SIEMENS

Ingenuity for life

Install the "Scan to HIT" app and scan the DMC code on the product to get product information.

Valves and actuators: Acvatix hydronics. Everything under control.

Fast and easy planning, installation and commissioning

siemens.com/acvatix

The right solution for every hydronic project

Highlights

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

Acvatix™ is a versatile range of valves and actuators for superior ease of use, maximum control accuracy and energy efficiency. It allows you to meet virtually any control and hydronic requirement associated with the generation, distribution and use of heating and cooling. Siemens provides useful tools and extensive knowledge to assist you in every project phase.

Benefit from our decades of experience

You receive the highest quality and maximum reliability because Acvatix valves and actuators are improved continually based on Siemens' many years of experience in the field and rigorous testing in the in-house HVAC laboratory. The result: Acvatix products have been used for decades in millions of successful installations worldwide.

Selection and engineering made easy

The HIT Portal, the valve slide ruler or the Combi Valve Sizer app allow you to quickly find the right products for your application. You can use the HIT Portal to design the entire HVAC application step by step, including specifications complete with plant diagrams and lists of materials.

Installation in a few simple steps

Acvatix products make your daily work easier, whether it is intuitive manual operation irrespective of the installation position or valve actuator coupling with just one screw or via bayonet mount. Lost the instructions for a product? No problem! Simply use the "Scan to HIT" app from Siemens to scan the data matrix code on the product and receive complete product information.

Intelligent comfort for optimized plant operation

Acvatix offers rapid commissioning and efficient plant control. Easy-to-see operating status and position indicators speed up commissioning, testing and maintenance of the plant and help with troubleshooting. State-of-the-art products such as pressure independent combi valves save time and effort through automatic hydronic balancing. Acvatix is synonymous with robust design, outstanding reliability as well as minimal need for maintenance.

The future of construction

Boost your efficiency by using BIM (Building Information Modeling) for planning. The holistic process that is transforming planning, construction and management of buildings and infrastructures accelerates amongst others construction and early error detection.

siemens.com/bim-data

The Combi Valve Sizer app makes it easy to select the right Acvatix combi valve and actuator. This makes designing energy-efficient HVAC systems easier than ever.

