More warranty for you!

5

VALVES AND ACTUATORS

Do it right

Fast and easy planning, installation and commissioning
siemens.com/valves

SIEMENS

The right solution
or every hydronic project

New: 5-year warranty on valves and actuators, damper actuators, and sensors.

With Siemens 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 Siemens valves and actuators, 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.

Siemens 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.

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, operation and commissioning

Siemens hydronics.
Efficient all down the line

Product selection and engineering made easy
Tools from Siemens – such as the HIT Portal, the Siemens 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
Siemens valves and actuators 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
Siemens valves and actuators 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. Siemens 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/PICV app
App for easily selecting and sizing Siemens PICVs and actuators. The app also calculates the maximum volumetric flow and presetting, checks the commissioning settings and provides access to all data sheets.

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.

SIEMENS

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 control 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	Fan coil units	Heating groups, air handling units	District heating
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, 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	Zone control	–	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

Experience the comfort of the right amount of energy in the right place at the right time. Enjoy the benefits of a perfectly balanced hydraulic system with our new 6-port PICVs.

Highlights:

- A constantly balanced system thanks to a fast reaction to fluctuations in pressure
- High control accuracy and perfect comfort thanks to a large control angle of 40° for both heating and cooling and the new actuator with high resolution
- Reduce pump's energy consumption thanks to high flow rates with minimal differential pressure
- No mixing of cooling and heating water thanks to a true close-off
- Protection against overpressures with an internal pressure equalization function
- Also available with Modbus actuator
- Fool-proof valve selection without complex pressure drop and valve authority calculations
- Only one data point to cost optimize your solution
- Error-free, time-saving installation without tools using the Siemens bayonet mount
- Protect your investment with a 5-year warranty

In combination with RDG thermostats from Siemens you get even more benefits:

- Time and cost savings through faster planning, installation and commissioning
- Drastic reduction of commissioning time on site

Enter the desired flow rates with the Siemens PCT-Go app on the RDG thermostat and send it via NFC technology to the PICV. Thermostat and PICV actuator automatically adjust the position.

Thanks to NFC, the thermostat can be easily programmed in the package without the need for a power supply.

More on hydronic balancing

Benefits of dynamic hydronic balancing with PICVs

- 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

■ recommended
□ also possible

											Recommended media												Generation				Distribution			Consumption / Use					
		2-port valve	3-port valve	6-port valve	PN class	Type of connection	Silicone-free grease	Closed circuits	Open circuits	Permissible medium temperature [°C]	Chilled water	Cooling water [1]	Drinking water	Low-temperature hot water	High-temperature hot water	Water glycol mixture	Saturated steam	Superheated steam	Heat transfer oil on basis of mineral oil	Media containing mineral oils	Refrigerants	Refrigerants (ammonia)	District heating	Boiler plants	Chiller plants	Cooling towers [1]	Domestic hot water [2]	Heating groups	Air handwwling units	Floor heating	Chilled ceilings	Heated and chilled ceilings	VAV [3]	Fan coil units	Zone control
Int. valves	EVG..	■			16	AG		■		1…120	■			■		■ [4]												■	■					□	
	EXG..		■		16	AG		■		1…120	■			■		■ [4]												■	■						
	EVF..	■			16	F		■		1…120	■			■		■ [4]							□					■	■						
	EXF..		■		16	F		■		1…120	■			■		■ [4]												■	■						
PICVs	VPD../VPE..	■			10	AG		■		2…95	■			■		■														■	□		□	□	□
	VQI46../VQP46..	■			25	AG/IG		■		1…90	■			■		■												■	■		■		■	□	■
	VPI46../VPP46..	■			25	AG/IG		■		1…120	■			■		■												■	■		■	□	■	■	□
	VWPG51…			■	25	AG		■		0…90	■			■		■																■		■	
	VPF43../VPF44..	■			16	F	■	■		1…120	■			■		■							□					■	■						
	VPF53../VPF54..	■			25	F	■	■		1…120	■			■		■							□					■	□						
Globe valves	VDN../VEN../VUN..	■			10	AG		■		1…120	■			■		■														■					
	VD1..CLC	■			10	AG		■		1…110	■			■		■															■		□	□	■
	VVP45..	■			16	AG		■		1…110	■			■		■							□	□			□	■	■		□		■	■	□
	VXP45..		■		16	AG		■		1…110	■			■		■								□			□	■	□				□	□	□
	VMP45..		■		16	AG		■		1…110	■			■		■																	□	□	□
	VVP47..	■			16	AG		■		1…110	■			■		■															■		■	■	□
	VXP47..		■		16	AG		■		1…110	■			■		■																	□	□	□
	VMP47..		■		16	AG		■		1…110	■			■		■																	□	□	□
	VVG41..	■			16	AG	■	■	■	-25…150	■	■		■	■	■	■	■					■	□	□		□	■	■						
	VXG41..		■		16	AG	■	■	■	-25…150	■	■		■	■	■								□	□		■	□	□						
	VXG41..01 [4]		■		16	AG	■	■	■	-25…150	■	■	■	■	■	■								□	□		■	□	□						
	VVG44..	■			16	AG	■	■		1…120	■			■		■							□	□			□	■	■						
	VXG44..		■		16	AG	■	■		1…120	■			■		■								□			□	■	■						
	VVG549..	■			25	AG		■		1…130	■	■		■	■	■							■												
	VVI46../2	■			16	IG		■		1…110	■			■		■															■		□	□	■
	VXI46../2		■		16	IG		■		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	AG		■		-10…120	■			■	■	■								□			■	■	■		□		□	□	□
	VBG61..		■		40	AG		■		-10…120	■			■	■	■								□			■	■	□					□	□
	VAI61..	■			40	IG		■		-10…120	■			■	■	■								□			■	■	■		□		□	□	□
	VBI61..		■		40	IG		■		-10…120	■			■	■	■								□			■	■	□					□	□
	VWG41../VWG42..				16	AG/IG	■	■		1…90	■			■	■	■																■		□	
Magnetic valves	MXG461..	■	■		16	AG		■		1…130	■			■		■							□		□		■	□	■						
	MXG461..P	■	■		16	AG		■		1…130									■	■				□				□							
	MXG461B..	■	■		16	AG		■	■	-20…130	■	■	■	■		■									■		■	□							
	MXG461K..																								■										
	MXG461S..	■	■		16	AG		■	■	1…130	■	■		■		■												■	■						
	MXG462S..	■	■		16	AG		■	■	-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				■	■									□				■							
	VFW41..	■			16	F		■		-20…120	■			■	■	■								■	■	■									
	VFL41..	■			16	F		■	■	-20…120	■	■		■		■								■	■	■									
	VAG60..	■			40	AG		■		-20…120	■			■	■	■								■	■										■
	VBG60..		■		40	AG		■		-10…120	■			■	■	■								■	■										■
	VAI60..	■			40	IG		■		-10…120	■			■	■	■								■	■										■
	VBI60..		■		40	IG		■		-10…120	■			■	■	■								■	■										■
Refrigerant valves	M2FP03GX				32	–		■		-40…100											■	■			■										
	M3FK..LX..		■		32	L		■		-40…120											■				■										
	M3FB..LX..		■		PS 43	L		■		-40…120											■				■										
	MVL661..	■			PS 45	L		■		-40…120											■				■										
	MVS661..N	■			63	S/L		■		-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;
IT = internally threaded connection, ET = externally threaded connection, F = flanged connection, S = soldered connection, W = welded connection

Intelligent Valves

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

PN 16 1...120 °C Data sheet A6V11444716	DN	G [Inch]	k_{vs} [m³/h]	$\dot{V}_{min}$ [m³/h]	$\dot{V}_{100}$ [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]
EVG4U10E015	15	G 1B	4	0.45	1.5	1400	600[1]
EVG4U10E020	20	G 1¼B	5	0.9	3	1400	600[1]
EVG4U10E025	25	G 1½B	10	1.35	4.5	1400	600[1]
EVG4U10E032	32	G 2B	11	2.1	7	1000	600[1]
EVG4U10E040	40	G 2¼B	26	3.45	11.5	800	600[1]
EVG4U10E050	50	G 2¾B	30	5.4	18	600	600[1]
EVF4U20E065	65		55	9	30	1600	600[1]
EVF4U20E080	80		80	14.5	48	1600	600[1]
EVF4U20E100	100		113	22.5	75	1600	600[1]
EVF4U20E125	125		142	36	120	1600	600[1]

Typical applications	Valve type	Operating voltage	Positioning signal	Interface
– Heating groups – Air handling units	**EXG4U10E.. DN15-50**	AC/DC 24 V	0...10 V, 2...10 V, 4...20 mA	Modbus RTU BACnet on UDP/IP Ethernet to building operator
	EXF4U20E.. DN65-100	AC/DC 24 V	0...10 V, 2...10 V, 4...20 mA	Modbus RTU BACnet on UDP/IP Ethernet to building operator

PN 16 1...120 °C Data sheet A6V12028437	DN	G [Inch]	k_{vs} [m³/h]	$\dot{V}_{min}$ [m³/h]	$\dot{V}_{100}$ [m³/h]	Δp_{max} [kPa]
EXG4U10E015	15	G 1B	3.7	0.36	1.2	200
EXG4U10E020	20	G 1¼B	4	0.6	2	200
EXG4U10E025	25	G 1½B	8	0.96	3.2	200
EXG4U10E032	32	G 2B	10	1.5	5	200
EXG4U10E040	40	G 2¼B	18	2.4	8	200
EXG4U10E050	50	G 2¾B	26	3.6	12	200
EXF4U20E065	65		55	6	20	150
EXF4U20E080	80		80	9.6	32	75
EXF4U20E100	100		113	15	50	125

