		■	■	■		
Control ball valves	VAG61..	■			40	ET	■	■		-10…120	■			■	■	■		
	VBG61..		■		40	ET	■	■		-10…120	■			■	■	■		
	VAI61..	■			40	IT	■	■		-10…120	■			■	■	■		
	VBI61..		■		40	IT	■	■		-10…120	■			■	■	■		
	VWG41..			■	16	ET/IT	■	■		1…90	■			■	■	■		
Magnetic valves	MXG461..	■	■		16	ET		■		1…130	■			■		■		
	MXG461..P	■	■		16	ET		■		1…130								
	MXG461B..	■	■		16	ET		■	■	-20…130	■	■	■	■		■		
	MXG461S..	■	■		16	ET		■	■	1…130	■	■		■		■		
	MXG462S..	■	■		16	ET		■	■	-20…130	■	■		■		■		
	MXF461..	■	■		16	F		■		1…130	■			■		■		
	MXF461..P	■	■		16	F		■		1…130								
	M3P..FY	■	■		16	F		■		1…120	■			■		■		
	M3P..FYP	■	■		16	F		■		1…120								
	MVF461H..	■			16	F		■		1…180	■			■	■	■	■	■
Rotary valves	VBF21..		■		6	F		■		1…120				■	■			
	VKF41..	■			16	F		■		-10…120	■			■	■	■		
	VKF46..	■			16	F		■	■	-10…120	■	■		■		■		
	VAG60..	■			40	ET	■	■		-10…120	■			■	■	■		
	VBG60..		■		40	ET	■	■		-10…120	■			■	■	■		
	VAI60..	■			40	IT	■	■		-10…120	■			■	■	■		
	VBI60..		■		40	IT	■	■		-10…120	■			■	■	■		
Refrigerant valves	M2FP03GX				32	–		■		-40…100								
	M3FK..LX..		■		32	S		■		-40…120								
	M3FB..LX..		■		PS 43	S		■		-40…120								
	MVL661..	■			PS 45	S		■		-40…120								
	MVS661..N	■			63	W/S		■		-40…120								

Recommendation: water treatment according to VDI 2035

[1] Open circuits; [2] Not for drinking water circuit (open circuit); [3] Variable air volume; [4] Sealed bypass; [5] As zone valve for floor heating systems;
IT = internally threaded connection, ET = externally threaded connection, F = flanged connection, S = soldered connection, W = welded connection
* Intelligent Valves

				Generation				Distribution			Consumption / Use								
Heat transfer oil	Media containing mineral oils	Refrigerants	Refrigerants (ammonia)	District heating	Boiler plants	Chiller plants	Cooling towers [1]	Domestic hot water [2]	Heating groups	Air handling units	Floor heating	Radiators	Chilled ceilings	Heated and chilled ceilings	VAV [3]	Fan coil units	Zone control	Product	Valve type
									■	■								EVG..	IV*
									■	■								EVF..	IV*
												■	■		■	■	■	VPD../VPE..	PICVs
									■	■	■ [5]		■		■	■	■	VQI46../VQP46..	PICVs
									■	■	■ [5]		■		■	■	■	VPI46../VPP46..	PICVs
				■					■	■								VPF43..	PICVs
				■					■	■								VPF53..	PICVs
												■						VDN../VEN../VUN..	Globe valves
											■		■		■	■	■	VD1..CLC	Globe valves
				■	■			■	■	■	■		■		■	■	■	VVP45..	Globe valves
					■			■	■	■	■				■	■	■	VXP45..	Globe valves
															■	■	■	VMP45..	Globe valves
											■		■		■	■	■	VVP47..	Globe valves
											■				■	■	■	VXP47..	Globe valves
															■	■	■	VMP47..	Globe valves
				■	■	■		■	■	■								VVG41..	Globe valves
					■	■		■	■	■								VXG41..	Globe valves
					■	■		■	■	■								VXG41..01 [4]	Globe valves
				■	■	■		■	■	■								VVG44..	Globe valves
					■	■		■	■	■								VXG44..	Globe valves
				■	■													VVG549..	Globe valves
											■		■		■	■	■	VVI46../2	Globe valves
											■		■		■	■	■	VXI46../2	Globe valves
					■	■		■	■	■								VVF22..	Globe valves
					■	■		■	■	■								VXF22..	Globe valves
				■	■	■		■	■	■								VVF32..	Globe valves
					■	■		■	■	■								VXF32..	Globe valves
				■	■	■		■	■	■								VVF42..	Globe valves
					■	■		■	■	■								VXF42..	Globe valves
■				■	■	■		■	■	■								VVF43..	Globe valves
■					■	■		■	■	■								VXF43..	Globe valves
■				■	■	■		■	■	■								VVF53..	Globe valves
■					■	■		■	■	■								VXF53..	Globe valves
■				■	■	■		■	■	■								VVF63..	Globe valves
■					■	■		■	■	■								VXF63..	Globe valves
								■	■	■			■		■	■	■	VAG61..	Control ball valves
								■	■	■						■	■	VBG61..	Control ball valves
								■	■	■			■		■	■	■	VAI61..	Control ball valves
								■	■	■						■	■	VBI61..	Control ball valves
														■				VWG41..	Control ball valves
				■		■		■	■	■								MXG461..	Control ball valves
■	■								■									MXG461..P	Control ball valves
						■		■	■									MXG461B..	Control ball valves
						■			■	■								MXG461S..	Control ball valves
						■			■	■								MXG462S..	Control ball valves
				■		■		■	■	■								MXF461..	Control ball valves
■	■								■									MXF461..P	Control ball valves
				■		■		■	■	■								M3P..FY	Control ball valves
■	■								■									M3P..FYP	Control ball valves
				■	■	■		■	■	■								MVF461H..	Control ball valves
					■				■									VBF21..	Rotary valves
					■	■			■									VKF41..	Rotary valves
					■	■	■	■	■									VKF46..	Rotary valves
					■	■		■	■									VAG60..	Rotary valves
					■	■		■	■									VBG60..	Rotary valves
					■	■		■	■									VAI60..	Rotary valves
					■	■		■	■									VBI60..	Rotary valves
		■	■			■												M2FP03GX	Refrigerant valves
		■				■												M3FK..LX..	Refrigerant valves
		■				■												M3FB..LX..	Refrigerant valves
		■				■												MVL661..	Refrigerant valves
		■	■			■												MVS661..N	Refrigerant valves

Intelligent Valves

Typical applications	Valve type	Operating voltage	Positioning signal	Interface
– Heating groups	**EVG4U10E.. DN15-50**	AC/DC 24 V	0...10 V, 2...10 V, 4...20 mA	BACnet over UDP/IP
– Air handling units	**EVF4U20E.. DN65-125**	AC/DC 24 V	0...10 V, 2...10 V, 4...20 mA	BACnet over UDP/IP

PN 16	1...120 °C	DN	k_{vs} [m³/h]	$\dot{V}_{min}$ [m³/h]	$\dot{V}_{100}$ [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	A6V11444716						
	EVG4U10E015	15	4	0.45	1.5	1400	350
	EVG4U10E020	20	5	0.9	3	1400	350
	EVG4U10E025	25	10	1.35	4.5	1400	350
	EVG4U10E032	32	11	2.1	7	1000	350
	EVG4U10E040	40	26	3.45	11.5	800	350
	EVG4U10E050	50	30	5.4	18	600	350
	EVF4U20E065	65	55	9	30	1600	500
	EVF4U20E080	80	80	14.5	48	1600	500
	EVF4U20E100	100	113	22.5	75	1600	500
	EVF4U20E125	125	142	36	120	1600	500

Intelligent Valve. Your benefits:

- Quick and easy adjustment to new requirements and changes in plans
- Less effort and significant time savings
- Fewer sources of error and fewer errors
- Simple, flexible, flawless installation
- Quick and easy parameterization – wirelessly via Wi-Fi
- Full transparency of valve settings at all times
- Fact-based analysis with verifiable hydronic balancing at the end of the project
- Verifiable, energy-efficient operation

Intelligent Devices by Siemens

Threaded PICVs

Typical applications	Actuators	Data sheet					4.5 mm		5 mm	
– Chilled ceilings	**STA..**	N4884					100 N		100 N	
– Fan coil units	**SUE21P**	A6V11780777								
– Zone control										
	Operating voltage	**Positioning signal**	**Positioning time [s]** STA	SUE21P						
	AC 230 V	2-position	210	12			**STA23**		**SUE21P**	
	AC/DC 24 V	2-position/PDM	270	–			**STA73**		–	

PN 25 1...90 °C	Without pressure testing points	With pressure testing points	DN	G [Inch]	$\dot{V}_{min}$ [l/h]	$\dot{V}_{100}$ [l/h]	Δp_{min} [kPa]	Δp_{max} [kPa]	Δp_{min} [kPa]	Δp_{max} [kPa]
Data sheet	A6V11877580									
	VQP46.10L0.5	**VQP46.10L0.5Q**	10	½	30	520	17	600	17	600
	VQP46.15L0.5	**VQP46.15L0.5Q**	15	¾	30	520	19	600	19	600
	VQP46.15L1.3	**VQP46.15L1.3Q**	15	¾	300	1300	27	600	27	600
	VQP46.20L1.5	**VQP46.20L1.5Q**	20	1	320	1500	35	600	35	600
	VQP46.25L1.8	**VQP46.25L1.8Q**	25	1 ¼	620	1800	30	600	30	600

PN 25 1...90 °C	Without pressure testing points	With pressure testing points	DN	Rp [Inch]	$\dot{V}_{min}$ [l/h]	$\dot{V}_{100}$ [l/h]	Δp_{min} [kPa]	Δp_{max} [kPa]	Δp_{min} [kPa]	Δp_{max} [kPa]
Data sheet	A6V11877580									
	VQI46.15L0.5	**VQI46.15L0.5Q**	15	½	30	520	19	600	17	600
	VQI46.15L1.3	**VQI46.15L1.3Q**	15	½	300	1300	27	600	27	600
	VQI46.20L1.5	**VQI46.20L1.5Q**	20	¾	320	1500	35	600	35	600
	VQI46.25L1.8	**VQI46.25L1.8Q**	25	1	620	1800	30	600	30	600

Threaded PICVs

Typical applications	Actuators	Data sheet
– Radiators – Chilled ceilings – Fan coil units	**RTN..** **STA..** **SSA..**	N2111 N4884 N4893

Operating voltage	Positioning signal	Positioning time [s]		4.5 mm, 100 N	4.5 mm, 100 N	2.5 mm, 100 N
AC 230 V	2-position	210		–	**STA23**	–
	3-position	150		–	–	**SSA31**
AC 24 V	3-position	150		–	–	**SSA81**
	0...10 V	270 [1]		–	**STA63**	–
AC/DC 24 V	2-position/PDM	270		–	**STA73**	–
	0...10 V	34		–	–	**SSA61**
				RTN51	–	–
				RTN71	–	–
				RTN81	–	–

PN 10 1...90 °C	DIN	DN	Rp/R	$\dot{V}$	$\dot{V}_{Nom}$ [2]			Δp_{min}	Δp_{max}	Δp_{min}	Δp_{max}	Δp_{min}	Δp_{max}
Data sheet	N2185		[Inch]	[l/h]	[l/h]			[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]
	VPD110A-..[2]	10	Rp/R ⅜	25...318	45	90	145	6 [3]	200	8 [3]	200	10 [3]	200
	VPD115A-..	15	Rp/R ½	25...318	45	90	145	6 [3]	200	8 [3]	200	10 [3]	200
	VPD110B-200	10	Rp/R ⅜	95...483	200			20	200	20	200	20	200
	VPD115B-200	15	Rp/R ½	95...483	200			20	200	20	200	20	200
	VPE110A-..	10	Rp/R ⅜	25...318	45	90	145	6 [3]	200	8 [3]	200	10 [3]	200
	VPE115A-..	15	Rp/R ½	25...318	45	90	145	6 [3]	200	8 [3]	200	10 [3]	200
	VPE110B-200	10	Rp/R ⅜	95...483	200			20	200	20	200	20	200
	VPE115B-200	15	Rp/R ½	95...483	200			20	200	20	200	20	200

Typical applications	Actuators	Data sheet
– Heating groups – Air handling units – Chilled ceilings – VAV – Fan coil units – Zone control	**STA..** **SSA..** **SAY..P..**	N4884 N4893 A6V10628469

Operating voltage	Positioning signal	Positioning time [s]			4.5 mm, 100 N	2.5 / 5 mm, 100 N	15 mm, 200 N
		STA	SSA	SAY			
AC 230 V	3-position	–	150/300	30	–	**SSA31**	**SAY31P03**
	2-position	210	–	–	**STA23**	–	–
AC 24 V	0...10 V	270 [1]	–	–	**STA63**	–	–
AC/DC 24 V (SSA81: AC 24 V)	3-position	–	150/300	30	–	**SSA81**	**SAY81P03**
	2-position/PDM	270	–	–	**STA73**	–	–
	0...10 V	–	34/70	30	–	**SSA61/SSA61EP**	**SAY61P03**
	Modbus	–	–	30	–	–	**SAY61P03/MO**

PN 25 1...120 °C	Without pressure testing points	With pressure testing points	DN	G [Inch]	$\dot{V}_{min}$ [l/h]	$\dot{V}_{100}$ [l/h]	Δp_{min} [kPa]	Δp_{max} [kPa]	Δp_{min} [kPa]	Δp_{max} [kPa]	Δp_{min} [kPa]	Δp_{max} [kPa]
Data sheet	N4855											
	VPP46.10L0.2	**VPP46.10L0.2Q**	10	½	30	200	16	600	16	600	–	–
	VPP46.10L0.4	**VPP46.10L0.4Q**	10	½	65	333	16	600	–	–	–	–
			10	½	65	370	–	–	16	600	–	–
	VPP46.15L0.2	**VPP46.15L0.2Q**	15	¾	30	200	19	600	19	600	–	–
	VPP46.15L0.6	**VPP46.15L0.6Q**	15	¾	100	575	19	600	19	600	–	–
	VPP46.20F1.4	**VPP46.20F1.4Q**	20	1	200	1190	22	600	–	–	–	–
			20	1	220	1330	–	–	22	600	–	–
	VPP46.25F1.8	**VPP46.25F1.8Q**	25	1 ¼	204	1470	39	600	–	–	–	–
			25	1 ¼	250	1800	–	–	39	600	–	–
	VPP46.32F4	**VPP46.32F4Q**	32	1 ½	450	3270	28	600	–	–	–	–
			32	1 ½	550	4001	–	–	28	600	–	–

PN 25 1...120 °C	Without pressure testing points	With pressure testing points	DN	Rp [Inch]	$\dot{V}_{min}$ [l/h]	$\dot{V}_{100}$ [l/h]	Δp_{min} [kPa]	Δp_{max} [kPa]	Δp_{min} [kPa]	Δp_{max} [kPa]	Δp_{min} [kPa]	Δp_{max} [kPa]
Data sheet	N4855											
	VPI46.15L0.2	**VPI46.15L0.2Q**	15	½	30	200	19	600	19	600	–	–
	VPI46.15L0.6	**VPI46.15L0.6Q**	15	½	100	575	19	600	19	600	–	–
	VPI46.20F1.4	**VPI46.20F1.4Q**	20	¾	200	1190	22	600	–	–	–	–
			20	¾	220	1330	–	–	22	600	–	–
	VPI46.25F1.8	**VPI46.25F1.8Q**	25	1 ¼	204	1470	39	600	–	–	–	–
			25	1 ¼	250	1800	–	–	39	600	–	–
	VPI46.32F4	**VPI46.32F4Q**	32	1 ½	450	3270	28	600	–	–	–	–
			32	1 ½	550	4001	–	–	28	600	–	–
	–	**VPI46.40F9.5Q**	40	1 ½	1370	9500	–	–	–	–	25	600
	–	**VPI46.50F12Q**	50	2	1400	11500	–	–	–	–	36	600

[1] In control mode (warm-up time) min. running time approx. 30 s/mm

[2] .. = insert $\dot{V}_{nom}$; $\dot{V}_{nom}$ = factory setting = volumetric flow at 0.5 mm stroke or setting mark 3 of the presetting

[3] Δp_{min} is valid for $\dot{V}_{Nom}$ 45 / 90 / 145 l/h; VPP46.. / VPI46..: Δp_{min} is for the $\dot{V}_{100}$. For lower flows please consult the data sheet.