Threaded PICVs, on/off

Typical applications	Actuators	Data sheet
– Chilled ceilings – Fan coil units – Zone control	**STA..**	A6V14028280
	SUE21P	A6V11780777

Operating voltage	Positioning signal	Positioning time [s] STA	Positioning time [s] SUE21P
AC 230 V	2-position	270	12
AC/DC 24 V	2-position/PDM	270	–

PN 25 1...90 °C Data sheet	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]
	A6V11877580									
	VQP46.10L0.5	**VQP46.10L0.5Q**	10	½	30	520	30	600	30	600
	VQP46.15L0.5	**VQP46.15L0.5Q**	15	¾	30	520	28	600	28	600
	VQP46.15F1.3	**VQP46.15F1.3Q**	15	¾	300	1300	28	600	28	600
	VQP46.20F1.5	**VQP46.20F1.5Q**	20	1	320	1500	35	600	35	600
	VQP46.25F1.8	**VQP46.25LF.8Q**	25	1 ¼	620	1800	31	600	31	600

PN 25 1...90 °C Data sheet	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]
	A6V11877580									
	VQI46.15L0.5	**VQI46.15L0.5Q**	15	½	30	520	28	600	28	600
	VQI46.15F1.3	**VQI46.15F1.3Q**	15	½	300	1300	28	600	28	600
	VQI46.20F1.5	**VQI46.20F1.5Q**	20	¾	320	1500	35	600	35	600
	VQI46.25F1.8	**VQI46.25F1.8Q**	25	1	620	1800	31	600	31	600

[1] The safety measures must be observed according to the data sheet

Threaded PICVs

Typical applications	Actuators	Data sheet
– Radiators – Chilled ceilings – Fan coil units	**RTN..**	N2111
	STA..	A6V14028280
	SSA..31/61..	A6V11858276
	SSA..HF	A6V11858278
	SSA118..	A6V11858280

Operating voltage	Positioning signal	Positioning time [s]		4.0 mm 100 N	2.5 mm 100 N
AC 230 V	2-position	270	–	**STA321.40L10**	–
	3-position	67.5	–	–	**SSA331.00**
AC 24 V	3-position	67.5	–	–	**SSA131.00**
	0...10 V	270 [1]	–	**STA161.40L10**	–
AC/DC 24 V	2-position/PDM	270	–	**STA121.40L10**	–
	0...10 V	25	–	–	**SSA161.05**
	4...20 mA	25	–	–	**SSA151.05HF**
	0...10 V	25	–	–	**SSA161.05HF**
AC 24 V	KNX S-/LTE-Mode, KNX PL-Link	50	–	–	**SSA118.09HKN**
			RTN51	–	–
			RTN71	–	–
			RTN81	–	–

PN 10 2...95 °C Data sheet	DIN A6V13089932	DN	Rp/R [Inch]	$\dot{V}$ [l/h]	Norm	Δp_{min} [kPa]	Δp_{max} [kPa]	Δp_{min} [kPa]	Δp_{max} [kPa]	Δp_{min} [kPa]	Δp_{max} [kPa]
	VPD110A-135	10	Rp/R ⅜	25...135	DIN	10	60	10	60	10	60
	VPD115A-135	15	Rp/R ½	25...135	DIN	10	60	10	60	10	60
	VPD120A-135	20	Rp/R ¾	25...135	DIN	10	60	10	60	10	60
	VPE110A-135	10	Rp/R ⅜	25...135	DIN	10	60	10	60	10	60
	VPE115A-135	15	Rp/R ½	25...135	DIN	10	60	10	60	10	60
	VPE120A-135	20	Rp/R ¾	25...135	DIN	10	60	10	60	10	60
	VPU110A-135	10	Rp/R ⅜	25...135	DIN	10	60	10	60	10	60
	VPU115A-135	15	Rp/R ½	25...135	DIN	10	60	10	60	10	60
	VPD210A-135	10	Rp/R ⅜	25...135	NF	10	60	10	60	10	60
	VPD215A-135	15	Rp/R ½	25...135	NF	10	60	10	60	10	60
	VPD220A-135	20	Rp/R ¾	25...135	NF	10	60	10	60	10	60
	VPE210A-135	10	Rp/R ⅜	25...135	NF	10	60	10	60	10	60
	VPE215A-135	15	Rp/R ½	25...135	NF	10	60	10	60	10	60
	VPE220A-135	20	Rp/R ¾	25...135	NF	10	60	10	60	10	60

[2] Equal percentage valve characteristic

Threaded-PICVs

Typical applications	Actuators	Data sheet			6,5 mm	2,5 / 5 mm	15 mm	
– Heating groups – Air handling units – Chilled ceilings – VAV – Fan coil units – Zone control	**STA..**	A6V14028280	SSD1....	CE1N4855	125 N	100 N	200 N	
	SSA..31/61..	A6V11858276						
	SSA..HF	A6V11858278						
	SSA118..	A6V11858280						
	SAY..P..	A6V10628469						

Operating voltage	Positioning signal	Notstell-funktion	Positioning time [s] STA	SSA	SAY				
AC 230 V	3-position		–	67,5/135	30	–	**SSA331.00**	**SAY31P03**	
	2-position		270	–	–	**STA321.65L10**	–	–	
AC 24 V	0...10 V		270 [2]	–	30	**STA161.65L10**	–	–	
AC/DC 24 V	3-position		–	67,5/135	30	–	**SSA131.00**	**SAY81P03**	**SSD131.09UT**
	3-position	? [s]							**SSD131.29UT**
	2-Punkt/PDM		270	–	–	**STA121.65L10**	–	–	
	0...10 V		–	25/50	30	–	**SSA161.05**	**SAY61P03**	**SSD161S.05DUT**
	0...10 V	? [s]							**SSD161S.25DUT**
	Modbus RTU		–	–	30	–	–	**SAY61P03/MO**	
	4...20 mA		–	25	–	–	**SSA151.05HF**	–	
	0...10 V		–	25	–	–	**SSA161.05HF**	–	
AC 24 V	KNX S-/ LTE-Mode, KNX PL-Link		–	50	–	–	**SSA118.09HKN**	–	

PN 25 1...120 °C	Without pressure testing points	With pressure testing points	DN	G [Zoll]	$\dot{V}_{min}$ [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]	Δp_{min} [kPa]	Δp_{max} [kPa]
Data sheet	N4855													
	VPP46.10L0.2	**VPP46.10L0.2Q**	10	½	30	200	16	600	16	600	–	–	16	800
	VPP46.10L0.4	**VPP46.10L0.4Q**	10	½	65	370	16	600	16	600	–	–	16	800
	VPP46.15L0.2	**VPP46.15L0.2Q**	15	¾	30	200	19	600	19	600	–	–	19	800
	VPP46.15L0.4	**VPP46.15L0.4Q**	15	¾	65	370	18	600	18	600	–	–	18	800
	VPP46.15L0.6	**VPP46.15L0.6Q**	15	¾	100	575	19	600	19	600	–	–	19	800
	VPP46.20F1.4	**VPP46.20F1.4Q**	20	1	220	1330	22	600	22	600	–	–	22	800
	VPP46.20L0.6	**VPP46.20L0.6Q**	20	1	100	575	19	600	19	600	–	–	19	800
	VPP46.25F1.8	**VPP46.25F1.8Q**	25	1 ¼	250	1800	39	600	39	600	–	–	39	800
	VPP46.32F4	**VPP46.32F4Q**	32	1 ½	550	4001	28	600	28	600	–	–	28	800

PN 25 1...120 °C	Without pressure testing points	With pressure testing points	DN	Rp [Zoll]	$\dot{V}_{min}$ [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]	Δp_{min} [kPa]	Δp_{max} [kPa]
Data sheet	N4855													
	VPI46.15L0.2	**VPI46.15L0.2Q**	15	½	30	200	19	600	19	600	–	–	19	800
	VPI46.15L0.4	**VPI46.15L0.4Q**	15	½	65	370	18	600	18	600	–	–	18	800
	VPI46.15L0.6	**VPI46.15L0.6Q**	15	½	100	575	19	600	19	600	–	–	19	800
	VPI46.20F1.4	**VPI46.20F1.4Q**	20	¾	220	1330	22	600	22	600	–	–	22	800
	VPI46.20L0.6	**VPI46.15L0.6Q**	20	¾	100	575	19	600	19	600	–	–	19	800
	VPI46.25F1.8	**VPI46.25F1.8Q**	25	1	250	1800	39	600	39	600	–	–	39	800
	VPI46.32F4	**VPI46.32F4Q**	32	1 ¼	550	4001	38	600	28	600	–	–	28	800
	–	**VPI46.40F9.5Q**	40	1 ½	1370	9500	–	–	–	–	25	600	–	–
	–	**VPI46.50F12Q**	50	2	1400	11500	–	–	–	–	36	600	–	–

PN 25 120 °C	Without pressure testing points	With pressure testing points	DN	G [Zoll]	$\dot{V}_{min}$ [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]	Δp_{min} [kPa]	Δp_{max} [kPa]
Data sheet	N4855													
	VPP46.15F1.4	**VPP46.15F1.4Q**	15	½	220	1330	22	600	22	600	–	–	22	800
	VPP46.20F1.8	**VPP46.20F1.8Q**	20	1	300	1800	40	600	40	600	–	–	40	800
	VPP46.25F3.6	**VPP46.25F3.6Q**	25	1 ¼	600	3609	23	600	23	800	–	–	23	800

PN 25 1...120 °C	Without pressure testing points	With pressure testing points	DN	Rp [Zoll]	$\dot{V}_{min}$ [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]	Δp_{min} [kPa]	Δp_{max} [kPa]
Data sheet	N4855													
	VPI46.15F1.4	**VPI46.15F1.4Q**	15	½	220	1330	22	600	22	600	–	–	22	800
	VPI46.20F1.8	**VPI46.20F1.8Q**	20	1	300	1800	40	600	40	600	–	–	40	800
	VPI46.25F3.6	**VPI46.25F3.6Q**	25	1 ¼	600	3609	23	600	23	800	–	–	23	800

[2] Equal percentage valve characteristic

6-port pressure independent control ball valves

Typical applications	Actuators	Data sheet	5 Nm
– Heated and chilled ceilings – Fan coil units	**GDB..9E..6..**	A6V12986395	

Operating voltage	Positioning signal	Positoning time [s] GDB	Cable	
AC/DC 24 V	0/2...10 V	150	0.9 m	**GDB161.9E/6W**
	0/2...10 V	150	0.9 m	**GDB161.9E/6P**
	0/2...10 V	150	3 m	**GDB161.9G/6W**
	0/2...10 V	150	3 m	**GDB161.9G/6P**
	0/2...10 V	150	5 m	**GDB161.9H/6W**
	0/2...10 V	150	5 m	**GDB161.9H/6P**
	Modbus RTU	150	0.9 m	**GDB161.9E/MO6P**

PN 25 0...90 °C			DN	G [Inch]	$\dot{V}_{min}$ [l/h]	$\dot{V}_{100}$ [l/h]	Δp_{min} [kPa]	Δp_{max} [kPa]
Data sheet	A6V11466366							
	VWPG51.15L0.9	VWPG51.15L0.9Q	15	¾	35	820	18	400
	VWPG51.15F1.2	VWPG51.15F1.2Q	15	¾	210	1200	23	400
	VWPG51.20F4.3	VWPG51.20F4.3Q	20	1	460	4250	38	400

Fittings for 6-port pressure independent control ball valves

Type	Connection Valve	Coupling	Description
ALN14.152B	**G ¾ "**	**R ½ "**	Fittings set made of DZR brass, consisting of: – 2x cap nuts – 2x cap nuts with sleeves and insert per ISO 228-1 – 2x flat seals
ALN14.202B	**G ¾ "**	**R ¾ "**	
ALN15.202B/1	**G 1 "**	**R ¾ "**	
ALN15.252B	**G 1 "**	**R 1 "**	
ALP55	**G ¾ "**	**G ½ "A**	Fittings set made of DZR brass, consisting of: – 1x cap nuts – 1x P/T coupling with sleeves and insert per ISO 228-1 – 1x flat seals
ALP56	**G ¾ "**	**G ¾ "A**	
ALP57	**G 1 "**	**G ¾ "A**	
ALP58	**G 1 "**	**G 1 "A**	
ALP59	**VWPG51.15..**	**–**	Spare nipple P/T port fopr body valve
ALP60	**VWPG51.20..**	**–**	

Flanged PICVs

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



Operating voltage	Positioning signal	Positioning time [s] SAX	SQV	SAV	Spring return function [s]	20 mm 500 N	20 / 40 mm 1100 N	40 mm 1100 N
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	Modbus RTU	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	A6V12273951							
	VPF44.50F15 [3]	50	3.7	14.3	25	800	800	–
	VPF44.50F25 [3]	50	5.7	24.6	55	800	800	–
	VPF44.65F25 [3]	65	4.5	24.4	32	800	800	–
	VPF44.65F35 [3]	65	6.4	37.7	50	800	800	–
	VPF44.80F35 [3]	80	6.8	35.7	22	800	800	–
	VPF44.80F45 [3]	80	8.5	49	40	800	800	–
	VPF44.100F70	100	12.2	69.6	33	–	800	800
	VPF44.100F90	100	14.8	90.9	75	–	800	800
	VPF44.125F110	125	15	112	30	–	800	800
	VPF44.125F135	125	18	132	45	–	800	800
	VPF44.150F150	150	19	150	30	–	800	800
	VPF44.150F200	150	26	208	50	–	800	800
	VPF43.200F210 [4]	200	95	210	32	–	800	800
	VPF43.200F280 [4]	200	130	280	78	–	800	800

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	A6V12273951							
	VPF54.50F15	50	3.7	14.3	25	800	800	–
	VPF54.50F25	50	5.7	24.6	55	800	800	–
	VPF54.65F25	65	4.5	24.4	32	800	800	–
	VPF54.65F35	65	6.4	37.7	50	800	800	–
	VPF54.80F35	80	6.8	34.7	22	800	800	–
	VPF54.80F45	80	8.5	49.9	40	800	800	–
	VPF54.100F70	100	12.2	69.6	33	–	800	800
	VPF54.100F90	100	14.8	90.9	45	–	800	800
	VPF54.125F110	125	15	112	30	–	800	800
	VPF54.125F135	125	18	132	45	–	800	800
	VPF54.150F150	150	19	150	30	–	800	800
	VPF54.150F200	150	26	208	50	–	800	800
	VPF53.200F210 [4]	200	95	210	32	–	800	800
	VPF53.200F280 [4]	200	130	280	78	–	800	800

[1] Fail-safe function: valve closed
[2] Fail-safe function: valve open
[3] Concerns valve type from series B
[4] Max. medium temperature 110 °C

Threaded globe valves

Typical applications	Actuators	Data sheet
– Radiators	**RTN..**	N2111



Typical applications	Actuators	Data sheet	Operating voltage	Positioning signal	Positioning time [s]	RTN51/RTN51G 4.0 mm 100 N	RTN71	RTN81 2.5 mm 100 N
– Radiators	**STA..**	A6V14028280						
	SSA..31/61..	A6V11858276						
	SSA..HF	A6V11858278						
	SSA118..	A6V11858280						
			AC 230 V	2-position	270	**STA321.40L10**		–
				3-position	67.5	–		**SSA331.00**
			AC 24 V	3-position	67.5	–		**SSA131.00**
				0...10 V	270 [1]	**STA161.40L10**		–
			AC/DC 24 V	2-position/PDM	270	**STA121.40L10**		–
				0...10 V	25	–		**SSA161.05**
				4...20 mA	25	–		**SSA151.05HF**
				0...10 V	25	–		**SSA161.05HF**
			AC 24 V	KNX S-/LTE-Mode, KNX PL-Link	50	–		**SSA118.09HKN**
			Normally Open/Normally Closed (for radiator valves)			**NC**		–

PN 10	1...120 °C	DIN	NF	DN	Rp/R [Inch]	k_v [m³/h]	Δp_{max} [kPa]	Δp_{max} [kPa]
Data sheet		N2105	N2106					
		VDN110	**VDN210**	10	Rp/R ⅜	0.09...0.63	60	60
		VDN115	**VDN215**	15	Rp/R ½	0.10...0.89	60	60
		VDN120	**VDN220**	20	Rp/R ¾	0.31...1.41	60	60
		VEN110	**VEN210**	10	Rp/R ⅜	0.09...0.63	60	60
		VEN115	**VEN215**	15	Rp/R ½	0.10...0.89	60	60
		VEN120	**VEN220**	20	Rp/R ¾	0.31...1.41	60	60
		–	**VUN210**	10	Rp/R ⅜	0.14...0.60	60	60
		–	**VUN215**	15	Rp/R ½	0.13...0.77	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	0.26	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	Operating voltage	Positioning signal	Positioning time [s]	4.0 mm 100 N	2.5 mm 100 N
– Chilled ceilings	**STA..**	A6V14028280					
	SSA..31/61..	A6V11858276					
	SSA..HF	A6V11858278					
	SSA118..	A6V11858280					
			AC 230 V	2-position	270	**STA321.40L10**	–
				3-position	67.5	–	**SSA331.00**
			AC 24 V	3-position	67.5	–	**SSA131.00**
				0...10 V	270 [1]	**STA161.40L10**	–
			AC/DC 24 V	2-position/PDM	270	**STA121.40L10**	–
				0...10 V	25	–	**SSA161.05**
				4...20 mA	25	–	**SSA151.05HF**
				0...10 V	25	–	**SSA161.05HF**
				0...10 V	25	–	**SSA161E.05HF**
			AC 24 V	KNX S-/LTE-Mode, KNX PL-Link	50	–	**SSA118.09HKN**
			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] 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, A6V12681511, A6V15348908			200 N	200 N
	Operating voltage	**Positioning signal**	**Positioning time [s]**	**Auxiliary switch** SSB..1.1		
	AC 230 V	3-position	150	✓	**SSB331.09H**	**SSB31.1**
	AC 24 V	3-position	150	✓	**SSB131.09H**	**SSB81.1**
	AC/DC 24 V	0...10 V	27.5	–	**SSB161.05HF**	–
		0...10 V	27.5	–	**SSB161.05UT**	–

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			6.5 mm	2.5 mm	
– Chilled ceilings – VAV – Fan coil units	**STP..** **SFP..** **SSF..**	A6V14028280 N4865 A6V12681511, A6V15348910			125 N	135 N	160 N
	Operating voltage	**Positioning signal**	**Positioning time [s]**	**Spring return function [s]**			
	AC 230 V	2-position	270	–	**STP321.65L10**	–	–
		2-position	10	30...50	–	**SFP21/18**	–
		3-position	150	–	–	–	**SSF331.09H**
	AC 24 V	2-position	10	30...50	–	**SFP71/18**	–
		3-position	150	–	–	–	**SSF131.09H**
		0...10 V	270 [2]	–	**STP161.65L10**	–	–
	AC/DC 24 V	2-position/PDM	270	–	**STP121.65L10**	–	–
		0...10 V	12.5	–	–	–	**SSF161.05HF**