Flanged PICVs

Typical applications	Actuators	Data sheet
– District heating	**SAX..P..**	N4509
– Heating groups	**SQV91P..**	N4833
– Air handling units	**SAV..P..**	N4510

							20 mm 500 N	20 / 40 mm 1100 N	40 mm 1100 N
									
Operating voltage	**Positioning signal**	**Positioning time [s]**			**Spring return function [s]**				
		SAX	SQV	SAV					
AC 230 V	3-position	30	–	120	–		**SAX31P03**	**–**	**SAV31P00**
	3-position	–	40/80	–	30		**–**	**SQV91P40** [1]	**–**
	3-position	–	40/80	–	30		**–**	**SQV91P30** [2]	**–**
AC/DC 24 V	3-position	30	–	120	–		**SAX81P03**	**–**	**SAV81P00**
	3-position	–	40/80	–	30		**–**	**SQV91P40** [1]	**–**
	3-position	–	40/80	–	30		**–**	**SQV91P30** [2]	**–**
	0...10 V, 4...20 mA	30	–	120	–		**SAX61P03**	**–**	**SAV61P00**
	0...10 V, 4...20 mA	–	40/80	–	30		**–**	**SQV91P40** [1]	**–**
	0...10 V, 4...20 mA	–	40/80	–	30		**–**	**SQV91P30** [2]	**–**
	Modbus	30	–	120	–		**SAX61P03/MO**	**–**	**SAV61P00/MO**

PN 16	1...120 °C	DN	$\dot{V}_{min}$ [m³/h]	$\dot{V}_{100}$ [m³/h]	Δp_{min} [kPa]	$\Delta p_s/\Delta p_{max}$ [kPa]	$\Delta p_s/\Delta p_{max}$ [kPa]	$\Delta p_s/\Delta p_{max}$ [kPa]
Data sheet	N4315							
	VPF43.50F16	50	2.3	15	20	600	600	–
	VPF43.50F25	50	4.3	25	50	600	600	–
	VPF43.65F24	65	4.4	24	25	600	600	–
	VPF43.65F35	65	6	35	55	600	600	–
	VPF43.80F35	80	5.3	34	25	600	600	–
	VPF43.80F45	80	7	43	50	600	600	–
	VPF43.100F70	100	12.1	68	35	–	600	600
	VPF43.100F90	100	14.8	90	75	–	600	600
	VPF43.125F110	125	18.5	110	35	–	600	600
	VPF43.125F135	125	23	135	53	–	600	600
	VPF43.150F160	150	25.6	148	35	–	600	600
	VPF43.150F200	150	32	195	65	–	600	600
	VPF43.200F210 [3]	200	95	210	32	–	600	600
	VPF43.200F280 [3]	200	130	280	78	–	600	600

PN 25	1...120 °C	DN	$\dot{V}_{min}$ [m³/h]	$\dot{V}_{100}$ [m³/h]	Δp_{min} [kPa]	$\Delta p_s/\Delta p_{max}$ [kPa]	$\Delta p_s/\Delta p_{max}$ [kPa]	$\Delta p_s/\Delta p_{max}$ [kPa]
Data sheet	N4316							
	VPF53.50F16	50	2.3	15	20	600	600	–
	VPF53.50F25	50	4.3	25	50	600	600	–
	VPF53.65F24	65	4.4	24	25	600	600	–
	VPF53.65F35	65	6	35	55	600	600	–
	VPF53.80F35	80	5.3	34	25	600	600	–
	VPF53.80F45	80	7	43	50	600	600	–
	VPF53.100F70	100	12.1	68	35	–	600	600
	VPF53.100F90	100	14.8	90	75	–	600	600
	VPF53.125F110	125	18.5	110	35	–	600	600
	VPF53.125F135	125	23	135	53	–	600	600
	VPF53.150F160	150	25.6	148	35	–	600	600
	VPF53.150F200	150	32	195	65	–	600	600
	VPF53.200F210 [3]	200	95	210	32	–	600	600
	VPF53.200F280 [3]	200	130	280	78	–	600	600

[1] Fail-safe function: valve closed
[2] Fail-safe function: valve open
[3] Max. medium temperature 110 °C
VPF43.. / VPF53..: Δp_{min} is for the $\dot{V}_{100}$. For lower flows please consult the data sheet.

Threaded globe valves

Typical applications	Actuators	Data sheet	RTN51/RTN51G	RTN71	RTN81
– Radiators	**RTN..**	N2111			

Typical applications	Actuators	Data sheet		4.5 mm 100 N	2.5 mm 100 N	4.5 mm 90 N
– Radiators	**STA..**	N4884				
	SSA..	N4893				
	Operating voltage	**Positioning signal**	**Positioning time [s]**			
	AC 230 V	2-position	210	**STA23**	–	**STA23HD** [1]
		3-position	150	–	**SSA31**	–
	AC 24 V	3-position	150	–	**SSA81**	–
		0...10 V	270 [2]	**STA63**	–	–
	AC/DC 24 V	2-position/PDM	270	**STA73**	–	**STA73HD** [1]
		0...10 V	34	–	**SSA61**	–
	Normally Open / Normally Closed (for radiator valves)			**NC**	–	**NC**

PN 10 1...120 °C	DIN	NF	DN	Rp/R [Inch]	k_v [m³/h]	Δp_{max} [kPa]	Δp_{max} [kPa]	Δp_{max} [kPa]
Data sheet	N2105	N2106						
	**VDN110**	**VDN210**	10	Rp/R ⅜	0.09...0.63	60	60	60
	VDN115	**VDN215**	15	Rp/R ½	0.10...0.89	60	60	60
	VDN120	**VDN220**	20	Rp/R ¾	0.31...1.41	60	60	60
	**VEN110**	**VEN210**	10	Rp/R ⅜	0.09...0.63	60	60	60
	VEN115	**VEN215**	15	Rp/R ½	0.10...0.89	60	60	60
	VEN120	**VEN220**	20	Rp/R ¾	0.31...1.41	60	60	60
	–	**VUN210**	10	Rp/R ⅜	0.14...0.60	60	60	60
	–	**VUN215**	15	Rp/R ½	0.13...0.77	60	60	60

Presettings for radiator valves VEN.., VDN.., VUN..

k_v values [m³/h] at the different preadjusted positions (XP = 2K)

Control range with electromotoric and electrothermic actuators SSA.., STA.. 	■	■	■	■	■	■	–
Control range with thermostatic head RTN.. 	■	■	■	■	■	■	■
Reference numbers for preadjustment	1	2	3	4	5	N	N (k_{vs})
VDN110/VDN210/VEN110/VEN210	0.072	0.17	0.24	0.28	0.37	0.43	0.63
VDN115/VDN215/VEN115/VEN215	0.07	0.17	0.28	0.36	0.45	0.50	0.89
VDN120/VDN220/VEN120/VEN220	0.22	0.35	0.44	0.52	0.60	0.71	1.41
VUN210	0.14	0.28	0.34	0.39	0.40	0.43	0.60
VUN215	0.13	0.22	0.30	0.39	0.45	0.50	0.77

Threaded globe valves

Typical applications	Actuators	Data sheet		4.5 mm 100 N	2.5 mm 100 N
– Chilled ceilings	**STA..**	N4884			
	SSA..	N4893			
	Operating voltage	**Positioning signal**	**Positioning time [s]**		
	AC 230 V	2-position	210	**STA23**	–
		3-position	150	–	**SSA31**
	AC 24 V	3-position	150	–	**SSA81**
		0...10 V	270 [2]	**STA63**	–
	AC/DC 24 V	2-position/PDM	270	**STA73**	–
		0...10 V	34	–	**SSA61**
	Normally Open / Normally Closed (for radiator valves)			**NC**	–

PN 10 1...110 °C		DN	Rp/R [Inch]	k_v [l/h]	Δp_{max} [kPa]	Δp_{max} [kPa]
Data sheet	N2103					
	**VD115CLC**	15	Rp/R ½	0.25...1.9	150	150
	VD120CLC	20	Rp/R ¾	0.25...2.6	150	150
	VD125CLC	25	Rp/R 1	0.25...2.6	150	150

[1] Optimized for floor heating systems

[2] In control mode (warm-up time) min. running time approx. 30 s/mm

k_v = nominal flow rate of cold water (5...30 °C) through the valve at the respective stroke and a differential pressure of 100 kPa (1 bar)

The selected k_v values of the radiator valves can be easily and precisely set on the valve head in 5 steps + N (fully open).

Threaded globe valves

Typical applications	Actuators	Data sheet			5.5 mm			
– Floor heating – Chilled ceilings – VAV – Fan coil units – Zone control	**SSB..**	N4891			200 N 		200 N 	
	Operating voltage	**Positioning signal**	**Positioning time [s]**	**Auxiliary switch** SSB..1.1				
	AC 230 V	3-position	150	✓	**SSB31**		**SSB31.1**	
	AC 24 V	3-position	150	✓	**SSB81**		**SSB81.1**	
	AC/DC 24 V	0...10 V	75	–	**SSB61**		–	

PN 16	1...110 °C	DN	G [Inch]	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	N4845							
	**VVP45.10-..** [1]	10	G ½B	0.25 / 0.4 / 0.63 / 1 / 1.6	725	400	725	400
	VVP45.15-2.5	15	G ¾B	2.5	350	350	350	350
	VVP45.20-4	20	G 1B	4	350	350	350	350
	VVP45.25-6.3	25	G 1¼B	6.3	300	300	300	300
	**VXP45.10-..**	10	G ½B	0.25 / 0.4 / 0.63 / 1 / 1.6	–	400	–	400
	VXP45.15-2.5	15	G ¾B	2.5	–	350	–	350
	VXP45.20-4	20	G 1B	4	–	350	–	350
	VXP45.25-6.3	25	G 1¼B	6.3	–	300	–	300
	**VMP45.10-..**	10	G ½B	0.25 / 0.4 / 0.63 / 1	–	400	–	400
	VMP45.10-1.6	10	G ½B	1.6	–	400	–	400
	VMP45.15-2.5	15	G ¾B	2.5	–	350	–	350
	VMP45.20-4	20	G 1B	4	–	350	–	350

Typical applications	Actuators	Data sheet			4.5 mm	2.5 mm	
– Chilled ceilings – VAV – Fan coil units	**STP..** **SFP..** **SSP..**	N4884 N4865 N4864			100 N 	135 N 	160 N 
	Operating voltage	**Positioning signal**	**Positioning time [s]**	**Spring return function [s]**			
	AC 230 V	2-position	210	–	**STP23**	–	–
		2-position	10	30...50	–	**SFP21/18**	–
		3-position	150	–	–	–	**SSP31**
	AC 24 V	2-position	10	30...50	–	**SFP71/18**	–
		3-position	43	–	–	–	**SSP81.04**
		3-position	150	–	–	–	**SSP81**
		0...10 V	270 [2]	–	**STP63**	–	–
	AC/DC 24 V	2-position/PDM	270	–	**STP73**	–	–
		0...10 V	34	–	–	–	**SSP61**

PN 16	1...110 °C	DN	G [Inch]	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	N4847									
	**VVP47.10-..** [1]	10	G ½B	0.25 / 0.4	700	400	1000	400	1000	400
	VVP47.10-..	10	G ½B	0.63 / 1	250	250	500	400	500	400
	VVP47.10-1.6	10	G ½B	1.6	150	150	300	300	300	300
	VVP47.15-2.5	15	G ¾B	2.5	150	150	300	300	300	300
	VVP47.20-4	20	G 1B	4	100	100	175	175	175	175
	**VXP47.10-..**	10	G ½B	0.25 / 0.4	–	400	–	400	–	400
	VXP47.10-..	10	G ½B	0.63 / 1	–	250	–	400	–	400
	VXP47.10-1.6	10	G ½B	1.6	–	150	–	300	–	300
	VXP47.15-2.5	15	G ¾B	2.5	–	150	–	300	–	300
	VXP47.20-4	20	G 1B	4	–	100	–	175	–	175
	**VMP47.10-..**	10	G ½B	0.25 / 0.4	–	400	–	400	–	400
	VMP47.10-..	10	G ½B	0.63 / 1	–	250	–	400	–	400
	VMP47.10-1.6	10	G ½B	1.6	–	150	–	300	–	300
	VMP47.15-2.5	15	G ¾B	2.5	–	150	–	300	–	300

Union nuts for threaded valves

Union nuts for threaded valves	**See page 14**

VVP45..N with Serto compression fittings, k_{vs} = 2.5 / 4 / 6.3 m³/h
VVP45..S, VMP45..S with Conex® compression fittings, k_{vs} = 0.63 / 1 / 1.6 / 2.5 m³/h
VVP47..S, VMP47..S with Conex® compression fittings, k_{vs} = 0.63 / 1 / 1.6 / 2.5 m³/h
[1] .. = k_{vs} value
[2] In control mode (warm-up time) min. running time approx. 30 s/mm

Threaded globe valves

Typical applications	Actuators	Data sheet
– Floor heating – Fan coil units – Zone control	**SFA..** **SUA21/3** **STA..** **SSA31.04** [1]	N4863 A6V10446174 N4884 N4860

Operating voltage	Positioning signal	Positioning time [s]	Spring return function [s]	2.5 mm 200 N	2.5 mm 170 N	4.5 mm 100 N	2.5 mm 160 N
AC 230 V	2-position	10	30...50	**SFA21/18**	–	–	–
	2-position	210	–	–	–	**STA23**	–
	2-position/SPST [2]	10	–	–	**SUA21/3**	–	–
	3-position/SPST [2]	43	–	–	–	–	**SSA31.04**
AC 24 V	2-position	10	30...50	**SFA71/18**	–	–	–
	0...10 V	270 [3]	–	–	–	**STA63**	–
AC/DC 24 V	2-position/PDM	270	–	–	–	**STA73**	–

PN 16	1...110 °C	DN	Rp [Inch]	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	A6V10421629											
	VVI46.15/2	15	Rp ½	2	300	300	400	400	200	200	200	200
	VVI46.20/2	20	Rp ¾	3.5	300	300	400	400	200	200	200	200
	VVI46.25/2	25	Rp 1	5	250	250	250	250	150	150	200	200
	VXI46.15/2 [4]	15	Rp ½	2	–	300	–	400	–	200	–	200
	VXI46.20/2 [4]	20	Rp ¾	3.5	–	300	–	400	–	200	–	200
	VXI46.25/2 [4]	25	Rp 1	5	–	250	–	250	–	150	–	200
	VXI46.25T [5]	25	Rp 1	5	–	200	–	200	–	200	–	200

Thermal actuators and connecting cables for combinable range, STx..3..