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 15

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			2.5 mm		6.0 mm	2,5 mm
– Floor heating – Fan coil units – Zone control	**SFA..** **SUA21/3** **STA..** **SSA31.04** [1]	N4863 A6V10446174 A6V14028280 N4860			200 N	170 N	125 N	160 N
	Operating voltage	**Positioning signal**	**Positioning time [s]**	**Spring return function [s]**				
	AC 230 V	2-position	10	30...50	**SFA21/18**	–	–	–
		2-position	270	–	–	–	**STA321.65L10**	–
		2-position/SPST [2]	10	–	–	**SUA21/3**	–	–
		3-position/SPDT [2]	43	–	–	–	–	**SSA31.04**
	AC 24 V	2-position	10	30...50	**SFA71/18**	–	–	–
		0...10 V	270 [3]	–	–	–	**STA161.65L10**	–
	AC/DC 24 V	2-position/PDM	270	–	–	–	**STA121.65L10**	–

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	300	300
	VVI46.20/2	20	Rp ¾	3.5	300	300	400	400	200	200	300	300
	VVI46.25/2	25	Rp 1	5	250	250	250	250	150	150	230	230
	**VXI46.15/2** [4]	15	Rp ½	2	–	300	–	400	–	200	–	300
	VXI46.20/2 [4]	20	Rp ¾	3.5	–	300	–	400	–	200	–	300
	VXI46.25/2 [4]	25	Rp 1	5	–	250	–	250	–	150	–	230
	VXI46.25T/2	25	Rp 1	5	–	200	–	200	–	140	–	–

Thermal actuators and available cable lengths

For Actuators	PVC Cabel (Type)				Halogenfree Cabel (Type)		
	Cabel length				Cabel length		
	1 m	2 m	5 m	10 m	1 m	5 m	10 m
STA121.65/00 STA321.65/00 STP121.65/00 STP321.65/00	ASY21L10	ASY21L20	ASY21L50	ASY21L100	ASY21L10	ASY21L50	ASY21L100

For Actuators	PVC Cabel, without Feedback signal (Type)				Halogenfree Cabel, without Feedback signal (Type)		
	Cabel length				Cabel length		
	1 m	2 m	5 m	10 m	1 m	5 m	10 m
STA161.65L10 STA162.65L10 STP161.65L10 STP162.65L10	ASY61L10	ASY61L20	ASY61L50	ASY61L100	ASY61L10H	ASY61L50H	ASY61L100H

For Actuators	PVC Cabel, with Feedback signal (Type)				Halogenfree Cabel, with Feedback signal (Type)		
	Cabel length				Cabel length		
	1 m	2 m	5 m	10 m	1 m	5 m	10 m
STA161.65L10 STA162.65L10 STP161.65L10 STP162.65L10	ASY62L10	ASY62L20	ASY62L50	ASY62L100	ASY62L10H	ASY62L50H	ASY62L100H

[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

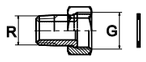
Threaded globe valves

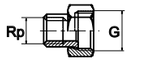
Typical applications	Actuators	Data sheet						Spring return function [s]	20 mm 800 N	20 mm 1000 N	20 mm 2800 N
– District heating – Boiler plants – Chiller plants – Domestic hot water – Heating groups – Air handling units	**SAX..** **SKD..** **SKB..**	N4501 N4561 N4564									
	Operating voltage	**Positioning signal**	**Positioning time [s]**								
			SAX	SKD	SKB	SKD	SKB				
	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**
Modbus	AC/DC 24 V	0...10 V, 4...20 mA	30	–	–	–	–		**SAX61.03**	–	–
		Modbus RTU	30	30	120	15	10		**SAX61.03/MO**	**SKD62/MO**	**SKB62/MO**

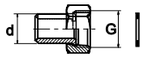
PN 16	-25...150 °C [2]			DN	G [Inch]	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	N4363		N4463									
	VVG41.11..12		–	15	G 1B	0.63 / 1	1600	800	1600	800	1600	800
	VVG41.13		–	**VXG41.1301** [3]	15	G 1B	1.6	1600	800	1600	800	1600	800
	VVG41.14		–	**VXG41.1401** [3]	15	G 1B	2.5	1600	800	1600	800	1600	800
	**VVG41.15**		**VXG41.15**	**VXG41.1501** [3]	15	G 1B	4	1600	800	1600	800	1600	800
	VVG41.20		**VXG41.20**	**VXG41.2001** [3]	20	G 1¼B	6.3	1600	800	1600	800	1600	800
	VVG41.25		**VXG41.25**	**VXG41.2501** [3]	25	G 1½B	10	1550	800	1600	800	1600	800
	VVG41.32		**VXG41.32**	**VXG41.3201** [3]	32	G 2B	16	875	800	1275	800	1600	800
	VVG41.40		**VXG41.40**	**VXG41.4001** [3]	40	G 2¼B	25	525	525	775	775	1600	800
	VVG41.50		**VXG41.50**	**VXG41.5001** [3]	50	G 2¾B	40	300	300	450	450	1225	800

Union nuts for threaded valves [4]

Type Set of 2	Set of 3	G [Inch]	R, Rp [Inch]	Material
ALG132	**ALG133**	G ½B	R ⅜ (External threading)	Brass
ALG142	**ALG143**	G ¾B	R ½ (External threading)	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 Set of 2	G [Inch]	Ø d [mm]	Material
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] Max. 90 °C
[4] 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	Actuators	Data sheet			5.5 mm 400 N	5.5 mm 400 N	5.5 mm 400 N
– Boiler plants – Domestic hot water – Heating groups – Air handling units	**SAS..**	N4581					
	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		Modbus RTU	30	–	**SAS61.03/MO**	–	–
		Modbus RTU	30	14	–	–	**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	Actuators	Data sheet			5.5 mm 300 N
– Boiler plants – Heating groups – Air handling units	**SSC..**	A6V15348909, A6V12681511			
	Operating voltage	**Positioning signal**	**Positioning time [s]**	**Spring return function [s]**	
	AC 230 V	3-position	150	–	**SSC331.09H**
	AC 24 V	3-position	150	–	**SSC131.09H**
	AC/DC 24 V	0...10 V	27.5	–	**SSC161.05HF**
		0...10 V	27.5	–	**SSC161.05UT**
		0...10 V	27.5	33	**SSC161.35HF**

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	Actuators	Data sheet		5.5 mm 300 N	5.5 mm 300 N
– District heating – Boiler plants	**SAT..**	N4584			
	Operating voltage	**Positioning 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		Modbus RTU	15	–	**SAT61.008/MO**	–
		Modbus RTU	15	8	–	**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..**	N4503
– 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 RTU	30	30	120	15	10/20	**SAX61.03/MO**	**SKD62/MO**	**SKB62/MO**	**SAV61.00/MO**	**SKC62/MO**

Modbus

PN 6	-10...130 °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	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 [4]		**–**	50	40	1600	400	1600	400	1600	400	–	–	–	–
	VVF42.65-63K [4]		**–**	65	63	1600	400	1600	400	1600	400	–	–	–	–
	VVF42.80-100K [4]		**–**	80	100	1600	400	1600	400	1600	400	–	–	–	–
	VVF42.100-160K [4]		**–**	100	160	–	–	–	–	–	–	1600	400	1600	400
	VVF42.125-250K [4]		**–**	125	250	–	–	–	–	–	–	1600	400	1600	400
	VVF42.150-360K [4]		**–**	150	360	–	–	–	–	–	–	1400	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 [4]		**–**	65	63	–	–	–	–	–	–	–	–	1600	800
	VVF43.80-100K [4]		**–**	80	100	–	–	–	–	–	–	–	–	1600	800
	VVF43.100-150K [4]		**–**	100	150	–	–	–	–	–	–	–	–	1600	800
	VVF43.125-220K [4]		**–**	125	220	–	–	–	–	–	–	–	–	1600	800
	VVF43.150-315K [4]		**–**	150	315	–	–	–	–	–	–	–	–	1600	800
	VVF43.200-450K [4]		**–**	200	450	–	–	–	–	–	–	–	–	1200	800
	VVF43.250-630K [4]		**–**	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.. [4] Min. -5 °C

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..**	N4503
– 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	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 RTU	30	30	120	15	10/20	**SAX61.03/MO**	**SKD62/MO [1]**	**SKB62/MO [1]**	**SAV61.00/MO**	**SKC62/MO**

Modbus

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	750	700	–	–
	VVF53.50-40		**VXF53.50-40**	50	40	350	300	450	400	1200	1150	750	700	–	–
	VVF53.65-63		**VXF53.65-63**	65	63	–	–	–	–	–	–	450	400	700	650
	VVF53.100-160		**VXF53.100-160**	100	160	–	–	–	–	–	–	160	125	300	250
	VVF53.125-250		**VXF53.125-250**	125	250	–	–	–	–	–	–	125	90	190	160
	VVF53.150-400		**VXF53.150-400**	150	400	–	–	–	–	–	–	80	60	125	100
	VVF53.50-40K [4]		**–**	50	36	–	–	2500	1250	2500	1250	–	–	–	–
	VVF53.65-63K [4]		**–**	65	63	–	–	–	–	–	–	–	–	2500	1250
	VVF53.80-100K [4]		**–**	80	100	–	–	–	–	–	–	–	–	2500	1250
	VVF53.100-150K [4]		**–**	100	150	–	–	–	–	–	–	–	–	2500	1250
	VVF53.125-220K [4]		**–**	125	220	–	–	–	–	–	–	–	–	2500	1250
	VVF53.150-315K [4]		**–**	150	315	–	–	–	–	–	–	–	–	2500	1250
	VVF53.200-450K [4]		**–**	200	450	–	–	–	–	–	–	–	–	1200	800
	VVF53.250-630K [4]		**–**	250	630	–	–	–	–	–	–	–	–	1200	800

[1] SK../MO = AC 24 V [2] SAX.. max. 130 °C, SKD.. max. 150 °C [3] .. = insert k_{vs} value [4] Min. -5 °C

Flanged globe valves

Typical applications	Actuators	Data sheet						20 mm		40 mm
– District heating – Boiler plants – Chiller plants – Domestic hot water – Heating groups – Air handling units	**SKD..** **SKB..** **SAV..** **SKC..**	**N4561** **N4564** **N4503** **N4566**						1000 N	2800 N	2800 N
	Operating voltage	**Positioning signal**	**Positioning time [s]** SKD	SKB/C	SAV	**Spring return function [s]** SKD	SKB/C			
	AC 230 V	3-position	120	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	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	120	–	–	**SKD60**	**SKB60**	**SKC60**
		0...10 V, 4...20 mA	30	120	–	15	10/20	**SKD62**	**SKB62**	**SKC62**
	Modbus	RTU	30	120	120	15	10/20	**SKD62/MO**	**SKB62/MO**	**SKC62/MO**

PN 40	-25...220 °C	DN	k_{vs} [m^3/h]	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	16	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
	VVF63.150-315	150	315	–	–	–	–	125	100

PN 40	-5...220 °C	DN	k_{vs} [m^3/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} [m^3/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	A6V11459527			A⇒AB, B	AB⇒A, B	A⇒AB, B	AB⇒A, B	A⇒AB, B	AB⇒A, B
	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					2 Nm	5 Nm	7 Nm	10 Nm GLB 8 Nm GLD
– 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]** G..D	G..B	GMA	**Spring return function [s]**				
	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 RTU	–	150	–	–	**–**	**GDB111.9E/MO**	**–**	**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	–	–	–	**–**	**GDD161.9E**	**–**	**GLD161.9E**
		Modbus RTU	–	150	90	–	**–**	**GDB161.9E/MO**	**GMA161.9E/MO**	**GLB161.9E/MO**

PN 40	-10...120 °C			DN	G [Inch]	k_{vs} [m^3/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} [m^3/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-..		**VBI61.15-..**	15	Rp ½	0,25/0,4/0,6	1400	350	1400	350	600	350	1400	350
	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 – Fan coil units	**GSD..9A** **GDB..9E...** **GDB111.9E/KN**	A6V10636056 A6V10636150 A6V10725318

Operating voltage	Positioning signal	Positioning time [s] GSD	Positioning time [s] GDB	2 Nm	5 Nm	5 Nm	5 Nm
AC 100...240 V	2-position	–	150	–	**GDB341.9E**	–	–
AC 230 V	2-position	30	–	**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	–	–	–	**GDB161.9E/6W**
	Modbus RTU	–	150	–	–	–	**GDB161.9E/MO6P**

PN 16	5...90 °C	DN	k_{vs} links [m³/h]	k_{vs} rechts [m³/h]	2 Nm Δp_s [kPa]	2 Nm Δp_{max} [kPa]	5 Nm Δp_s [kPa]	5 Nm Δp_{max} [kPa]	5 Nm Δp_s [kPa]	5 Nm Δp_{max} [kPa]	5 Nm Δp_s [kPa]	5 Nm Δp_{max} [kPa]
Datenblatt	A6V10564480											
VWG41.20-0.25-2.5		20	0.25	2.5	–	–	–	200	–	200	–	200
VWG41.20-0.25-3.45		20	0.25	3.45	–	–	–	200	–	200	–	200
VWG41.20-0.25-4.25		20	0.25	4.25	–	–	–	200	–	200	–	200
VWG41.20-0.4-2.5		20	0.4	2.5	–	–	–	200	–	200	–	200
VWG41.20-0.4-3.45		20	0.4	3.45	–	–	–	200	–	200	–	200
VWG41.20-0.4-4.25		20	0.4	4.25	–	–	–	200	–	200	–	200
VWG41.20-0.65-2.5		20	0.65	2.5	–	–	–	200	–	200	–	200
VWG41.20-0.65-3.45		20	0.65	3.45	–	–	–	200	–	200	–	200
VWG41.20-0.65-4.25		20	0.65	4.25	–	–	–	200	–	200	–	200
VWG41.20-1.0-2.5		20	1	2.5	–	–	–	200	–	200	–	200
VWG41.20-1.0-3.45		20	1	3.45	–	–	–	200	–	200	–	200
VWG41.20-1.0-4.25		20	1	4.25	–	–	–	200	–	200	–	200
VWG41.20-1.3-2.5		20	1.3	2.5	–	–	–	200	–	200	–	200
VWG41.20-1.3-3.45		20	1.3	3.45	–	–	–	200	–	200	–	200
VWG41.20-1.3-4.25		20	1.3	4.25	–	–	–	200	–	200	–	200
VWG41.20-1.6-2.5		20	1.6	2.5	–	–	–	200	–	200	–	200
VWG41.20-1.6-3.45		20	1.6	3.45	–	–	–	200	–	200	–	200
VWG41.20-1.6-4.25		20	1.6	4.25	–	–	–	200	–	200	–	200
VWG41.20-2.5-2.5		20	2.5	2.5	–	–	–	200	–	200	–	200
VWG41.20-2.5-3.45		20	2.5	3.45	–	–	–	200	–	200	–	200
VWG41.20-2.5-4.25		20	2.5	4.25	–	–	–	200	–	200	–	200
VWG41.20-3.45-3.45		20	3.45	3.45	–	–	–	200	–	200	–	200
VWG41.20-4.25-4.25		20	4.25	4.25	–	–	–	200	–	200	–	200

Fittings for 6-port control ball valves

Type	Description
ALN15.156B **ALN15.206B**	Internally threaded G (BSPP) to ISO 228-1 (valve side); externally threaded G (BSPP) to ISO 228-1(pipe side). Each fittings set ALN13.156B consists of 6x cap nuts, 6x cap nuts with sleeves and inserts, and 6x flat seals.
ALG13.156B **ALG15.156B** **ALG15.206B** **ALG15.256B**	IInternally threaded G (BSPP) to ISO 228-1 (valve side); internally threaded G (BSPP) to ISO 228-1 (pipe side). Each fittings set with 6x cap nuts, 6x cap nuts with sleeves and inserts, and 6x flat seals.

6-port compact control ball valves

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

Operating voltage	Positioning signal	Positioning time [s] GSD	Positioning time [s] GDB	2 Nm	5 Nm	5 Nm	5 Nm
AC 100...240 V	2-position	–	150	–	**GDB341.9E**	–	–
AC 230 V	2-position	30	–	**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	–	–	–	**GDB161.9E/6W**
	Modbus RTU	–	150	–	–	–	**GDB161.9E/MO6P**

PN 16	5...90 °C	DN	k_{vs} left [m³/h]	k_{vs} right [m³/h]	2 Nm Δp_s [kPa]	2 Nm Δp_{max} [kPa]	5 Nm Δp_s [kPa]	5 Nm Δp_{max} [kPa]	5 Nm Δp_s [kPa]	5 Nm Δp_{max} [kPa]	5 Nm Δp_s [kPa]	5 Nm Δp_{max} [kPa]
Data sheet	A6V10564480											
VWG42.10-0.25-0.25		10	0.25	0.25	–	200	–	200	–	200	–	200
VWG42.10-0.25-0.4		10	0.25	0.4	–	200	–	200	–	200	–	200
VWG42.10-0.25-0.65		10	0.25	0.65	–	200	–	200	–	200	–	200
VWG42.10-0.25-1.0		10	0.25	1.0	–	200	–	200	–	200	–	200
VWG42.10-0.25-1.3		10	0.25	1.3	–	200	–	200	–	200	–	200
VWG42.10-0.25-1.6		10	0.25	1.6	–	200	–	200	–	200	–	200
VWG42.10-0.25-1.95		10	0.25	1.95	–	200	–	200	–	200	–	200
VWG42.10-0.4-0.4		10	0.4	0.4	–	200	–	200	–	200	–	200
VWG42.10-0.4-0.65		10	0.4	0.65	–	200	–	200	–	200	–	200
VWG42.10-0.4-1.0		10	0.4	1.0	–	200	–	200	–	200	–	200
VWG42.10-0.4-1.3		10	0.4	1.3	–	200	–	200	–	200	–	200
VWG42.10-0.4-1.6		10	0.4	1.6	–	200	–	200	–	200	–	200
VWG42.10-0.4-1.95		10	0.4	1.95	–	200	–	200	–	200	–	200
VWG42.10-0.65-0.65		10	0.65	0.65	–	200	–	200	–	200	–	200
VWG42.10-0.65-1.0		10	0.65	1.0	–	200	–	200	–	200	–	200
VWG42.10-0.65-1.3		10	0.65	1.3	–	200	–	200	–	200	–	200
VWG42.10-0.65-1.6		10	0.65	1.6	–	200	–	200	–	200	–	200
VWG42.10-0.65-1.95		10	0.65	1.95	–	200	–	200	–	200	–	200
VWG42.10-1.0-1.0		10	1	1.0	–	200	–	200	–	200	–	200
VWG42.10-1.0-1.3		10	1	1.3	–	200	–	200	–	200	–	200
VWG42.10-1.0-1.6		10	1	1.6	–	200	–	200	–	200	–	200
VWG42.10-1.0-1.95		10	1	1.9	–	200	–	200	–	200	–	200
VWG42.10-1.3-1.3		10	1.3	1.3	–	200	–	200	–	200	–	200
VWG42.10-1.3-1.6		10	1.3	1.6	–	200	–	200	–	200	–	200
VWG42.10-1.3-1.95		10	1.3	1.95	–	200	–	200	–	200	–	200
VWG42.10-1.6-1.6		10	1.6	1.6	–	200	–	200	–	200	–	200
VWG42.10-1.6-1.95		10	1.6	1.95	–	200	–	200	–	200	–	200
VWG42.10-1.95-1.95		10	1.95	1.95	–	200	–	200	–	200	–	200