Color		White						Black
Equipped with		–	Function module DC 0...10 V		Auxiliary switch for STA	Auxiliary switch for STP	LED	–
Positioning signal		2-position (On/Off)	DC 0...10 V	DC 0...10 V	2-position (On/Off)	2-position (On/Off)	2-position (On/Off)	2-position (On/Off)
		[STA.., NC]	[STA.., NC]	–	[STA.., NC]	–	[STA.., NC]	[STA.., NC]
		[STP.., NO]	–	[STP.., NO]	–	[STP.., NO]	[STP.., NO]	[STP.., NO]
Standard PVC cables	1 m				**ASA23U10**	**ASP23U10**		
	2 m	**ASY23L20**	**ASY6AL20**	**ASY6PL20**			**ASY23L20LD**	
	3 m							**ASY23L30B**
	5 m	**ASY23L50**						**ASY23L50B**
	10 m	**ASY23L100**						
	15 m	**ASY23L150**						
Halogen-free cables	2 m	**ASY23L20HF**	**ASY6AL20HF**	**ASY6PL20HF**				
	5 m	**ASY23L50HF**						
	10 m	**ASY23L100HF**						

Actuator							
STA73/00	■	■		■		■	
STA23/00	■			■			
STP73/00	■		■		■	■	
STP23/00	■				■		
STA73PR/00 [6]	■			■		■	
STP73PR/00 [6]	■				■	■	
STA73MP/00 [7]	■	■		■		■	
STA23MP/00 [7]	■			■			
STA73B/00							■
STA23B/00							■

[1] Not suited for radiator valves
[2] SPST = single-pole single-throw, SPDT = single-pole double-throw
[3] In control mode (warm-up time) min. running time approx. 30 s/mm
[4] 70% k_{vs} in bypass, leakage rate in bypass 2...5% of k_{vs} value
[5] 100% k_{vs} in bypass, leakage rate in bypass 0.05% of k_{vs} value. **For noiseless operation, the value of 100 kPa should not be exceeded.**
[6] Actuators ideal for parallel running. Pulse duration modulation (PDM) in connection with Siemens room controllers of the Desigo™ range and room thermostats.
[7] Multipack with 50 actuators (OEM)

NC: Normally Closed, NO: Normally Open

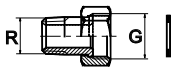
Threaded globe valves

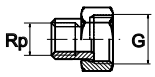
Typical applications	Actuators	Data sheet
– District heating – Boiler plants – Chiller plants – Domestic hot water – Heating groups – Air handling units	**SAX..** **SKD..** **SKB..**	N4501 N4561 N4564

Operating voltage	Positioning signal	Positioning time [s]			Spring return function [s]		800 N	1000 N	2800 N
		SAX	SKD	SKB	SKD	SKB	20 mm		
AC 230 V	3-position	120	120	120	–	–	**SAX31.00**	**SKD32.50**	**SKB32.50**
	3-position	–	120	120	8	10	**–**	**SKD32.51**	**SKB32.51**
	3-position	30	–	–	–	–	**SAX31.03**	**–**	**–**
	3-position	–	30	–	8	–	**–**	**SKD32.21**	**–**
AC 24 V [1]	3-position	120	120	120	–	–	**SAX81.00**	**SKD82.50**	**SKB82.50**
	3-position	–	120	120	8	10	**–**	**SKD82.51**	**SKB82.51**
	3-position	30	–	–	–	–	**SAX81.03**	**–**	**–**
	0...10 V, 4...20 mA	–	30	120	–	–	**–**	**SKD60**	**SKB60**
	0...10 V, 4...20 mA	–	30	120	15	10	**–**	**SKD62**	**SKB62**
AC/DC 24 V	0...10 V, 4...20 mA	30	–	–	–	–	**SAX61.03**	**–**	**–**
	Modbus	30	30	120	–	–	**SAX61.03/MO**	**SKD62/MO**	**SKB62/MO**

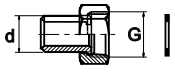
PN 16	-25...150 °C [2]			DN	G [Inch]	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	N4363		N4463									
	VVG41.11..12		–	–	15	G 1B	0.63 / 1	1600	800	1600	800	1600	800
	VVG41.13		–	**VXG41.1301**	15	G 1B	1.6	1600	800	1600	800	1600	800
	VVG41.14		–	**VXG41.1401**	15	G 1B	2.5	1600	800	1600	800	1600	800
	**VVG41.15**		**VXG41.15**	**VXG41.1501**	15	G 1B	4	1600	800	1600	800	1600	800
	VVG41.20		**VXG41.20**	**VXG41.2001**	20	G 11/4B	6.3	1600	800	1600	800	1600	800
	VVG41.25		**VXG41.25**	**VXG41.2501**	25	G 11/2B	10	1550	800	1600	800	1600	800
	VVG41.32		**VXG41.32**	**VXG41.3201**	32	G 2B	16	875	800	1275	800	1600	800
	VVG41.40		**VXG41.40**	**VXG41.4001**	40	G 21/4B	25	525	525	775	775	1600	800
	VVG41.50		**VXG41.50**	**VXG41.5001**	50	G 23/4B	40	300	300	450	450	1225	800

Union nuts for threaded valves [3]





Type		G [Inch]	R, Rp [Inch]	Material
Set of 2	Set of 3			
ALG132	**ALG133**	G ½B	R ⅜ (Außengewinde)	Brass
ALG142	**ALG143**	G ¾B	R ½ (Außengewinde)	Brass
ALG122	**ALG123**	G ¾B	Rp ⅜	Malleable cast iron
ALG152	**ALG153**	G 1B	Rp ½	Malleable cast iron
ALG152B	**ALG153B**	G 1B	Rp ½	Brass
ALG202	**ALG203**	G 1¼B	Rp ¾	Malleable cast iron
ALG202B	**ALG203B**	G 1¼B	Rp ¾	Brass
ALG252	**ALG253**	G 1½B	Rp 1	Malleable cast iron
ALG252B	**ALG253B**	G 1½B	Rp 1	Brass
ALG322	**ALG323**	G 2B	Rp 1¼	Malleable cast iron
ALG322B	**ALG323B**	G 2B	Rp 1¼	Brass
ALG402	**ALG403**	G 2¼B	Rp 1½	Malleable cast iron
ALG402B	**ALG403B**	G 2¼B	Rp 1½	Brass
ALG502	**ALG503**	G 2¾B	Rp 2	Malleable cast iron
ALG502B	**ALG503B**	G 2¾B	Rp 2	Brass



Type	G [Inch]	Ø d [mm]	Material
Set of 2			
ALS152	G ¾B	21,3	Steel, weldable
ALS202	G 1B	26,8	Steel, weldable
ALS252	G 1¼B	33,7	Steel, weldable

[1] SAX81..: AC/DC 24 V
[2] SAX.. max. 130 °C
[3] Valve side: cylindrical thread G according to ISO 228-1, pipe side: ALG.. with cylindrical Rp- or tapered R-thread according to ISO 7-1, pipe side: ALS.. with welded connection
VXG41.. valves contain only materials in contact with drinking water that comply with the UBA Positive List dated April 23, 2013, Categories B+C

Threaded globe valves

Typical applications
– Boiler plants
– Domestic hot water
– Heating groups
– Air handling unit

Actuators	Data sheet			5.5 mm		
SAS..	N4581			400 N	400 N	400 N
Operating voltage	**Positioning signal**	**Positioning time [s]**	**Spring return function [s]**			
AC 230 V	3-position	120	–	**SAS31.00**	–	–
	3-position	30	–	**SAS31.03**	–	–
	3-position	120	28	–	**SAS31.50**	–
	3-position	30	14	–	**SAS31.53**	–
AC/DC 24 V	0...10 V, 4...20 mA, 0...1000 Ω	30	–	**SAS61.03**	–	–
		30	14	–	–	**SAS61.33**
		30	14	–	**SAS61.53**	–
	3-position	120	–	**SAS81.00**	–	–
	3-position	30	–	**SAS81.03**	–	–
	3-position	30	14	–	–	**SAS81.33**
	Modbus	30	–	**SAS61.03/MO**	**SAS61.33/MO**	–

PN 16	1...120 °C			DN	G [Inch]	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	N4364		N4464									
	**VVG44.15-..** [1]		**VXG44.15-..**	15	G 1B	0.25 / 0.4 / 0.63	1600	400	1600	400	1600	400
	VVG44.15-..		**VXG44.15-..**	15	G 1B	1 / 1.6	725	400	725	400	725	400
	VVG44.15-..		**VXG44.15-..**	15	G 1B	2.5 / 4	400	400	400	400	400	400
	VVG44.20-6.3		**VXG44.20-6.3**	20	G 1¼B	6.3	750	400	750	400	750	400
	VVG44.25-10		**VXG44.25-10**	25	G 1½B	10	400	400	400	400	400	400
	VVG44.32-16		**VXG44.32-16**	32	G 2B	16	250	250	250	250	250	250
	VVG44.40-25		**VXG44.40-25**	40	G 2¼B	25	125	125	125	125	125	125

Typical applications
– Boiler plants
– Heating groups
– Air handling units

Actuators	Data sheet			5.5 mm
SSC..	N4895			300 N
Operating voltage	**Position-ing signal**	**Positioning time [s]**	**Spring return function [s]**	
AC 230 V	3-position	150	–	**SSC31**
AC 24 V	3-position	150	–	**SSC81**
AC/DC 24 V	0...10 V	30	–	**SSC61**
	0...10 V	30	30	**SSC61.5**

PN 16	1...110 °C			DN	G [Inch]	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	N4845		N4845					
	**VVP45.20-4**		**VXP45.20-4**	20	G 1B	4	350	350
	VVP45.25-6.3		**VXP45.25-6.3**	25	G 1¼B	6.3	300	300
	VVP45.25-10		**VXP45.25-10**	25	G 1½B	10	300	300
	VVP45.32-16		**VXP45.32-16**	32	G 2B	16	175	175
	VVP45.40-25		**VXP45.40-25**	40	G 2¼B	25	75	75

Typical applications
– District heating
– Boiler plants

Actuators	Data sheet			5.5 mm	
SAT..	N4584			300 N	300 N
Operating voltage	**Position-ing signal**	**Positioning time [s]**	**Spring return function [s]**		
AC 230 V	3-position	8	–	**SAT31.008**	–
	3-position	15	8	–	**SAT31.51**
AC/DC 24 V	0...10 V, 4...20 mA, 0...1000 Ω	8	–	**SAT61.008**	–
		15	8	–	**SAT61.51**
	Modbus	15	–	**SAT61.008/MO**	**SAT61.51/MO**

PN 25	1...130 °C	DN	G [Inch]	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	N4380							
	**VVG549.15-..** [1]	15	G ¾B	0.25 / 0.4 / 0.63	2500	1200	2500	1200
	VVG549.15-..	15	G 3¾B	1 / 1.6 / 2.5	2000	1200	2000	1200
	VVG549.20-4K	20	G 1B	4	1600	1200	1600	1200
	VVG549.25-6.3K	25	G 1¼B	6.3	1600	1200	1600	1200

[1] .. = insert k_{vs} value

Flanged globe valves

Typical applications	Actuators	Data sheet
– District heating	**SAX..**	N4501
– Boiler plants	**SKD..**	N4561
– Chiller plants	**SKB..**	N4564
– Domestic hot water	**SKC..**	N4566
– Heating groups	**SAV..**	CE1N4503
– Air handling units		

Operating voltage	Positioning signal	Positioning time [s] SA..	SKD	SKB/C	Spring return function [s] SKD	SKB/C	20 mm 800 N	20 mm 1000 N	20 mm 2800 N	40 mm 1600 N	40 mm 2800 N
											
AC 230 V	3-position	120	120	120	–	–	**SAX31.00**	**SKD32.50**	**SKB32.50**	**SAV31.00**	**SKC32.60**
	3-position	–	120	120	8	10/18	**–**	**SKD32.51**	**SKB32.51**	**–**	**SKC32.61**
	3-position	30	–	–	–	–	**SAX31.03**	**–**	**–**	**–**	**–**
	3-position	–	30	–	8	–	**–**	**SKD32.21**	**–**	**–**	**–**
AC 24 V [1]	3-position	120	120	120	–	–	**SAX81.00**	**SKD82.50**	**SKB82.50**	**SAV81.00**	**SKC82.60**
	3-position	–	120	120	8	10/18	**–**	**SKD82.51**	**SKB82.51**	**–**	**SKC82.61**
	3-position	30	–	–	–	–	**SAX81.03**	**–**	**–**	**–**	**–**
	0...10 V, 4...20 mA	–	30	120	–	–	**–**	**SKD60**	**SKB60**	**–**	**SKC60**
	0...10 V, 4...20 mA	–	30	120	15	10/20	**–**	**SKD62**	**SKB62**	**–**	**SKC62**
AC/DC 24 V	0...10 V, 4...20 mA	30	–	–	–	–	**SAX61.03**	**–**	**–**	**–**	**–**
	0...10 V, 4...20 mA	120	–	–	–	–	**–**	**–**	**–**	**SAV61.00**	**–**
	Modbus	30	30	120	15	10/20	**SAX61.03/MO**	**SKD62/MO**	**SKB62/MO**	**–**	**SKC62/MO**