Fittings for 6-port compact control ball valves

Type	Description
ALN13.156B	Internally threaded G (BSPP) to ISO 228-1 (valve side); externally threaded G (BSPP) to ISO 228-1 (pipe side). Each fittings set ALN13.156B consists of 6x cap nuts, 6x cap nuts with sleeves and inserts, and 6x flat seals
ALG13G156B	Internally threaded G (BSPP) to ISO 228-1 (valve side); internally threaded G (BSPP) to ISO 228-1 (pipe side). Each fittings set with 6x cap nuts, 6x cap nuts with sleeves and inserts, and 6x flat seals.

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}	Δp_s	Δp_{max}	**Note**
Data sheet	N4455		[m³/h]	[kPa]	**[kPa]**	
	**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	
	1...120 °C	DN	k_{vs}	Δp_s	Δp_{max}	
	N4454		[m³/h]	[kPa]	[kPa]	
	M3P80FY	80	80	300	300	
	M3P100FY	100	130	200	200	
PN 16	1...180 °C	DN	k_{vs}	Δp_s	Δp_{max}	
Data sheet	N4361		[m³/h]	[kPa]	[kPa]	
	**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	k_{vs}	Δp_s	Δp_{max}
Data sheet	N4455		[Inch]	[m³/h]	[kPa]	[kPa]
	**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	-40...130 °C	DN	G	k_{vs}	Δp_s	Δp_{max}
Data sheet	N4461	A6V14702494		[Inch]	[m³/h]	[kPa]	[kPa]
	MXG461B15-.. [2]	**MXG461K15-..** [2]	15	G 1B	0.6 / 1.5 / 3	1000	1000
	MXG461B20-5	**MXG461K20-5**	20	G 1¼B	5	800	800
	MXG461B25-8	**MXG461K25-8**	25	G 1½B	8	700	700
	MXG461B32-12	**MXG461K32-12**	32	G 2B	12	600	600
	MXG461B40-20	**MXG461K40-20**	40	G 2¼B	20	600	600
	MXG461B50-30	**MXG461K50-30**	50	G 2¾B	30	600	600

PN 16	1...130 °C	-20...130 °C	DN	G	k_{vs}	Δp_s	Δp_{max}	**Note**
Data sheet	N4465	N4466		[Inch]	[m³/h]	[kPa]	[kPa]	
	**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	
		MXG462S40-20	40	G 2¼B	20	600	600	
	–	**MXG462S50-30**	50	G 2¾B	30	600	600	

Slipper valves

Typical applications	Actuators	Data sheet
– Boiler plants – Heating groups	**SAL..**	N4502

	Operating voltage	Positioning signal	Positioning time [s]	10 Nm	10 Nm
					
	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}	Δp_{max}	Δp_{max}
Data sheet	N4241		[m³/h]	[kPa]	[kPa]
	**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

Butterfly valves

Typical applications	Actuators	Data sheet
– Boiler plants – Chiller plants – Heating groups	**SAL..**	N4502

	Operating voltage	Positioning signal	Positioning time [s]	Rotation angle 90° 10 Nm
				
	AC 230 V AC/DC 24 V	3-position	30	**SAL31.03T10/F05**
		3-position	30	**SAL81.03T10/F05**
		0...10 V, 4...20 mA	30	**SAL61.03T10/F05**

PN 6/10/16	-20...120 °C	DN	k_{vs}	Δp_s
Data sheet	A6V101029254		[m³/h]	[kPa]
	**VFW41.40U**	40	40	500
	VFW41.50U	50	100	500
	VFW41.65U	65	155	500
	VFW41.80U	80	260	500
	VFW41.100U	100	520	500
	VFW41.125U	125	820	300
	VFW41.150U	150	1600	250
	VFW41.200U	200	4000	125

[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°						
– Boiler plants – Chiller plants – Cooling towers – Domestic hot water – Heating groups	**SAL..** **SQL3...**	N4502 A6V13343014	20 Nm	40 Nm	25 Nm	40 Nm	100 Nm	400 Nm	1200 Nm
									
Operating voltage	**Positioning signal**	**Positioning time [s]**							
AC 230 V	3-position	39	–	–	–	–	**SQL341E100**	–	–
	3-position	47	–	–	–	–	–	**SQL341E400**	**SQL341E1200**
	3-position	11	–	–	**SQL341E25**	–	–	–	–
	3-position	22	–	–	–	**SQL341E40**	–	–	–
	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**	–	–	–	–	–
AC 230 V	0...10 V, 4...20 mA	11	–	–	**SQL361E25**	–	–	–	–
	0...10 V, 4...20 mA	22	–	–	–	**SQL361E40**	–	–	–
	0...10 V, 4...20 mA	39	–	–	–	–	**SQL361E100**	–	–
	0...10 V, 4...20 mA	47	–	–	–	–	–	**SQL361E400**	**SQL3641E1200**

PN 16	-20...120°C	DN	k_{vs}	Δp_s	Δp_s	Δp_s	Δp_s	Δp_s	Δp_s	Δp_s
Data sheet	A6V12436917		[m³/h]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]
	**VFW41.40**	40	40	1600	–	1600	–	–	–	–
	VFW41.50	50	100	1600	–	1600	–	–	–	–
	VFW41.65	65	155	1600	–	1600	–	–	–	–
	VFW41.80	80	260	–	1600	–	1600	–	–	–
	VFW41.100	100	520	–	1200	–	1600	–	–	–
	VFW41.125	125	820	–	800	–	1000	–	–	–
	VFW41.150	150	1600	–	–	–	–	1600	–	–
	VFW41.200	200	4000	–	–	–	–	1000	–	–
	VFW41.250	250	4550	–	–	–	–	–	1000	–
	VFW41.300	300	7200	–	–	–	–	–	1000	–
	VFW41.350	350	10250	–	–	–	–	–	600	–
	VFW41.400	400	14100	–	–	–	–	–	300	–
	VFW41.450	450	18500	–	–	–	–	–	–	300
	VFW41.500	500	24000	–	–	–	–	–	–	300
	VFW41.600	600	31000	–	–	–	–	–	–	300

PN 16	-20...120°C	DN	k_{vs}	Δp_s	Δp_s	Δp_s	Δp_s	Δp_s	Δp_s	Δp_s
Data sheet	A6V12436917		[m³/h]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]
	**VFL41.40**	40	40	1600	–	1600	–	–	–	–
	VFL41.50	50	100	1600	–	1600	–	–	–	–
	VFL41.65	65	155	1600	–	1600	–	–	–	–
	VFL41.80	80	260	–	1600	–	1600	–	–	–
	VFL41.100	100	520	–	1200	–	1600	–	–	–
	VFL41.125	125	820	–	800	–	1000	–	–	–
	VFL41.150	150	1600	–	–	–	–	1600	–	–
	VFL41.200	200	4000	–	–	–	–	1000	–	–
	VFL41.250	250	4550	–	–	–	–	–	1000	–
	VFL41.300	300	7200	–	–	–	–	–	1000	–
	VFL41.350	350	10250	–	–	–	–	–	600	–
	VFL41.400	400	14100	–	–	–	–	–	300	–
	VFL41.450	450	18500	–	–	–	–	–	–	300
	VFL41.500	500	24000	–	–	–	–	–	–	300
	VFL41.600	600	31000	–	–	–	–	–	–	300

Hand-held adjuster (Type)

Type	For VFW41../VFL41..											
	DN40	**DN50**	**DN65**	**DN80**	**DN100**	**DN125**	**DN150**	**DN200**	**DN250**	**DN300**	**DN350**	**DN400**
 **ASK41NF04SP**	■	■	■									
ASK41NF05SP				■	■	■						
ASK41NF07SP							■	■				
 **ASK41NF10SP**									■	■	■	■

Recommended maximum flow velocity:
VFW41../VFL41..: 4.5 m/s for water

Changeover and open/close ball valves

Typical applications	Actuators	Data sheet	Spring return function [s]	2 Nm	5 Nm	7 Nm	10 Nm
– Boiler plants – Chiller plants – Domestic hot water – Heating groups	**GQD..9A** **GSD..9A** **GMA..9E** **GLB..9E** **GDB..9E.**	N4659 N4655 N4658 A6V10636203 A6V10636150					

Operating voltage	**Positioning signal**	**Positioning time [s]**										
		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	–	–		**GDB141.9E**		–		**GLB141.9E**	

PN 40	-10...120°C	DN	G	k_{vs}	Δp_s	Δp_{max}	Δp_s	Δp_{max}	Δp_s	Δp_{max}	Δp_s	Δp_{max}
Data sheet	N4214		[Inch]	[m³/h]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]
	**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	k_{vs}	Δp_{max}	Δp_{max}	Δp_{max}	Δp_{max}
Data sheet	N4214		[Inch]	[m³/h]	[kPa]	[kPa]	[kPa]	[kPa]
	**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	G	k_{vs}	Δp_{max}	Δp_{max}	Δp_{max}	Δp_{max}
Data sheet	N4214		[Inch]	[m³/h]	[kPa]	[kPa]	[kPa]	[kPa]
	**VBG60.15-5 L**	15	G 1B	5	350	350	350	350
	VBG60.20-8 L	20	G 1 ¼B	8	350	350	350	350
	VBG60.25-9 L	25	G 1 ½B	9	350	350	350	350
	VBG60.32-13 L	32	G 2B	13	–	–	350	350
	VBG60.40-25 L	40	G 2 ¼B	25	–	–	350	350
	VBG60.50-37 L	50	G 2 ¾B	37	–	–	350	350

PN 40	-10...120°C	DN	Rp	k_{vs}	Δp_s	Δp_{max}	Δp_s	Δp_{max}	Δp_s	Δp_{max}	Δp_s	Δp_{max}
Data sheet	N4214		[Inch]	[m³/h]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]	[kPa]
	**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 1 ¼	35	–	–	–	–	1000	350	1000	350
	VAI60.40-68	40	Rp 1 ½	68	–	–	–	–	800	350	800	350
	VAI60.50-96	50	Rp 2	96	–	–	–	–	600	350	600	350

PN 40	-10...120°C	DN	Rp	k_{vs}	Δp_{max}	Δp_{max}	Δp_{max}	Δp_{max}
Data sheet	N4214		[Inch]	[m³/h]	[kPa]	[kPa]	[kPa]	[kPa]
	**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 1 ¼	25	–	–	350	350
	VBI60.40-49T	40	Rp 1 ½	49	–	–	350	350
	VBI60.50-73T	50	Rp 2	73	–	–	350	350

PN 40	-10...120°C	DN	Rp	k_{vs}	Δp_{max}	Δp_{max}	Δp_{max}	Δp_{max}
Data sheet	N4214		[Inch]	[m³/h]	[kPa]	[kPa]	[kPa]	[kPa]
	**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 1 ¼	13	–	–	350	350
	VBI60.40-25L	40	Rp 1 ½	25	–	–	350	350
	VBI60.50-37L	50	Rp 2	37	–	–	350	350

Refrigerant valves

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

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	Sleeve	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 [mm]	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

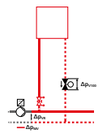
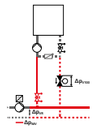
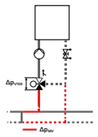
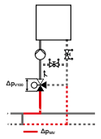
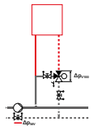
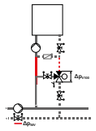
	3-port valve, control path with equal-percentage valve characteristic, bypass with linear valve characteristic.
	3-port valve, control path with equal-percentage valve characteristic, bypass with linear valve characteristic with 70% of the k_{vs} value. This compensates for the flow resistance of the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

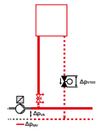
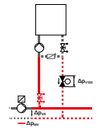
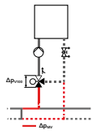
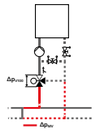
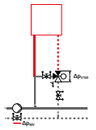
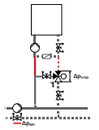
HVAC plants and consumers

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
Ventilation and air conditioning plants						
Air handling unit	■	■	■	–	outdated	outdated
Fan coil unit	■	–	–	–	outdated	outdated
Cooling coil	dehumidifying	■	–	–	uncommon	uncommon
Reheating coil	■	■	uncommon	uncommon	outdated	outdated
Preheating coil	–	■	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	pressureless	pressurized
Volumetric flow	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	Mixing circuit with fixed pre-mixing	Diverting circuit	Injection circuit with 3-port valve
—	For valve sizing relevant variable flow path						

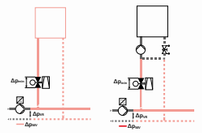
Determine volumetric flow $\dot{V}$

2	**Δp_{VR} or Δp_{MV}**	Δp_{VR}			Δp_{MV}	
	typical range	10...200 kPa	10...200 kPa	3...12[1] kPa	3...12[1] kPa	10...50 kPa	2...5 kPa
	typical value	Use effective Δp_{VR} value		3 kPa	3 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	$\dot{V}_{100} = \frac{\dot{Q}_{100}}{1.163 \cdot \Delta T}$		Water with anti-freeze	$\dot{V}_{100} = \frac{\dot{Q}_{100} \cdot 3600}{c \cdot \rho \cdot \Delta T}$	
5	**Determine k_{vs} value**	$k_V = \dot{V}_{100} \cdot \sqrt{\frac{100\ kPa}{\Delta p_{V100}}}$ => $k_{vs} \geq 0.85 \cdot k_v$ value					
6	**Check resulting Δp_{V100}**	$\Delta p_{V100} = 100\ kPa \cdot \left(\frac{\dot{V}_{100}}{k_{vs}}\right)^2$					

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**	$P_V = \frac{\Delta p_{V100}}{\Delta p_{VR}} = 0.25...0.8$	$P_V = \frac{\Delta p_{V100}}{\Delta p_{V100} + \Delta p_{MV}} = 0.25...0.8$	
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**	Throttling circuit or Injection circuit with 2-port valve (e.g. PICV) 

Determine volumetric flow $\dot{V}$

2	**Determine $\dot{Q}_{100}$**	$\dot{Q}_{100}$			
3	**Determine ΔT**	ΔT			
4	**Calculate $\dot{V}$**	Water	$\dot{V}_{100} = \frac{\dot{Q}_{100}}{1.163 \cdot \Delta T}$	Water with anti-freeze	$\dot{V}_{100} = \frac{\dot{Q}_{100} \cdot 3600}{c \cdot \rho \cdot \Delta T}$

Select valve and actuator

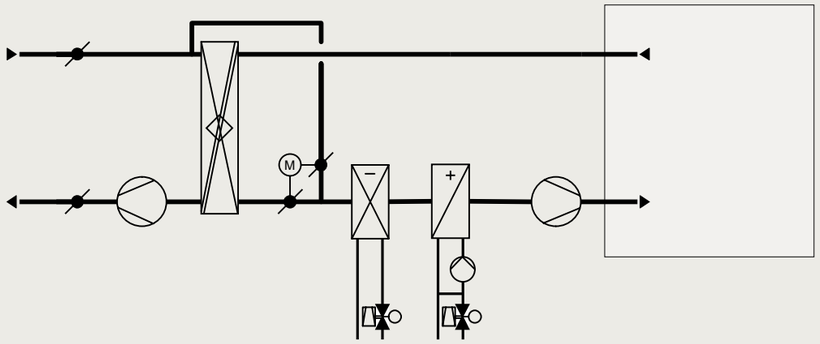
5	**Select suitable valve**	1. Type of valve (with/without P/T plugs) 4. Connection (flanged, threaded)	2. PN class 5. Nominal size DN	3. Max. / min. medium temperature 6. Medium
6	**Determine presetting**	Determine presetting using the volumetric flow/dial table in data sheet of the respective PICV		
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 Siemens slide ruler, the online tool for simple valve sizing, to find the right valve with actuator.

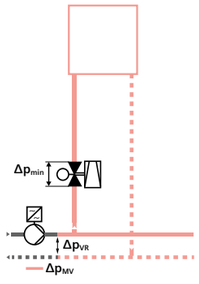
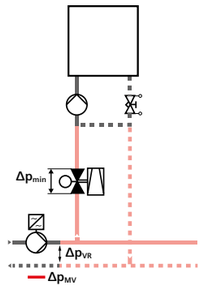
Or just install the Combi Valve (PICV) Sizer on your smartphone to find the right PICV with actuator.

[1] e.g. with heat meter

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

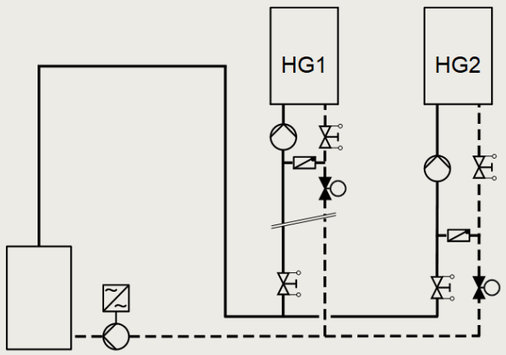


Plant data	Cooling coil	Heating coil
Cooling/heating power $\dot{Q}_{100}$	75 kW	65 kW
Supply temperature producer $\theta_{Producer}$	6 °C	55 °C
Temperatures Supply/Return θ_{Supply} / θ_{Return}	6/12 °C	50/35 °C
Temperature difference	6 K	20 K
Medium	Water	Water
Differential pressure Δp_{MV} no balancing valve required	57 kPa	12 kPa
Shutoff head pump H_0 (resp. Δp_{V0})	18 mWC (180 kPa)	14 mWC (140 kPa)
Positioning signal	0...10 V	0...10 V