PN 6 -10...130 °C				DN	k_{vs} [m³/h]	20 mm 800 N Δp_s [kPa]	20 mm 800 N Δp_{max} [kPa]	20 mm 1000 N Δp_s [kPa]	20 mm 1000 N Δp_{max} [kPa]	20 mm 2800 N Δp_s [kPa]	20 mm 2800 N Δp_{max} [kPa]	40 mm 1600 N Δp_s [kPa]	40 mm 1600 N Δp_{max} [kPa]	40 mm 2800 N Δp_s [kPa]	40 mm 2800 N Δp_{max} [kPa]
Data sheet	N4401		N4401												
	VVF22.25-.. [2]		**VXF22.25-..**	25	2.5 / 4 / 6.3 / 10	600	300	600	300	600	300	–	–	–	–
	VVF22.40-..		**VXF22.40-..**	40	16 / 25	550	300	600	300	600	300	600	300	–	–
	VVF22.50-40		**VXF22.50-40**	50	40	350	300	450	300	600	300	600	300	–	–
	VVF22.65-63		**VXF22.65-63**	65	63	200	150	250	200	600	300	450	300	–	–
	VVF22.80-100		**VXF22.80-100**	80	100	125	75	175	125	450	300	250	225	–	–
	VVF22.100-160		**VXF22.100-160**	100	160	–	–	–	–	–	–	160	125	300	250
PN 10 -10...150 °C [3]				DN	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	N4402		N4402												
	VVF32.15-.. [2]		**VXF32.15-..**	15	1.6 / 2.5 / 4	1000	400	1000	400	1000	400	–	–	–	–
	VVF32.25-..		**VXF32.25-..**	25	6.3 / 10	1000	400	1000	400	1000	400	–	–	–	–
	VVF32.40-..		**VXF32.40-..**	40	16 / 25	550	400	750	400	1000	400	1000	400	–	–
	VVF32.50-40		**VXF32.50-40**	50	40	350	300	450	400	1000	400	750	400	–	–
	VVF32.65-63		**VXF32.65-63**	65	63	200	150	250	200	700	400	450	400	–	–
	VVF32.80-100		**VXF32.80-100**	80	100	125	75	175	125	450	400	250	225	–	–
	VVF32.100-160		**VXF32.100-160**	100	160	–	–	–	–	–	–	160	125	300	250
	VVF32.125-250		**VXF32.125-250**	125	250	–	–	–	–	–	–	125	90	190	160
	VVF32.150-400		**VXF32.150-400**	150	400	–	–	–	–	–	–	80	60	125	100
PN 16 -10...150 °C [3]				DN	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	N4403		N4403												
	VVF42.15-.. [2]		**VXF42.15-..**	15	1.6 / 2.5 / 4	1600	400	1600	400	1600	400	–	–	–	–
	VVF42.20-6.3		**VXF42.20-6.3**	20	6.3	1600	400	1600	400	1600	400	–	–	–	–
	VVF42.25-..		**VXF42.25-..**	25	6.3 / 10	1600	400	1600	400	1600	400	–	–	–	–
	VVF42.32-16		**VXF42.32-16**	32	16	900	400	1200	400	1600	400	–	–	–	–
	VVF42.40-..		**VXF42.40-..**	40	16 / 25	550	400	750	400	1600	400	1250	400	–	–
	VVF42.50-..		**VXF42.50-..**	50	31.5 / 40	350	300	450	400	1200	400	750	400	–	–
	VVF42.65-..		**VXF42.65-..**	65	50 / 63	200	150	250	200	700	400	450	400	–	–
	VVF42.80-..		**VXF42.80-..**	80	80 / 100	125	75	175	125	450	400	250	225	–	–
	VVF42.100-..		**VXF42.100-..**	100	125 / 160	–	–	–	–	–	–	160	125	300	250
	VVF42.125-..		**VXF42.125-..**	125	200 / 250	–	–	–	–	–	–	125	90	190	160
	VVF42.150-..		**VXF42.150-..**	150	315 / 400	–	–	–	–	–	–	80	60	125	100
	VVF42.50-40K		**–**	50	40	1600	400	1600	400	1600	400	–	–	–	–
	VVF42.65-63K		**–**	65	63	1600	400	1600	400	1600	400	–	–	–	–
	VVF42.80-100K		**–**	80	100	1600	400	1600	400	1600	400	–	–	–	–
	VVF42.100-160K		**–**	100	160	–	–	–	–	–	–	1600	400	1600	400
	VVF42.125-250K		**–**	125	250	–	–	–	–	–	–	1600	400	1600	400
	VVF42.150-360K		**–**	150	360	–	–	–	–	–	–	1600	400	1600	400
PN 16 -20...220 °C				DN	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	N4404		N4404												
	VVF43.65-50		**VXF43.65-50**	65	50	–	–	–	–	–	–	450	400	700	650
	VVF43.65-63		**VXF43.65-63**	65	63	–	–	–	–	–	–	450	400	700	650
	VVF43.80-80		**VXF43.80-80**	80	80	–	–	–	–	–	–	250	225	450	400
	VVF43.80-100		**VXF43.80-100**	80	100	–	–	–	–	–	–	250	225	450	400
	VVF43.100-125		**VXF43.100-125**	100	125	–	–	–	–	–	–	160	125	300	250
	VVF43.100-160		**VXF43.100-160**	100	160	–	–	–	–	–	–	160	125	300	250
	VVF43.125-200		**VXF43.125-200**	125	200	–	–	–	–	–	–	125	90	190	160
	VVF43.125-250		**VXF43.125-250**	125	250	–	–	–	–	–	–	125	90	190	160
	VVF43.150-315		**VXF43.150-315**	150	315	–	–	–	–	–	–	80	60	125	100
	VVF43.150-400		**VXF43.150-400**	150	400	–	–	–	–	–	–	80	60	125	100
	VVF43.65-63K		**–**	65	63	–	–	–	–	–	–	–	–	1600	800
	VVF43.80-100K		**–**	80	100	–	–	–	–	–	–	–	–	1600	800
	VVF43.100-150K		**–**	100	150	–	–	–	–	–	–	–	–	1600	800
	VVF43.125-220K		**–**	125	220	–	–	–	–	–	–	–	–	1600	800
	VVF43.150-315K		**–**	150	315	–	–	–	–	–	–	–	–	1600	800
	VVF43.200-450K		**–**	200	450	–	–	–	–	–	–	–	–	1200	800
	VVF43.250-630K		**–**	250	630	–	–	–	–	–	–	–	–	1000	800

[1] SAX81..: AC/DC 24 V

[2] .. = insert k_{vs} value

[3] SAX.. max. 130 °C; VVF43.., VXF43..: For DN 15...50 and k_{vs} values ≤ 40 m³/h see V..F53..

Flanged globe valves

Typical applications
– District heating
– Boiler plants
– Chiller plants
– Domestic hot water
– Heating groups
– Air handling units

Actuators	Data sheet
SAX..	N4501
SKD..	N4561
SKB..	N4564
SKC..	N4566
SAV..	CE1N4503

Operating voltage	Positioning signal	Positioning time [s]		Spring return function [s]		20 mm			40 mm	
		SKD	SKB/C	SKD	SKB/C	800 N	1000 N	2800 N	1600 N	2800 N
AC 230 V	3-position	120	120	–	–	**SAX31.00**	**SKD32.50**	**SKB32.50**	**SAV31.00**	**SKC32.60**
	3-position	120	120	8	10/18	–	**SKD32.51**	**SKB32.51**	–	**SKC32.61**
	3-position	–	–	–	–	**SAX31.03**	–	–	–	–
	3-position	30	–	8	–	–	**SKD32.21**	–	**SAV81.00**	–
AC 24 V	3-position	120	120	–	–	**SAX81.00**	**SKD82.50**	**SKB82.50**	–	**SKC82.60**
	3-position	120	120	8	10/18	–	**SKD82.51**	**SKB82.51**	–	**SKC82.61**
	3-position	–	–	–	–	**SAX81.03**	–	–	–	–
	0...10 V, 4...20 mA	30	120	–	–	–	**SKD60**	**SKB60**	–	**SKC60**
	0...10 V, 4...20 mA	30	120	15	10/20	–	**SKD62**	**SKB62**	–	**SKC62**
AC/DC 24 V	0...10 V, 4...20 mA	–	–	–	–	**SAX61.03**	–	–	–	–
	0...10 V, 4...20 mA	–	–	–	–	–	–	–	**SAV61.00**	–
	Modbus	30	120	–	–	**SAX61.03/MO**	**SKD62/MO**	**SKB62/MO**	**SAV61.00/MO**	**SKC62/MO**

PN 25	-20...220 °C [2]			DN	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	N4405		N4405												
	VVF53.15-.. [3]		–	15	0.16 / 0.2 / 0.25 / 0.32 / 0.4 / 0.5 / 0.63	2500	1200	2500	1200	2500	1200	–	–	–	–
	VVF53.15-..		–	15	0.8 / 1 / 1.25 / 2 / 3.2	2500	1200	2500	1200	2500	1200	–	–	–	–
	VVF53.15-..		**VXF53.15-..**	15	1.6 / 2.5 / 4	2500	1200	2500	1200	2500	1200	–	–	–	–
	VVF53.20-6.3		**VXF53.20-6.3**	20	6.3	2500	1200	2500	1200	2500	1200	–	–	–	–
	VVF53.25-..		–	25	5 / 8	1600	1200	2100	1200	2500	1200	–	–	–	–
	VVF53.25-..		**VXF53.25-..**	25	6.3 / 10	1600	1200	2100	1200	2500	1200	–	–	–	–
	VVF53.32-16		**VXF53.32-16**	32	16	900	750	1200	1100	2500	1200	–	–	–	–
	VVF53.40-..		–	40	12.5 / 20	550	500	750	650	2000	1200	–	–	–	–
	VVF53.40-..		**VXF53.40-..**	40	16 / 25	550	500	750	650	2000	1200	1250	1150	–	–
	VVF53.50-31.5		–	50	31.5	350	300	450	400	1200	1150	1250	1150	–	–
	VVF53.50-40		**VXF53.50-40**	50	40	350	300	450	400	1200	1150	750	700	–	–
	VVF53.65-63		**VXF53.65-63**	65	63	–	–	–	–	–	–	750	700	700	650
	VVF53.80-100		**VXF53.80-100**	80	100	–	–	–	–	–	–	450	400	450	400
	VVF53.100-160		**VXF53.100-160**	100	160	–	–	–	–	–	–	250	225	300	250
	VVF53.125-250		**VXF53.125-250**	125	250	–	–	–	–	–	–	160	125	190	160
	VVF53.150-400		**VXF53.150-400**	150	400	–	–	–	–	–	–	125	90	125	100
	VVF53.50-40K		–	50	36	–	–	2500	1250	2500	1250	80	60	–	–
	VVF53.65-63K		–	65	63	–	–	–	–	–	–	–	–	2500	1250
	VVF53.80-100K		–	80	100	–	–	–	–	–	–	–	–	2500	1250
	VVF53.100-150K		–	100	150	–	–	–	–	–	–	–	–	2500	1250
	VVF53.125-220K		–	125	220	–	–	–	–	–	–	–	–	2500	1250
	VVF53.150-315K		–	150	315	–	–	–	–	–	–	–	–	2500	1250
	VVF53.200-450K		–	200	450	–	–	–	–	–	–	–	–	1200	800
	VVF53.250-630K		–	250	630	–	–	–	–	–	–	–	–	1200	800

PN 40	-25...220 °C	DN	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	A6V11459527												
	VVF63.15-0.2	15	0.2	–	–	4000	2000	4000	2000	–	–	–	–
	VVF63.15-0.32	15	0.32	–	–	4000	2000	4000	2000	–	–	–	–
	VVF63.15-0.5	15	0.5	–	–	4000	2000	4000	2000	–	–	–	–
	VVF63.15-0.8	15	0.8	–	–	4000	2000	4000	2000	–	–	–	–
	VVF63.15-1.25	15	1.25	–	–	4000	2000	4000	2000	–	–	–	–
	VVF63.15-2	15	2	–	–	4000	2000	4000	2000	–	–	–	–
	VVF63.15-3.2	15	3.2	–	–	4000	2000	4000	2000	–	–	–	–
	VVF63.20-6.3	20	5	–	–	3500	2000	4000	2000	–	–	–	–
	VVF63.25-5	25	5	–	–	2100	2000	4000	2000	–	–	–	–
	VVF63.25-8	25	8	–	–	2100	2000	4000	2000	–	–	–	–
	VVF63.32-16	32	15	–	–	1200	1100	3200	2000	–	–	–	–
	VVF63.40-12.5	40	12.5	–	–	750	650	2000	1800	–	–	–	–
	VVF63.40-20	40	20	–	–	750	650	2000	1800	–	–	–	–
	VVF63.50-31.5	50	31.5	–	–	450	400	1200	1150	–	–	–	–
	VVF63.65-50	65	50	–	–	–	–	–	–	–	–	700	650
	VVF63.80-80	80	80	–	–	–	–	–	–	–	–	450	400
	VVF63.100-125	100	125	–	–	–	–	–	–	–	–	300	250
	VVF63.125-200	125	200	–	–	–	–	–	–	–	–	175	160
	VVF63.150-280	150	280	–	–	–	–	–	–	–	–	125	100

[1] SAX81..: AC/DC 24 V
[2] SAX.. max. 130 °C
[3] .. = insert k_{vs} value

Flanged globe valves

Typical applications
- District heating
- Boiler plants
- Chiller plants
- Domestic hot water
- Heating groups
- Air handling units

Actuators	Data sheet
SKD..	**N4561**
SKB..	**N4564**
SKC..	**N4566**

Operating voltage	Positioning signal	Positioning time [s] SKD	Positioning time [s] SKB/C	Spring return function [s] SKD	Spring return function [s] SKB/C	20 mm 1000 N	20 mm 2800 N	40 mm 2800 N
								