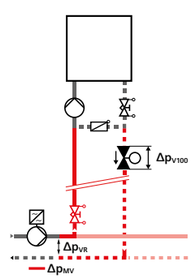
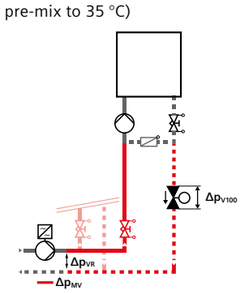
	Cooling coil	Reheating coil
1 Determine Volumetric flow $\dot{V}_{100}$		
$\dot{V}_{100} = \frac{\dot{Q}_{100}}{1.163 \cdot \Delta T}$ decisive temperature difference Constant 1.163: with density ρ = 1000 kg/m³, 3600 s/h and specific heat capacity c = 4.187 kJ/(kg·K)	$\dot{V}_{100} = \frac{75\ kW}{1.163 \cdot 6\ K} = 10.75\ m^3/h$ $\theta_{Return\ cooling\ coil} - \theta_{Producer} = (12 - 6)\ °C = 6\ K$	$\dot{V}_{100} = \frac{65\ kW}{1.163 \cdot 20\ K} = 2.79\ m^3/h$ $\theta_{Producer} - \theta_{Return\ heating\ coil} = (55 - 35)\ °C = 20\ K$
Hydronic circuit Δp_{MV} Differential pressure variable flow path $\Delta p_{VR} = \Delta p_{min} + \Delta p_{MV}$	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 VPF44.50F15	**VPF44.50F15** — **15 m³/h nominal** $\dot{V}$ [m³/h]: 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 **Max** Dial: 3.7 4.2 4.9 5.6 6.3 7.0 7.7 8.4 9.2 10.0 11.0 11.9 12.6 13.2 13.5 13.8 14.1 **14.3** Δp_{min} [kPa]: 13 14 15 16 16 17 18 18 19 20 21 21 22 23 23 24 25 **25**	
Reheating coil VPP46.32F4Q	**VPP46.32F4, VPP46.32F4Q, VPI46.32F4, VPI46.32F4Q** — **4000 l/h nominal** $\dot{V}$ [l/h]: 550 800 910 1110 1320 1520 1720 1930 2130 2330 2530 2740 2940 3140 3350 3550 3750 4001 Dial: 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. Δp_{min} [kPa]: 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	
Δp_{min}	Δp_{min} = 21 kPa	Δp_{min} = 21 kPa
Presetting	Dial = 2.55	Dial = 2.85
Total resistance Δp_{VR} for primary pump	$\Delta p_{VR} = \Delta p_{MV} + \Delta p_{min}$ = 57 kPa + 21 kPa Δp_{VR} = 78 kPa (7.8 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	VPF44.50F15 (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 5.5 mm stroke
Operating voltage	AC 24 V	AC 24 V
Positioning signal	0...10 V	0...10 V
Positioning time	30 s	55 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*	SSA161E.05HF ➞ with equal percentage characteristic *fits well to reheating coil transfer characteristic*
$\Delta p_{max} \geq \Delta p_{V0}$ (H_0)	600 kPa ≥ 180 kPa	600 kPa ≥ 140 kPa
Selection		
PICV	VPF44.50F15 (with measuring points)	VPP46.32F4Q (with measuring points)
Valve actuator	SAX61P03	SSA161E.05HF

Heating plant with pressurized distribution, with k_{VS}-valves (2-port)



Plant data	Heating group 1 (ventilation)	Heating group 2 (floor heating)
Heating group power $\dot{Q}_{100}$	55 kW	60 kW
Supply temperature producer $\theta_{Producer}$	50 °C	50 °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 (ventilation)	Heating group 2 (floor heating)
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)	$\dot{V}_{100} = \frac{55\ kW}{1.163 \cdot 10\ K} = 4.73\ m^3/h$ $\theta_{Supply\ HG\ 1} - \theta_{Return\ HG\ 1} = (50 - 40)\ °C = 10\ K$	$\dot{V}_{100} = \frac{60\ kW}{1.163 \cdot 27\ K} = 1.91\ m^3/h$ $\theta_{Producer} - \theta_{Return\ HG\ 2} = (50 - 28)\ °C = 22\ K$ Pre-mixing to 35 °C is also achieved by correct hydronic balancing with balancing valves.
2 Determine Differential pressure Δp_{V100}		
Hydronic circuit Δp_{MV} Differential pressure across variable flow path $\Delta p_{VR} = \Delta p_{min} + \Delta p_{MV}$ **Note on heating group 1 (ventilation):** in case of long distance to the AHU, timely heating water supply must be ensured.	Injection circuit with 2-port valve 	Injection circuit with 2-port valve (with pre-mix to 35 °C) 
Distribution setup	Pressurized with variable flow rate (primary pump controlled)	
Δp_{VR} typical range	10...200 kPa	10...200 kPa
Δp_{VR} according to planner's specification	ca. 20 kPa (for HG1, ventilation)	18.7 kPa (like $\Delta p_{VR\ HG1}$)
Δp_{V100}	$\Delta p_{V100} \geq \Delta p_{VR}/2$ (resp. $P_V \geq 0.5$)	$\Delta p_{V100} = \Delta p_{VR\ HG1} - \Delta p_{VR\ HG2} = 18.7\ kPA - 5\ kPa$
Desired differential pressure	$\Delta p_{V100} \geq 10\ kPa$	$\Delta p_{V100} \geq 13.7\ kPa$

	Heating group 1 (ventilation)	Heating group 2 (floor heating)
3 Determine desired flow k_V		
$k_V = \dot{V}_{100} \cdot \sqrt{\frac{100\ kPa}{\Delta p_{V100}}}$	$k_V = 4.73\ m^3/h \cdot \sqrt{\frac{100\ kPa}{10\ kPa}} = 15.0\ m^3/h$	$k_V = 2.35\ m^3/h \cdot \sqrt{\frac{100\ kPa}{12.7\ kPa}} = 6.6\ m^3/h$
4 Select valve nominal flow rate k_{VS} and determine resulting differential pressure $\Delta p_{V100\ res}$		
$k_{VS} \geq 0.85 \cdot k_V$-value	$k_{VS} \geq 0.85 \cdot 15.0\ m^3/h = 12.8\ m^3/h$ selected: $k_{VS} = 16\ m^3/h$	$k_{VS} \geq 0.85 \cdot 6.6\ m^3/h = 5.6\ m^3/h$ selected: $k_{VS} = 6.3\ m^3/h$
resulting $\Delta p_{V100\ res}$ $\Delta p_{V100\ res} = 100\ kPa \cdot \left(\frac{\dot{V}_{100}}{k_{VS}}\right)^2$	$\Delta p_{V100\ res} = 100\ kPa \cdot \left(\frac{4.73\ m^3/h}{16\ m^3/h}\right)^2$ $\Delta p_{V100\ res} = 8.7\ kPa$	$\Delta p_{V100\ res} = 100\ kPa \cdot \left(\frac{2.35\ m^3/h}{6.3\ m^3/h}\right)^2$ $\Delta p_{V100\ res} = 13.9\ kPa$
5 Check valve authority P_V (control stability)		
$P_V = \frac{\Delta p_{V100\ res}}{\Delta p_{V100\ res} + \Delta p_{MV}}$ and $0.25 < P_V < 0.8$	$P_V = \frac{8.7\ kPa}{8.7\ kPa + 10\ kPa}$ $P_V = 0.47$ (close to 0.5)	$P_V = \frac{13.9\ kPa}{13.9\ kPa + 5\ kPa}$ $P_V = 0.74$
6 Select suitable valve type		
Type of valve	2-port valve	2-port valve
Connection type	External thread	External thread
Nominal pressure level PN	PN 16	PN 16
Possible valve type(s)	VVG44.., VVG41..	VVG44.., VVG41..
Selected valve	VVG41.32-16 with $k_{VS} = 16\ m^3/h$ piping size DN 32, stroke = 20 mm with equal percentage/linear characteristic	VVG20-6.3 with $k_{VS} = 6.3\ m^3/h$ piping size DN 20, stroke = 5.5 mm with linear characteristic
	Fits well with reheater transfer behavior	Fits well with the flow temperature control
7 Check valve working range		
Medium	VVG41 suitable for water	VVG44 suitable for water
Medium temperature	40 °C > -25 °C min. medium temperature 50 °C < 150 °C max. medium temperature	28 °C > 1 °C min. medium temperature 35 °C < 120 °C max. medium temperature
8 Select actuator	**Controlled by the ventilation control**	**Controlled by the heating control**
Actuator type	SAX.. with 20 mm stroke	SAS.. with 5.5 mm stroke
Operating voltage	AC 24 V	AC 230 V
Positioning signal	0...10 V	3-point (open – 0 – close)
Positioning time	30 s	120 s
Spring return function	No	No
Additional functions	None	None
Selected actuator	SAX61.03	SAS31.00
9 Check actuator working range		
Differential pressure $\Delta p_{max} \geq \Delta p_{V0}$ (H_0)	$\Delta p_{max} = 800\ kPa \geq 18.7\ kPa$	$\Delta p_{max} = 400\ kPa \geq 18.7\ kPa$
Closing pressure $\Delta p_S \geq \Delta p_{V0}$ (H_0)	$\Delta p_S = 875\ kPa \geq 18.7\ kPa$	$\Delta p_S = 750\ kPa \geq 18.7\ kPa$
Selected actuator	SAX61.03 (no spring return/additional functions)	SAS31.00 (no spring return/additional functions)
Selection		
Valve	VVG41.32-16 with $k_{VS} = 16\ m^3/h$	VVG44.20-6.3 with $k_{VS} = 6.3\ m^3/h$
Actuator	SAX61.03	SAS31.00

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