AC 230 V	3-position	120	120	–	–	**SKD32.50**	**SKB32.50**	**SKC32.60**
	3-position	120	120	8	10/18	**SKD32.51**	**SKB32.51**	**SKC32.61**
	3-position	30	–	8	–	**SKD32.21**	**–**	**–**
AC 24 V	3-position	120	120	–	–	**SKD82.50**	**SKB82.50**	**SKC82.60**
	3-position	120	120	8	10/18	**SKD82.51**	**SKB82.51**	**SKC82.61**
	0...10 V, 4...20 mA	30	120	–	–	**SKD60**	**SKB60**	**SKC60**
	0...10 V, 4...20 mA	30	120	15	10/20	**SKD62**	**SKB62**	**SKC62**
	Modbus	30	120	–	–	**SKD62/MO**	**SKB62/MO**	**SKC62/MO**

PN 40	-25...220 °C	DN	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	A6V11459527								
VVF63.50-40K		50	36	–	1500	4000	2000	–	–
VVF63.65-63K		65	63	–	–	–	–	4000	2000
VVF63.80-100K		80	100	–	–	–	–	4000	2000
VVF63.100-150K		100	150	–	–	–	–	4000	2000
VVF63.125-220K		125	220	–	–	–	–	4000	2000
VVF63.150-315K		150	315	–	–	–	–	4000	2000

PN 40	-25...220 °C	DN	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	A6V11459527								
VXF63.15-1.6		15	1.6	2000	200	2000	200	–	–
VXF63.15-2.5		15	2.5	2000	200	2000	200	–	–
VXF63.15-4		15	4	2000	200	2000	200	–	–
VXF63.20-6.3		20	6.3	2000	200	2000	200	–	–
VXF63.25-6.3		25	6.3	2000	200	2000	200	–	–
VXF63.25-10		25	10	2000	200	2000	200	–	–
VXF63.32-16		32	16	1100	200	2000	200	–	–
VXF63.40-16		40	16	650	200	2000	200	–	–
VXF63.40-25		40	25	650	200	2000	200	–	–
VXF63.50-31.5		50	31.5	400	200	1150	200	–	–
VXF63.65-50		65	50	–	–	–	–	650	200
VXF63.80-80		80	80	–	–	–	–	400	200
VXF63.100-125		100	125	–	–	–	–	250	150
VXF63.125-200		125	200	–	–	–	–	160	100
VXF63.150-315		150	315	–	–	–	–	100	70

Control ball valves

Typical applications	Actuators	Data sheet
– Domestic hot water	**GQD..9A**	N4659
– Heating groups	**GSD..9A**	A6V10636056
– Air handling units	**GDB..9E**	A6V10636150
– Chilled ceilings	**GDB111.9E/KN**	A6V10725318
– VAV	**GMA..9E**	N4658
– Fan coil units	**GLB..9E**	A6V10636203
– Zone control	**GLD..9E**	A6V11171770

Operating voltage	Positioning signal	Positioning time [s]			Spring return function [s]	2 Nm	5 Nm	7 Nm	10 Nm GLB 8 Nm GLD
		G..D	G..B	GMA					
AC 100...240 V	2/3-position	–	150	–	–	–	**GDB341.9E**	–	**GLB341.9E**
AC 24 V	KNX S-/LTE-Mode, KNX PL-Link	–	150	–	–	–	**GDB111.9E/KN**	–	**GLB111.9E/KN**
	Modbus	–	150	–	–	–	–	–	**GLB111.9E/MO**
AC/DC 24 V	3-position	30	–	90	15	**GQD131.9A**	–	**GMA131.9E**	–
	2/3-position	–	150	–	–	–	**GDB141.9E**	–	**GLB141.9E**
	0...10 V	30	–	90	15	**GQD161.9A**	–	**GMA161.9E**	–
	0/2...10 V	30	150	–	–	**GSD161.9A**	**GDB161.9E**	–	**GLB161.9E**
	0/2...10 V	30	–	–	–	–	–	–	**GLD161.9E**

PN 40	-10...120 °C			DN	G [Inch]	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	N4211		N4211											
	VAG61.15-..[1]		**VBG61.15-..**	15	G 1B	1.6/2.5/4/6.3	1400	350	1400	350	1400	350	1400	350
	VAG61.15-..		–	15	G 1B	1	1400	350	1400	350	1400	350	1400	350
	VAG61.20-..		**VBG61.20-..**	20	G 1¼B	4/6.3	1400	350	1400	350	1400	350	1400	350
	VAG61.20-10		–	20	G 1¼B	10	1400	350	1400	350	1400	350	1400	350
	VAG61.25-10		**VBG61.25-10**	25	G 1½B	10	1400	350	1400	350	1400	350	1400	350
	VAG61.25-..		–	25	G 1½B	6.3/16	1400	350	1400	350	1400	350	1400	350
	VAG61.32-10		–	32	G 2B	10	–	–	–	–	1000	350	1000	350
	VAG61.32-16		**VBG61.32-16**	32	G 2B	16	–	–	–	–	1000	350	1000	350
	VAG61.32-25		–	32	G 2B	25	–	–	–	–	1000	350	1000	350
	VAG61.40-16		–	40	G 2¼B	16	–	–	–	–	800	350	800	350
	VAG61.40-25		**VBG61.40-25**	40	G 2¼B	25	–	–	–	–	800	350	800	350
	VAG61.40-40		–	40	G 2¼B	40	–	–	–	–	800	350	800	350
	VAG61.50-25		–	50	G 2¾B	25	–	–	–	–	600	350	600	350
	VAG61.50-40		**VBG61.50-40**	50	G 2¾B	40	–	–	–	–	600	350	600	350
	VAG61.50-63		–	50	G 2¾B	63	–	–	–	–	600	350	600	350

PN 40	-10...120 °C			DN	Rp [Inch]	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	N4211		N4211											
	VAI61.15-..[1]		**VBI61.15-..**	15	Rp ½	1.6/2.5/4/6.3	1400	350	1400	350	1400	350	1400	350
	VAI61.15-..		–	15	Rp ½	1/10	1400	350	1400	350	1400	350	1400	350
	VAI61.20-..		**VBI61.20-..**	20	Rp ¾	4/6.3	1400	350	1400	350	1400	350	1400	350
	VAI61.20-10		–	20	Rp ¾	10	1400	350	1400	350	1400	350	1400	350
	VAI61.25-10		**VBI61.25-10**	25	Rp 1	10	1400	350	1400	350	1400	350	1400	350
	VAI61.25-..		–	25	Rp 1	6.3/16	1400	350	1400	350	1400	350	1400	350
	VAI61.32-10		–	32	Rp 1¼	10	–	–	–	–	1000	350	1000	350
	VAI61.32-16		**VBI61.32-16**	32	Rp 1¼	16	–	–	–	–	1000	350	1000	350
	VAI61.32-25		–	32	Rp 1¼	25	–	–	–	–	1000	350	1000	350
	VAI61.40-16		–	40	Rp 1½	16	–	–	–	–	800	350	800	350
	VAI61.40-25		**VBI61.40-25**	40	Rp 1½	25	–	–	–	–	800	350	800	350
	VAI61.40-40		–	40	Rp 1½	40	–	–	–	–	800	350	800	350
	VAI61.50-25		–	50	Rp 2	25	–	–	–	–	600	350	600	350
	VAI61.50-40		**VBI61.50-40**	50	Rp 2	40	–	–	–	–	600	350	600	350
	VAI61.50-63		**VBI61.50-63**	50	Rp 2	63	–	–	–	–	600	350	600	350

[1] .. = insert k_{vs} value; VBG61../VBI61..: For noiseless operation, the Δp_{max} value of 200 kPa should not be exceeded

6-port control ball valves

Typical applications	Actuators	Data sheet
– Heated and chilled ceilings	**GSD..9A**	A6V10636056
	GDB..9E	A6V10636150
	GDB111.9E/KN	A6V10725318

Operating voltage	Positioning signal	Positioning time [s]		2 Nm	5 Nm	5 Nm	5 Nm	10 Nm
		GSD	G..B					
AC 100...240 V	2-position	–	150	–	**GDB341.9E**	–	–	–
AC 230 V	2-position	90	–	**GSD341.9A**	–	–	–	–
AC 24 V	KNX S-/LTE-Mode, KNX PL-Link	–	150	–	–	**GDB111.9E/KN**	–	–
AC/DC 24 V	2-position	30	150	**GSD141.9A**	**GDB141.9E**	–	–	–
	0/2...10 V	30	150	**GSD161.9A**	–	–	**GDB161.9E**	–
	Modbus	–	150	–	–	–	–	**GLB111.9E/MO**

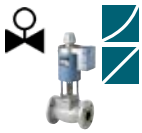
PN 16	5...90 °C	DN	k_{vs} left	k_{vs} right	Δp_s	Δp_{max}	Δp_s	Δp_{max}	Δp_s	Δp_{max}	Δp_s	Δp_{max}	Δp_s	Δp_{max}
Data sheet	A6V10564480		[m³/h]	[m³/h]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]
VWG41.10-0.25-0.4		10	0.25	0.4	–	200	–	200	–	200	–	200	–	200
VWG41.10-0.25-0.65		10	0.25	0.65	–	200	–	200	–	200	–	200	–	200
VWG41.10-0.25-1.0		10	0.25	1	–	200	–	200	–	200	–	200	–	200
VWG41.10-0.25-1.3		10	0.25	1.3	–	200	–	200	–	200	–	200	–	200
VWG41.10-0.25-1.6		10	0.25	1.6	–	200	–	200	–	200	–	200	–	200
VWG41.10-0.25-1.9		10	0.25	1.9	–	200	–	200	–	200	–	200	–	200
VWG41.10-0.4-0.4		10	0.4	0.4	–	200	–	200	–	200	–	200	–	200
VWG41.10-0.4-0.65		10	0.4	0.65	–	200	–	200	–	200	–	200	–	200
VWG41.10-0.4-1.0		10	0.4	1	–	200	–	200	–	200	–	200	–	200
VWG41.10-0.4-1.3		10	0.4	1.3	–	200	–	200	–	200	–	200	–	200
VWG41.10-0.4-1.6		10	0.4	1.6	–	200	–	200	–	200	–	200	–	200
VWG41.10-0.4-1.9		10	0.4	1.9	–	200	–	200	–	200	–	200	–	200
VWG41.10-0.65-0.65		10	0.65	0.65	–	200	–	200	–	200	–	200	–	200
VWG41.10-0.65-1.0		10	0.65	1	–	200	–	200	–	200	–	200	–	200
VWG41.10-0.65-1.3		10	0.65	1.3	–	200	–	200	–	200	–	200	–	200
VWG41.10-0.65-1.6		10	0.65	1.6	–	200	–	200	–	200	–	200	–	200
VWG41.10-0.65-1.9		10	0.65	1.9	–	200	–	200	–	200	–	200	–	200
VWG41.10-1.0-1.0		10	1	1	–	200	–	200	–	200	–	200	–	200
VWG41.10-1.0-1.3		10	1	1.3	–	200	–	200	–	200	–	200	–	200
VWG41.10-1.0-1.6		10	1	1.6	–	200	–	200	–	200	–	200	–	200
VWG41.10-1.0-1.9		10	1	1.9	–	200	–	200	–	200	–	200	–	200
VWG41.10-1.3-1.3		10	1.3	1.3	–	200	–	200	–	200	–	200	–	200
VWG41.10-1.3-1.6		10	1.3	1.6	–	200	–	200	–	200	–	200	–	200
VWG41.10-1.3-1.9		10	1.3	1.9	–	200	–	200	–	200	–	200	–	200
VWG41.10-1.6-1.6		10	1.6	1.6	–	200	–	200	–	200	–	200	–	200
VWG41.10-1.6-1.9		10	1.6	1.9	–	200	–	200	–	200	–	200	–	200
VWG41.10-1.9-1.9		10	1.9	1.9	–	200	–	200	–	200	–	200	–	200
VWG41.20-0.25-2.5		20	0.25	2.5	–	–	–	200	–	200	–	200	–	200
VWG41.20-0.25-3.45		20	0.25	3.45	–	–	–	200	–	200	–	200	–	200
VWG41.20-0.25-4.25		20	0.25	4.25	–	–	–	200	–	200	–	200	–	200
VWG41.20-0.4-2.5		20	0.4	2.5	–	–	–	200	–	200	–	200	–	200
VWG41.20-0.4-3.45		20	0.4	3.45	–	–	–	200	–	200	–	200	–	200
VWG41.20-0.4-4.25		20	0.4	4.25	–	–	–	200	–	200	–	200	–	200
VWG41.20-0.65-2.5		20	0.65	2.5	–	–	–	200	–	200	–	200	–	200
VWG41.20-0.65-3.45		20	0.65	3.45	–	–	–	200	–	200	–	200	–	200
VWG41.20-0.65-4.25		20	0.65	4.25	–	–	–	200	–	200	–	200	–	200
VWG41.20-1.0-2.5		20	1	2.5	–	–	–	200	–	200	–	200	–	200
VWG41.20-1.0-3.45		20	1	3.45	–	–	–	200	–	200	–	200	–	200
VWG41.20-1.0-4.25		20	1	4.25	–	–	–	200	–	200	–	200	–	200
VWG41.20-1.3-2.5		20	1.3	2.5	–	–	–	200	–	200	–	200	–	200
VWG41.20-1.3-3.45		20	1.3	3.45	–	–	–	200	–	200	–	200	–	200
VWG41.20-1.3-4.25		20	1.3	4.25	–	–	–	200	–	200	–	200	–	200
VWG41.20-1.6-2.5		20	1.6	2.5	–	–	–	200	–	200	–	200	–	200
VWG41.20-1.6-3.45		20	1.6	3.45	–	–	–	200	–	200	–	200	–	200
VWG41.20-1.6-4.25		20	1.6	4.25	–	–	–	200	–	200	–	200	–	200
VWG41.20-2.5-2.5		20	2.5	2.5	–	–	–	200	–	200	–	200	–	200
VWG41.20-2.5-3.45		20	2.5	3.45	–	–	–	200	–	200	–	200	–	200
VWG41.20-2.5-4.25		20	2.5	4.25	–	–	–	200	–	200	–	200	–	200
VWG41.20-3.45-3.45		20	3.45	3.45	–	–	–	200	–	200	–	200	–	200
VWG41.20-4.25-4.25		20	4.25	4.25	–	–	–	200	–	200	–	200	–	200

Fittings for 6-port control ball valves

Type	Description
ALN15.152B	Fittings set made of brass for media temperatures up to 90 °C, consisting of 2x cap nuts 2x inserts with external threading per ISO 228-1 2x flat seals
ALN15.202B	
ALG13.152B	Fittings set made of brass for media temperatures up to 90 °C, consisting of 2x cap nuts with sleeves and insert per ISO 7-1 2x flat seals
ALG15.152B	
ALG15.202B	
ALG15.252B	

Magnetic valves

Typical applications	Valve type	Operating voltage	Positioning signal	Type suffix
– District heating – Boiler plants – Chiller plants – Domestic hot water – Heating groups – Air handling units	**MXF461..**	AC/DC 24 V	0...10 V, 2...10 V, 4...20 mA	P [1]
	M3P..FY..	AC 24 V	0...10 V, 4...20 mA	P [1]
	MVF461H..	AC/DC 24 V	0...10 V, 2...10 V, 0...20 mA, 4...20 mA	–
	MXG461..	AC/DC 24 V	0...10 V, 2...10 V, 4...20 mA	P [1]
	MXG461B..	AC/DC 24 V	0...10 V, 2...10 V, 0...20 mA, 4...20 mA	–
	MXG461S..	AC/DC 24 V	0...10 V, 2...10 V, 4...20 mA	–
	MXG462S..	AC/DC 24 V	0...10 V, 2...10 V, 0...20 mA, 4...20 mA	–

PN 16	1...130 °C	DN	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	**Note**
Data sheet	N4455					
	**MXF461.15-..** [2]	15	0.6 / 1.5 / 3	300	300	To be used as 2-port or mixing valves, not as diverting valves. Selectable valve characteristic: equal-percentage or linear.
	MXF461.20-5.0	20	5	300	300	
	MXF461.25-8.0	25	8	300	300	
	MXF461.32-12	32	12	300	300	
	MXF461.40-20	40	20	300	300	
	MXF461.50-30	50	30	300	300	
	MXF461.65-50	65	50	300	300	
	1...120 °C	DN	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	
	N4454					
	M3P80FY	80	80	300	300	
	M3P100FY	100	130	200	200	
PN 16	1...180 °C	DN	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	
Data sheet	N4361					
	**MVF461H15-..** [2]	15	0.6 / 1.5 / 3	1000	1000	
	MVF461H20-5	20	5	1000	1000	
	MVF461H25-8	25	8	1000	1000	
	MVF461H32-12	32	12	1000	1000	
	MVF461H40-20	40	20	1000	1000	
	MVF461H50-30	50	30	1000	1000	

PN 16	1...130 °C	DN	G [Inch]	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	N4455					
	**MXG461.15-..** [2]	15	G 1B	0.6 / 1.5 / 3	300	300
	MXG461.20-5.0	20	G 1¼B	5	300	300
	MXG461.25-8.0	25	G 1½B	8	300	300
	MXG461.32-12	32	G 2B	12	300	300
	MXG461.40-20	40	G 2¼B	20	300	300
	MXG461.50-30	50	G 2¾B	30	300	300
PN 16	-20...130 °C	DN	G [Inch]	k_{vs} [m³/h]	**Δp_s [kPa]**	**Δp_{max} [kPa]**
Data sheet	N4461					
	**MXG461B15-..** [2]	15	G 1B	0.6 / 1.5 / 3	**1000**	**1000**
	MXG461B20-5	20	G 1¼B	5	**800**	**800**
	MXG461B25-8	25	G 1½B	8	**700**	**700**
	MXG461B32-12	32	G 2B	12	**600**	**600**
	MXG461B40-20	40	G 2¼B	20	**600**	**600**
	MXG461B50-30	50	G 2¾B	30	**600**	**600**

PN 16	1...130 °C		-20...130 °C	DN	**G [Inch]**	**k_{vs} [m³/h]**	**Δp_s [kPa]**	**Δp_{max} [kPa]**	**Note**
Data sheet	N4465		N4466						
	**MXG461S15-1.5**		–	15	G 1B	1.5	300	300	To be used as 2-port or mixing valves, not as diverting valves. Selectable valve characteristic: equal-percentage or linear. [3]
	MXG461S20-5.0		–	20	G 1¼B	5	300	300	
	MXG461S25-8.0		–	25	G 1½B	8	300	300	
	MXG461S32-12		–	32	G 2B	12	300	300	
	–		**MXG462S50-30**	50	G 2¾B	30	600	600	

Slipper valves

Typical applications	Actuators	Data sheet		10 Nm	10 Nm
– Boiler plants – Heating groups	**SAL..**	N4502			
	Operating voltage	**Positioning signal**	**Positioning time [s]**		
	AC 230 V	3-position	120	**SAL31.00T10**	**SAL31.00T10**
		3-position	30	**SAL31.03T10**	**SAL31.03T10**
	AC/DC 24 V	3-position	120	**SAL81.00T10**	**SAL81.00T10**
		3-position	30	**SAL81.03T10**	**SAL81.03T10**
		0...10 V, 4...20 mA	120	**SAL61.00T10**	**SAL61.00T10**
		0...10 V, 4...20 mA	30	**SAL61.03T10**	**SAL61.03T10**
	Mounting set			**ASK32N**	**ASK31N**

PN 6	1...120 °C	DN	k_{vs} [m³/h]	Δp_{max} [kPa]	Δp_{max} [kPa]
Data sheet	N4241				
	**VBF21.40**	40	25	30	–
	VBF21.50	50	40	30	–
	VBF21.65	65	63	–	30
	VBF21.80	80	100	–	30
	VBF21.100	100	160	–	30
	VBF21.125	125	550	–	30
	VBF21.150	150	820	–	30

[1] P = media containing mineral oil [2] .. = insert k_{vs} value [3] Parts that are in contact with medium in stainless steel

MXG461B.. valves contain only materials in contact with drinking water that comply with the UBA Positive List dated April 23, 2013, Categories B+C

Butterfly valves

Typical applications	Actuators	Data sheet		Rotation angle 90°	
				10 Nm	40 Nm
– Boiler plants – Chiller plants – Heating groups	SAL..	N4502			
	Operating voltage	Positioning signal	Positioning time [s]		
	AC 230 V	3-position	120	SAL31.00T10	SAL31.00T40
		3-position	125	–	–
		3-position	30	SAL31.03T10	–
	AC/DC 24 V	3-position	120	SAL81.00T10	SAL81.00T40
		3-position	30	SAL81.03T10	–
		0...10 V, 4...20 mA	120	SAL61.00T10	SAL61.00T40
		0...10 V, 4...20 mA	30	SAL61.03T10	–
	Mounting set			ASK33N	ASK33N

PN 6/10/16	-10...120 °C	DN	k_{vs} [m³/h]	Δp_s [kPa]	Δp_s [kPa]
Data sheet	N4131				
	VKF41.40	40	50	500	–
	VKF41.50	50	80	500	–
	VKF41.65	65	200	500	–
	VKF41.80	80	400	500	–
	VKF41.100	100	760	500	–
	VKF41.125	125	1000	300	–
	VKF41.150	150	2100	250	400
	VKF41.200	200	4000	125	300

Typical applications	Actuators	Data sheet		Rotation angle 90°						
				20 Nm	40 Nm	40 Nm		100 Nm	400 Nm	1200 Nm
– Boiler plants – Chiller plants – Cooling towers – Domestic hot water – Heating groups	SAL.. SQL36..	N4502 N4505								
	Operating voltage	Positioning signal	Positioning time [s]							
	AC 230 V	3-position	6 [1]	–	–	–	–	SQL36E65	–	–
		3-position	12 [1]	–	–	–	–	–	SQL36E110	–
		3-position	24 [1]	–	–	–	–	–	–	SQL36E160
		3-position	25	–	–	SQL36E50F04	SQL36E50F05	–	–	–
		3-position	120	SAL31.00T20	SAL31.00T40	–	–	–	–	–
	AC/DC 24 V	3-position	120	SAL81.00T20	SAL81.00T40	–	–	–	–	–
		0...10 V, 4...20 mA	120	SAL61.00T20	SAL61.00T40	–	–	–	–	–

PN 16	-10...120 °C	DN	k_{vs} [m³/h]	Δp_s [kPa]	Δp_s [kPa]	Δp_s [kPa]	Δp_s [kPa]	Δp_s [kPa]	Δp_s [kPa]	Δp_s [kPa]
Data sheet	N4136									
	VKF46.40	40	50	1600	–	1600	–	–	–	–
	VKF46.50	50	85	1600	–	1600	–	–	–	–
	VKF46.65	65	215	1600	–	1600	–	–	–	–
	VKF46.80	80	420	–	1600	–	1600	–	–	–
	VKF46.100	100	800	–	1200	–	1600	–	–	–
	VKF46.125	125	1010	–	800	–	1000	–	–	–
	VKF46.150	150	2100	–	–	–	–	1600	–	–
	VKF46.200	200	4000	–	–	–	–	1000	–	–
	VKF46.250	250	6400	–	–	–	–	–	1000	–
	VKF46.300	300	8500	–	–	–	–	–	1000	–
	VKF46.350	350	11500	–	–	–	–	–	600	–
	VKF46.400	400	14500	–	–	–	–	–	300	–
	VKF46.450	450	20500	–	–	–	–	–	–	300
	VKF46.500	500	21000	–	–	–	–	–	–	300
	VKF46.600	600	29300	–	–	–	–	–	–	300

1) With auxiliary module SEZ31.1 variable positioning time: SQL36E65: 30...180 s, SQL36E110: 60...360 s, SQL36E160: 120...720 s

Recommended maximum flow velocity:

VKF41..: < 4 m/s for water, see data sheet for details

VKF46..: 4.5 m/s for water, 60 m/s for gas

Changeover and open / close ball valves

Typical applications	Actuators	Data sheet
– Boiler plants	**GQD..9A**	N4659
– Chiller plants	**GSD..9A**	N4655
– Domestic hot water	**GMA..9E**	N4658
– Heating groups	**GLB..9E**	A6V10636203

Operating voltage	Positioning signal	Positioning time [s]			Spring return function [s]	2 Nm	5 Nm	7 Nm	10 Nm
		GQD/GSD	GMA	G..B					
AC 230 V	2-position	30	90	–	15	**GQD321.9A**	–	**GMA321.9E**	–
	2-position	30	–	–	–	**GSD341.9A**	–	–	–
AC 100...240 V	2/3-position	–	–	150	–	–	**GDB341.9E**	–	**GLB341.9E**
AC/DC 24 V	2-position	30	90	–	15	**GQD121.9A**	–	**GMA121.9E**	–
	2-position	30	–	–	–	**GSD141.9A**	–	–	–
	2/3-position	–	–	150	–	–	–	–	**GLB141.9E**
	KNX S-/ LTE- Mode, KNX PL-Link	–	–	150	–	–	**GDB111.9E/KN**	–	**GLB111.9E/KN**
	Modbus	–	–	150	–	–	–	–	**GLB111.9E/MO**

PN 40	-10...120 °C	DN	G [Inch]	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	N4213											
	**VAG60.15-9**	15	G 1B	9	1400	350	1400	350	1400	350	1400	350
	VAG60.20-17	20	G 1 ¼B	17	1400	350	1400	350	1400	350	1400	350
	VAG60.25-22	25	G 1 ½B	22	1400	350	1400	350	1400	350	1400	350
	VAG60.32-35	32	G 2B	35	–	–	–	–	1000	350	1000	350
	VAG60.40-68	40	G 2 ¼B	68	–	–	–	–	800	350	800	350
	VAG60.50-96	50	G 2 ¾B	96	–	–	–	–	600	350	600	350

PN 40	-10...120 °C	DN	G [Inch]	k_{vs} [m³/h]	Δp_{max} [kPa]	Δp_{max} [kPa]	Δp_{max} [kPa]	Δp_{max} [kPa]
Data sheet	N4213							
	**VBG60.15-8T**	15	G 1B	8	350	350	350	350
	VBG60.20-13T	20	G 1 ¼B	13	350	350	350	350
	VBG60.25-13T	25	G 1 ½B	13	350	350	350	350
	VBG60.32-25T	32	G 2B	25	–	–	350	350
	VBG60.40-49T	40	G 2 ¼B	49	–	–	350	350
	VBG60.50-73T	50	G 2 ¾B	73	–	–	350	350

PN 40	-10...120 °C	DN	Rp [Inch]	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	N4213											
	**VAI60.15-15**	15	Rp ½	15	1400	350	1400	350	1400	350	1400	350
	VAI60.20-22	20	Rp ¾	22	1400	350	1400	350	1400	350	1400	350
	VAI60.25-22	25	Rp 1	22	1400	350	1400	350	1400	350	1400	350
	VAI60.32-35	32	Rp 1¼	35	–	–	–	–	1000	350	1000	350
	VAI60.40-68	40	Rp 1½	68	–	–	–	–	800	350	800	350
	VAI60.50-96	50	Rp 2	96	–	–	–	–	600	350	600	350

PN 40	-10...120 °C	DN	Rp [Inch]	k_{vs} [m³/h]	Δp_{max} [kPa]	Δp_{max} [kPa]	Δp_{max} [kPa]	Δp_{max} [kPa]
Data sheet	N4213							
	**VBI60.15-12T**	15	Rp ½	12	350	350	350	350
	VBI60.20-16T	20	Rp ¾	16	350	350	350	350
	VBI60.25-16T	25	Rp 1	16	350	350	350	350
	VBI60.32-25T	32	Rp 1¼	25	–	–	350	350
	VBI60.40-49T	40	Rp 1½	49	–	–	350	350
	VBI60.50-73T	50	Rp 2	73	–	–	350	350

PN 40	-10...120 °C	DN	Rp [Inch]	k_{vs} [m³/h]	Δp_{max} [kPa]	Δp_{max} [kPa]	Δp_{max} [kPa]	Δp_{max} [kPa]
Data sheet	N4213							
	**VBI60.15-5L**	15	Rp ½	5	350	350	350	350
	VBI60.20-9L	20	Rp ¾	9	350	350	350	350
	VBI60.25-9L	25	Rp 1	9	350	350	350	350
	VBI60.32-13L	32	Rp 1¼	13	–	–	350	350
	VBI60.40-25L	40	Rp 1½	25	–	–	350	350
	VBI60.50-37L	50	Rp 2	37	–	–	350	350

Refrigerant valves

Typical applications	Valve	Operating voltage	Positioning signal	Auxiliary functions
– Chiller plants	**M2FP03GX**	AC 24 V	0...10 V, 4...20 mA, 0...20 Phs	–
	MVL661..[1)]	AC/DC 24 V	0...10 V, 2...10 V, 0...20 mA, 4...20 mA	Minimum stroke setting
	MVS661..N[1)]	AC/DC 24 V	0...10 V, 2...10 V, 0...20 mA, 4...20 mA	Minimum stroke setting
	M3FB..LX..	AC 24 V	0...10 V, 4...20 mA, 0...20 Phs	–
	M3FK..LX..	AC 24 V	0...10 V, 4...20 mA, 0...20 Phs	–

PN 32	-40...100 °C			k_{vs} [m³/h]	Δp_{max} [kPa]
Data sheet	N4731				
	**M2FP03GX**		Pilot valve	0.3	1800

PS 45	-40...120 °C	DN	Connection	Inner Ø [Inch]	k_{vs} [m³/h]	k_{vs} reduced [m³/h]	Δp_{max} [kPa]
Data sheet	N4714						
	**MVL661.15-0.4**	15	Sleeve	⅝	0.4	0.25	2500
	MVL661.15-1.0	15	Muffen	⅝	1	0.63	2500
	MVL661.20-2.5	20	Sleeve	⅞	2.5	1.6	2500
	MVL661.25-6.3	25	Sleeve	1⅛	6.3	4	2500
	MVL661.32-10	32	Sleeve	1⅜	10	6.3	1600
	MVL661.32-12	32	Sleeve	1⅜	12	7.6	200

PN 63	-40...120 °C	DN	Connection	Inner Ø [Inch]	Outer Ø [mm]	k_{vs} [m³/h]	k_{vs} reduced [m³/h]	Δp_{max} [kPa]
Data sheet	N4717							
	**MVS661.25-016N**	25	Weldable, solderable	22.4	33.7	0.16	0.1	2500
	MVS661.25-0.4N	25	Weldable, solderable	22.4	33.7	0.4	0.25	2500
	MVS661.25-1.0N	25	Weldable, solderable	22.4	33.7	1	0.63	2500
	MVS661.25-2.5N	25	Weldable, solderable	22.4	33.7	2.5	1.6	2500
	MVS661.25-6.3N	25	Weldable, solderable	22.4	33.7	6.3	4	2500

PN 32	-40...120 °C	DN	Connection	Inner Ø [Inch]	k_{vs} [m³/h]	Liquid Δp_{max} [kPa]	Gas Δp_{max} [kPa]
Data sheet	N4722						
	**M3FK15LX06**	15	Sleeve	⅝	0.6	200	800
	M3FK15LX15	15	Sleeve	⅝	1.5	200	800
	M3FK15LX	15	Sleeve	⅝	3	200	800
	M3FK20LX	20	Sleeve	⅞	5	200	800
	M3FK25LX	25	Sleeve	1⅛	8	200	800
	M3FK32LX	32	Sleeve	1⅜	12	200	800
	M3FK40LX	40	Sleeve	1⅝	20	200	800
	M3FK50LX	50	Sleeve	2⅛	30	200	800

PS 43	-40...120 °C	DN	Connection	Inner Ø [Inch]	k_{vs} [m³/h]	Δp_{max} [kPa]
Data sheet	N4721					
	**M3FB15LX06/A**	15	Sleeve	⅝	0.6	2200
	M3FB15LX15/A	15	Sleeve	⅝	1.5	2200
	M3FB15LX/A	15	Sleeve	⅝	3	2200
	M3FB20LX/A	20	Sleeve	⅞	5	1800
	M3FB25LX/A	25	Sleeve	1⅛	8	1200
	M3FB32LX	32	Sleeve	1⅜	12	800

[1)] Also available as ATEX Zone 2

Symbols

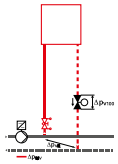
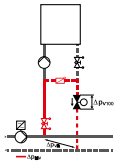
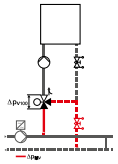
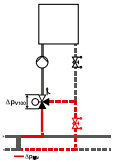
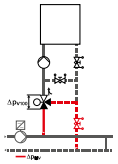
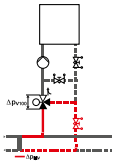
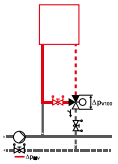
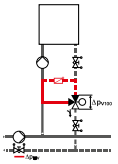
	3-port valve, control path with equal-percentage valve characteristic, bypass with linear valve characteristic.
	3-port valve, control path with equal-percentage valve characteristic, bypass with linear valve characteristic with 70% of the k_{VS} value. This compensates for the flow resistance of the heat exchanger, so that the total volumetric flow $\dot{V}_{100}$ remains as constant as possible.
	2-port valve, control path with equal-percentage valve characteristic.
	2-port valve or 6-port control ball valve in the respective control path with linear valve characteristic.
	3-port, control path and bypass with linear valve characteristic. Bypass with 70% of the k_{vs} value. This compensates for the flow resistance of the heat exchanger, so that the total flow amount $\dot{V}_{100}$ remains as constant as possible.
	3-port valve, control path and bypass with linear valve characteristic.
	3-port valve, control path and bypass with equal-percentage valve characteristic.

Definitions

Abbr.	Term	Unit	Definition
Δp	Differential pressure	kPa	Pressure differential between plant sections.
Δp_{max}	Maximum differential pressure	kPa	Maximum permissible differential pressure across the valve's control path (when mixing), valid for the entire actuating range of the motorized valve.
Δp_{maxV}	Maximum differential pressure	kPa	Maximum permissible differential pressure across the valve's control path (when distributing), valid for the entire actuating range of the motorized valve.
Δp_{min}	Minimum differential pressure	kPa	Minimum differential pressure required, so that the differential pressure regulator works reliably with combi valves. Δp_{min} depends on presetting position, see data sheet for details.
Δp_{V0}		kPa	Maximum differential pressure across the valve's closed control path.
Δp_{V100}	Differential pressure at nominal flow rate	kPa	Differential pressure across the fully open valve and the valve's control path by a volumetric flow $\dot{V}_{100}$.
Δp_s	Closing pressure	kPa	For 2-port valves, maximum permissible differential pressure at which the motorized valve will close securely against the pressure (close off pressure). Only valid for 2-port valves.
Δp_{MV}		kPa	Differential pressure across the variable flow path. Often Δp_{MV} is not known, in which case typical values can be used.
Δp_{VR}		kPa	Differential pressure between flow and return.
ΔT	Temperature spread	K	Temperature differential between flow and return.
DN	Nominal size		Characteristic for matching parts of the piping system.
H_0	Shutoff head	m	The head generated by a pump at closed value, at a given speed and a given pump medium.
H_{100}	Valve fully open		Stroke of fully open valve.
kPa	Druckeinheit	kPa	100 kPa = 1 bar = 10 mWS.
mWC	Meter water column	m	
k_V	Nominal flow	m³/h	Amount of cold water (5...30 °C) passing through the valve at the respective stroke and at a differential pressure of 100 kPa (1 bar).
k_{VS}	Nominal flow rate	m³/h	Nominal flow rate of cold water (5...30 °C) through the fully open valve (H_{100}) at a differential pressure of 100 kPa (1 bar).
	Spring return function		Shutoff in the event of a power failure.
PN	PN class		Characteristic relating to the combination of mechanical and dimensional properties of a component in the piping system.
PS	PS class		Maximum allowable pressure.
P_V	Valve authority		Ratio of differential pressure across fully open valve (H_{100}) and differential pressure across valve and variable flow path. To ensure control, a minimum valve authority of 0.25 is required. PV ≥ 0.5 is recommended for good controllability.
Q_{100}	Rated capacity	kW	Plant's design capacity.
$\dot{V}_{100}$	Volumetric flow	m³/h	Volumetric flow with valve fully open (H_{100}).
$\dot{V}_{min}$	Minimum volumetric flow	m³/h	Smallest presettable volumetric flow through the fully open combi valve (H_{100}).
c	Specific heat capacity	kJ/kgK	
ρ	Specific density	kg/m³	

Valve sizing and actuator selection

Basic hydronic circuit

1	**Determine the type of hydronic circuit**	Throttling circuit	Injection circuit with 2-port valve	Mixing circuit		Mixing circuit with fixed premixing		Diverting circuit	Injection circuit with 3-port valve
—	For valve sizing relevant variable flow path			Primary pump ✓ 	Primary pump ✕ 	Primary pump ✓ 	Primary pump ✕ 		

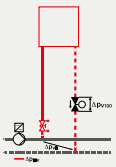
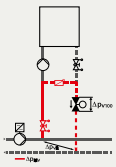
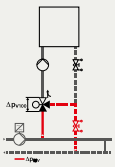
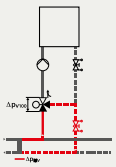
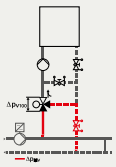
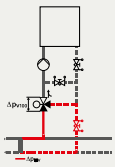
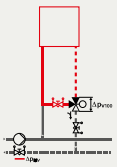
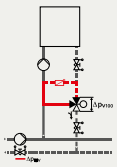
HVAC plants and consumers

Heating								
Surface/floor heating	–	■	–	–	■	■	–	outdated
Heating plant (primary)	–	■	■	■	■	■	outdated	outdated
Zone control, heating	–	■	–	–	–	–	–	outdated
Heating groups	–	■	■	■	■	■	–	–
Generation of heat energy	–	–	–	■	–	■	–	–
Heat exchanger water-water	■	uncommon	uncommon	–	–	–	uncommon	uncommon
Ventilation and air conditioning plants								
Air handling unit	■	■	■	■	–	–	outdated	outdated
Fan coil unit	■	–	–	–	–	–	outdated	outdated
Cooling coil	dehumidifying	■	–	–	–	–	uncommon	uncommon
Reheating coil	■	■	uncommon	uncommon	uncommon	uncommon	outdated	outdated
Preheating coil	–	■	uncommon	uncommon	uncommon	uncommon	–	outdated
VAV	■	–	–	–	–	–	outdated	outdated
Zone control	■	–	–	–	–	–	outdated	outdated
Chiller plants								
Surface/floor cooling	–	■	–	–	–	–	–	outdated
Generation of cooling energy	–	–	–	■	–	■	–	–
Cooling towers	■	–	–	–	–	–	outdated	uncommon
Zone control, cooling	–	■	–	–	–	–	–	outdated
District heating and cooling								
District heating, primary	■	uncommon	–	uncommon	–	uncommon	–	–
District heating, secondary	■	■	–	uncommon	–	uncommon	–	–
District cooling, primary	■	uncommon	–	uncommon	–	uncommon	–	–
District cooling, secondary	■	■	–	uncommon	–	uncommon	–	–
Hot water								
Hot water directly	–	■	–	■	–	–	–	–

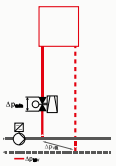
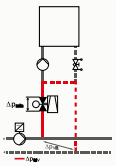
Header

Differential pressure header	pressurized	low-pressure	pressureless	low-pressure	pressureless	pressurized
Volumetric flow	variable	variable				constant

Valve sizing and selection: k_{vs} valves and actuators

1	**Determine the type of hydronic circuit**	Throttling circuit	Injection circuit with 2-port valve	Mixing circuit Primary pump ✓	Mixing circuit Primary pump ✗	Mixing circuit with fixed premixing Primary pump ✓	Mixing circuit with fixed premixing Primary pump ✗	Diverting circuit	Injection circuit with 3-port valve
									
Determine volumetric flow $\dot{V}$									
2	**Δp_{VR} or Δp_{MV}**	Δp_{VR}				Δp_{MV}			
	typical range	10...200 kPa	10...200 kPa	2...5 kPa	5...15 kPa	2...5 kPa	5...15 kPa	10...50 kPa	2...5 kPa
	typical value	Use effective Δp_{VR} value		3 kPa	8 kPa	3 kPa	8 kPa	eff. value Δp_{MV}	3 kPa
3	**Determine Δp_{V100}**	$\Delta p_{V100} \geq \frac{\Delta p_{VR}}{2}$ $(P_V \geq 0.5)$		$\Delta p_{V100} \geq \Delta p_{MV}$ $(P_V \geq 0.5)$					
4	**Calculate $\dot{V}_{100}$**	Water without anti-freeze $\dot{V}_{100} = \frac{\dot{Q}_{100}}{1.163 \cdot \Delta T}$				Water with anti-freeze $\dot{V}_{100} = \frac{\dot{Q}_{100} \cdot 3600}{c \cdot \rho \cdot \Delta T}$			
5	**Determine k_{vs} value**	$k_V = \frac{\dot{V}_{100}}{\sqrt{\frac{\Delta p_{V100}}{100\ kPa}}}$ => $k_{VS} \geq 0.85 \cdot k_V$ value							
6	**Check resulting Δp_{V100}**	$\Delta p_{V100} = 100 \cdot \left(\frac{\dot{V}_{100}}{k_{VS}}\right)^2$							
Selection of valve and actuator									
7	**Select suitable valve series**	1. Type of valve (2-port, 3-port, 3-port with bypass) 2. Connections (flanged, threaded, soldered)				3. PN class 4. Nominal size DN		5. Max. / min. medium temperature 6. Medium	
8	**Check valve authority P_v**	$P_V = \frac{\Delta p_{V100}}{\Delta p_{VR}} \geq 0.25...0.8$		$P_V = \frac{\Delta p_{V100}}{\Delta p_{V100} + \Delta p_{MV}} \geq 0.25...0.8$					
9	**Select actuator**	1. Operating voltage 2. Positioning signal 3. Positioning time 4. Spring return function 5. Auxiliary functions							
10	**Check working range**	1. Differential pressure $\Delta p_{max} > \Delta p_{V0}$ 2. Closing pressure $\Delta p_s > H_0$							
11	**Selection**	Valve and suitable actuator							

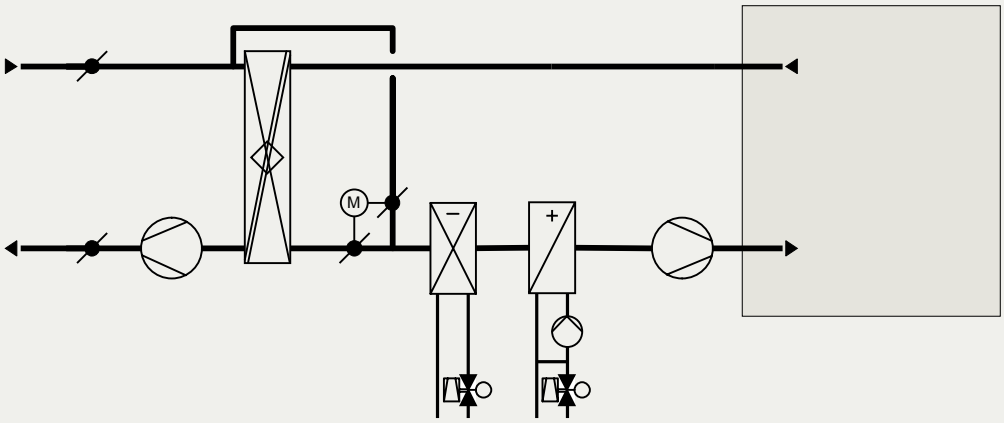
Valve sizing and selection: Intelligent Valves, PICVs and actuators

1	**Determine the type of hydronic circuit**	Throttle circuit or injection system with 2-port valve			
					
Determine volumetric flow $\dot{V}$					
2	**Determine $\dot{Q}_{100}$**	$\dot{Q}_{100}$			
3	**Determine ΔT**	ΔT			
4	**Calculate $\dot{V}$**	Water without anti-freeze $\dot{V}_{100} = \frac{\dot{Q}_{100}}{1.163 \cdot \Delta T}$		Water with anti-freeze $\dot{V}_{100} = \frac{\dot{Q}_{100} \cdot 3600}{c \cdot \rho \cdot \Delta T}$	
Select valve and actuator					
5	**Select suitable valve**	1. Type of valve (with / without P/T plugs) 4. Connection (flanged, threaded)	2. PN class 5. Nominal size DN	3. Max. / min. medium temperature 6. Medium	
6	**Determine presetting**	Determine presetting using the volumetric flow / dial table in data sheet of the respective PICV			
7	**Select actuator for PICV**	1. Operating voltage 2. Positioning signal 3. Positioning time 4. Auxiliary functions			
8	**Check working range**	1. $\Delta p < \Delta p_{max}$ – maximum permissible differential pressure across the valve's control path, valid for the entire actuating range of the motorized valve 2. $\Delta p > \Delta p_{min}$ – minimum differential pressure required across the valve's control path, so that the differential pressure regulator works reliably			

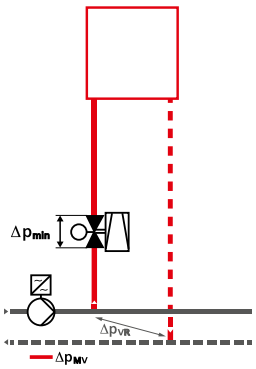
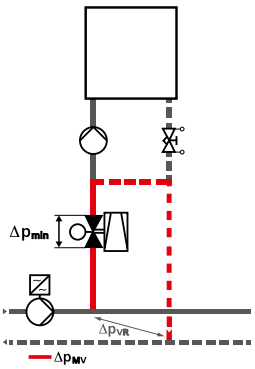
Or just use the Acvatix slide ruler, the online tool for simple valve sizing, to find the right valve with actuator.

Or just install the Combi Valve Sizer on your smartphone to find the right PICV with actuator.

Air handling unit with cooling coil (cooling/de-humidification) and reheating coil, with PICVs

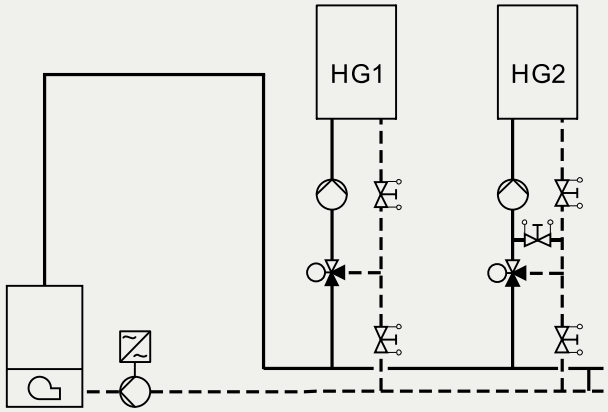


Plant data	Cooling coil	Heating coil
Cooling/heating power $\dot{Q}_{100}$	75 kW	65 kW
Supply temperature producer $\theta_{Producer}$	6 °C	55 °C
Temperatures Supply/Return θ_{Supply} / θ_{Return}	6/12 °C	50/35 °C
Temperature difference	6 K	20 K
Medium	Water	Water
Differential pressure Δp_{MV} without balancing valve	57 kPa	12 kPa
Shutoff head pump H_0 (resp. Δp_{V0})	18 mWC (180 kPa)	18 mWC (180 kPa)
Positioning signal	0...10 V	0...10 V

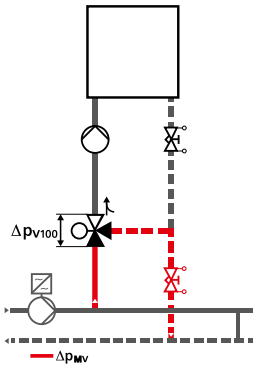
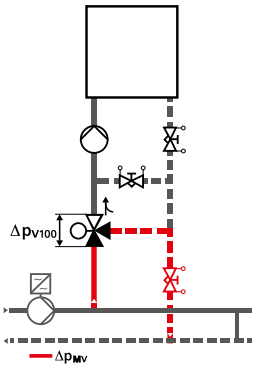
	Cooling coil	Reheating coil
1 Determine Volumetric flow $\dot{V}_{100}$		
$\dot{V}_{100} = \frac{\dot{Q}_{100}}{1.163 \cdot \Delta T}$ decisive temperature difference Constant 1.163: with density ρ = 1000 kg/m³, 3600 s/h and specific heat capacity c = 4.187 kJ/kg · K	$\dot{V}_{100} = \frac{75\ kW}{1.163 \cdot 6\ K} = 10.75\ m^3/h$ $\theta_{Return\ cooling\ coil} - \theta_{Producer} = (12 - 6)\ °C = 6\ K$	$\dot{V}_{100} = \frac{65\ kW}{1.163 \cdot 20\ K} = 2.79\ m^3/h$ $\theta_{Producer} - \theta_{Return\ heating\ coil} = (55 - 35)\ °C = 20\ K$
Hydronic circuit Δp_{MV} Differential pressure across variable flow path	Throttling circuit 	Injection circuit with 2-port valve 
Distribution setup	Pressurized with variable volumetric flow (primary pump controlled)	

	Cooling coil	Reheating coil
2 Determine minimally required differential pressure Δp_{min} (from data sheet)		
Cooling coil VPF43.50F16	**VPF43.50F16** — **16 m³/h nominal** **V̇ [m³/h]** | **Dial** | **Δp_{min} [kPa]** Min. 0.2 0.4 | 0.6 0.8 1 1.2 1.4 1.6 1.8 2 2.2 2.4 2.6 2.8 3 3.2 3.4 3.6 3.8 **4** 6.5 6.5 6.5 6.8 7.1 7.4 7.7 8.0 8.8 9.6 10.4 11.2 12.0 13.5 15.2 16.8 18.5 **20** 2.5 3.2 3.8 4.5 5.3 6 6.8 7.5 8.3 9 9.8 10.5 11.3 12 12.8 13.5 14.3 **15**	
Reheating coil VPP46.32F4Q	**VPP46.32F4, VPP46.32F4Q, VPI46.32F4, VPI46.32F4Q** — **4000 l/h nominal** **V̇ [l/h]** | **Dial** | **Δp_{min} [kPa]** Min. 0.2 0.4 0.5 | 0.6 0.8 1 1.2 1.4 1.6 1.8 2 2.2 2.4 2.6 2.8 3 3.2 3.4 3.6 3.8 Max. 17.9 18 18.1 18.2 18.3 18.5 18.7 18.9 19.2 19.6 20.1 20.7 21.4 22.3 23.4 24.6 26 28 550 800 910 1110 1320 1520 1720 1930 2130 2330 2530 2740 2940 3140 3350 3550 3750 4001	
Δp_{min}	Δp_{min} = 11.5 kPa	Δp_{min} = 21 kPa
Presetting	Dial = 2.85	Dial = 2.85
Total resistance Δp_{VR} for primary pump	$\Delta p_{VR} = \Delta p_{MV} + \Delta p_{min}$ = 57 kPa + 11.5 kPa Δp_{VR} = 68.5 kPa (6.8 mWC)	$\Delta p_{VR} = \Delta p_{MV} + \Delta p_{min}$ = 12 kPa + 21 kPa Δp_{VR} = 33 kPa (3.3 mWC)
3 Select suitable valve type		
Type of valve	PICV (with linear characteristic)	PICV (with linear characteristic)
Connection type	Flange	External thread
Nominal pressure level PN	PN 16	PN 16
Selected valve	VPF43.50F16 (with measuring points)/ piping size DN 50	VPP46.32F4Q (with measuring points)/ piping size DN 32
4 Select valve actuator		
Actuator type	SAX.. with 20 mm stroke	SSA.. with 5 mm stroke
Operating voltage	AC 24 V	AC 24 V
Positioning signal	0...10 V	0...10 V
Positioning time	30 s	34 s
Spring return function	No	No
Additional functions	None	None
Selected actuator	SAX61P03, with selectable characteristic ➞ equal percentage *fits well to cooling coil transfer characteristic*	SSA61EP ➞ with equal percentage characteristic *fits well to reheating coil transfer characteristic*
Selection		
PICV	VPF43.50F16 (with measuring points)	VPP46.32F4Q (with measuring points)
Valve actuator	SAX61P03	SSA61EP

Heating plant with low-pressure distribution, with k_{VS}-valves (3-port)



Plant data	Heating group 1	Heating group 2
Heating group power $\dot{Q}_{100}$	90 kW	60 kW
Supply temperature producer $\theta_{Producer}$	55 °C	55 °C
Temperatures Supply/Return θ_{Supply} / θ_{Return}	50/40 °C	35/28 °C
Temperature spread	see below	see below
Medium	Water	Water
Differential pressure Δp_{MV}	see below	see below
Shutoff head pump H_0 (resp. Δp_{V0})	4.5 mWC (45 kPa)	4.5 mWC (45 kPa)
Positioning signal	3-position	3-position

	Heating group 1	Heating group 2
1 Determine Volumetric flow $\dot{V}_{100}$		
$\dot{V}_{100} = \frac{\dot{Q}_{100}}{1.163 \cdot \Delta T}$ decisive temperature difference Constant 1,163: with density ρ = 1000 kg/m³, 3600 s/h and specific heat capacity c = 4.187 kJ/kg · K	$\dot{V}_{100} = \frac{90\ kW}{1.163 \cdot 15\ K} = 5.16\ m^3/h$ $\theta_{Producer} - \theta_{Return\ HG\ 1} = (55 - 40)\ °C = 15\ K$	$\dot{V}_{100} = \frac{60\ kW}{1.163 \cdot 27\ K} = 1.91\ m^3/h$ $\theta_{Producer} - \theta_{Return\ HG\ 2} = (55 - 28)\ °C = 27\ K$
2 Determine Differential pressure Δp_{v100}		
Hydronic circuit	Mixing circuit with pump	Mixing circuit with fixed pre-mixing with pump
		
Δp_{MV} Differential pressure across variable flow path		
Distribution setup	low pressure	
Δp_{MV} typical range	2...5 kPa	
typical value	3 kPa	
Δp_{V100}	$\Delta p_{V100} \geq \Delta p_{MV}$ (resp. $P_V \geq 0.5$)	
Desired differential pressure	$\Delta p_{V100} \geq 3$ kPa	

	Heating group 1	Heating group 2
3 Determine desired flow k_v		
$k_V = \frac{\dot{V}_{100}}{\sqrt{\frac{\Delta p_{V100}}{100\ kPa}}}$	$k_V = \frac{5.16\ m^3/h}{\sqrt{\frac{3\ kPa}{100\ kPa}}} = 29.8\ m^3/h$	$k_V = \frac{1.91\ m^3/h}{\sqrt{\frac{3\ kPa}{100\ kPa}}} = 11.0\ m^3/h$
4 Select valve nominal flow rate kVS and determine resulting differential pressure $\Delta p_{V100\ res}$		
$k_{VS} \geq 0.85 \cdot k_V$-value	$k_{VS} \geq 0.85 \cdot 29.8\ m^3/h = 25.3\ m^3/h$ selected: $k_{VS} = 25\ m^3/h$	$k_{VS} \geq 0.85 \cdot 11.0\ m^3/h = 9.4\ m^3/h$ selected: $k_{VS} = 10\ m^3/h$
resulting $\Delta p_{V100\ res}$ $\Delta p_{V100\ res} = 100\ kPa \cdot \left(\frac{\dot{V}_{100}}{k_{VS}}\right)^2$	$\Delta p_{V100\ res} = 100\ kPa \cdot \left(\frac{5.16\ m^3/h}{25\ m^3/h}\right)^2$ $\Delta p_{V100\ res} = 4.3\ kPa$	$\Delta p_{V100\ res} = 100\ kPa \cdot \left(\frac{1.91\ m^3/h}{10\ m^3/h}\right)^2$ $\Delta p_{V100\ res} = 3.6\ kPa$
5 Check valve authority P_v (control stability)		
$P_V = \frac{\Delta p_{V100\ res}}{\Delta p_{V100\ res} + \Delta p_{MV}}$ and $0.3 < P_V < 0.6$	$P_V = \frac{4.3\ kPa}{4.3\ kPa + 3\ kPa}$ $P_V = 0.59$	$P_V = \frac{3.6\ kPa}{3.6\ kPa + 3\ kPa}$ $P_V = 0.55$
6 Select suitable valve type		
Type of valve	3-port valve	3-port valve
Connection type	External thread	External thread
Nominal pressure level PN	PN 16	PN 16
Possible valve type(s)	VXG44.., VXG41..	VXG44.., VXG41..
Selected valve	VXG44.40-25 mit $k_{VS} = 25\ m^3/h$ piping size DN 40 with linear characteristic	VXG44.25-10 mit $k_{VS} = 10\ m^3/h$ piping size DN 25 with linear characteristic
7 Check valve working range		
Medium	VXG44 suitable for water	VXG44 suitable for water
Medium temperature	40 °C > 1 °C min. medium temperature	28 °C > 1 °C min. medium temperature
	50 °C < 120 °C max. medium temperature	35 °C < 120 °C max. medium temperature
8 Select actuator		
Actuator type	SAS.. with 5.5 mm stroke	
Operating voltage	AC 230 V	
Positioning signal	3-point (open – 0 – close)	
Positioning time	30...120 s	
Spring return function	No	
Additional functions	Auxiliary switches, potentiometer, feedback signal available or included	
Selected actuator	SAS31.00	SAS31.00
9 Check actuator working range		
Differential pressure $\Delta p_{max} \geq \Delta p_{V0}$ (H_0)	$\Delta p_{max} = 125\ kPa \geq 45\ kPa$	$\Delta p_{max} = 400\ kPa \geq 45\ kPa$
Closing pressure $\Delta p_S \geq \Delta p_{V0}$ (H_0)	Not with 3-port valves	
Selected actuator	SAS31.00 positioning time 120 s, no spring return function, no additional functions, AC 230 V	
Selection		
Valve	VXG44.40-25 with $k_{VS} = 25\ m^3/h$	VXG44.25-10 with $k_{VS} = 10\ m^3/h$
Actuator	SAS31.00	SAS31.00

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