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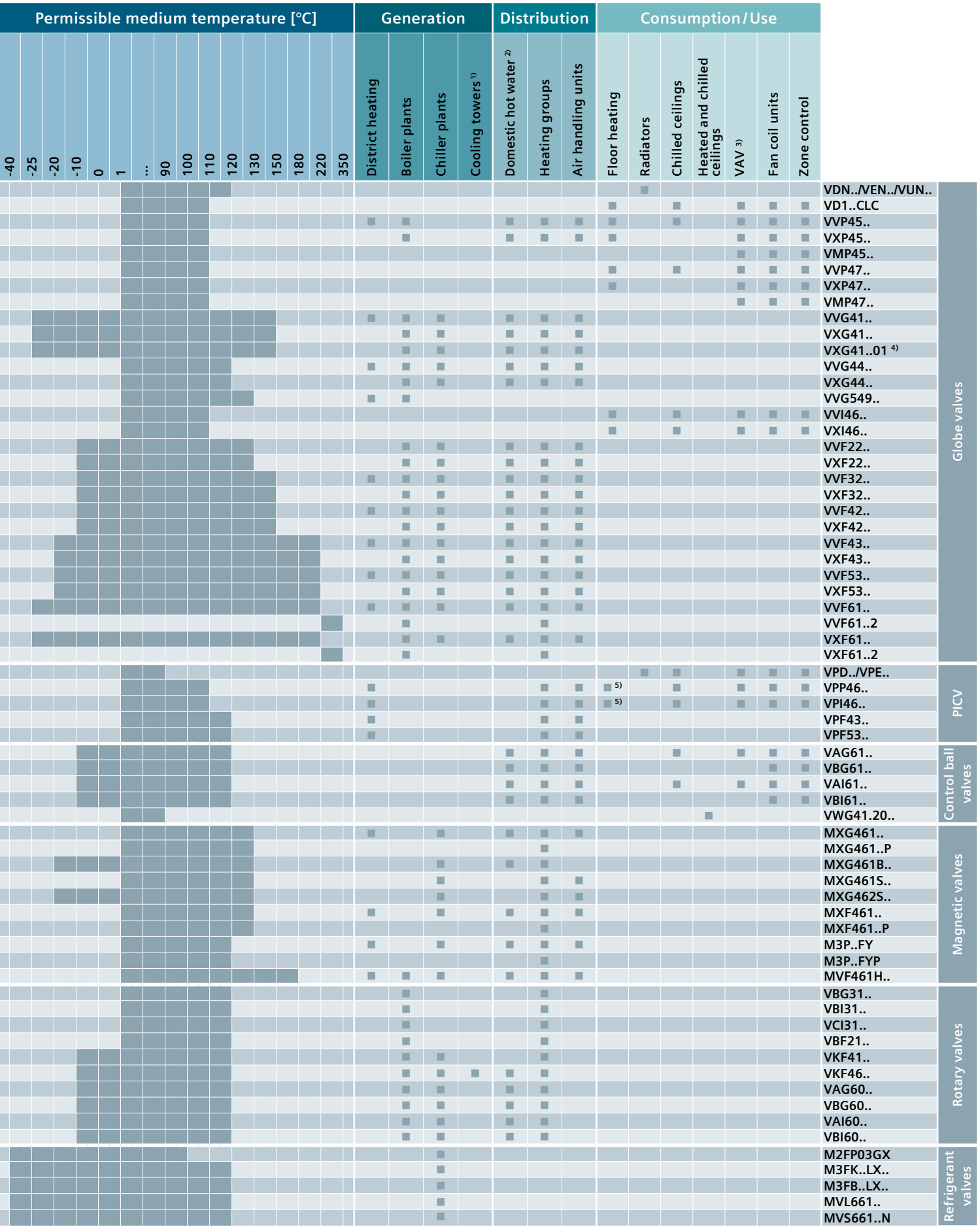
										Recommended media													
		2-port valve	3-port valve	4-port valve	6-port valve	PN class	Type of connection	Silicon-free grease	Closed circuits	Open circuits	Chilled water	Cooling water [1]	Drinking water	Low-temperature hot water	High-temperature hot water	Water glycol mixture	Saturated steam	Superheated steam	Heat transfer oil	Media containing mineral oils	Safety refrigerants	R744 (CO_2)	R717 (ammonia)
Globe valves	VDN../VEN../VUN..	■				10	ET		■		■			■		■							
	VD1..CLC	■				10	ET		■		■			■		■							
	VVP45..	■				16	ET		■		■			■		■							
	VXP45..		■			16	ET		■		■			■		■							
	VMP45..		■			16	ET		■		■			■		■							
	VVP47..	■				16	ET		■		■			■		■							
	VXP47..		■			16	ET		■		■			■		■							
	VMP47..		■			16	ET		■		■			■		■							
	VVG41..	■				16	ET	■	■	■	■	■		■	■	■	■	■					
	VXG41..		■			16	ET	■	■	■	■	■		■	■	■							
	VXG41..01 [4]		■			16	ET	■	■	■	■	■	■	■	■	■							
	VVG44..	■				16	ET	■	■		■			■		■							
	VXG44..		■			16	ET	■	■		■			■		■							
	VVG549..	■				25	ET		■		■	■		■	■	■							
	VVI46..	■				16	IT		■		■			■		■							
	VXI46..		■			16	IT		■		■			■		■							
	VVF22..	■				6	F	■	■		■			■	■	■							
	VXF22..		■			6	F	■	■		■			■	■	■							
	VVF32..	■				10	F	■	■		■			■	■	■							
	VXF32..		■			10	F	■	■		■			■	■	■							
	VVF42..	■				16	F	■	■		■			■	■	■							
	VXF42..		■			16	F	■	■		■			■	■	■							
	VVF43..	■				16	F	■	■	■	■	■		■	■	■	■	■	■				
	VXF43..		■			16	F	■	■	■	■	■		■	■	■			■				
	VVF53..	■				25	F	■	■	■	■	■		■	■	■	■	■	■				
	VXF53..		■			25	F	■	■	■	■	■		■	■	■			■				
	VVF61..	■				40	F		■	■	■	■		■	■	■	■	■	■				
	VVF61..2	■				40	F		■	■	■	■		■	■	■			■				
	VXF61..		■			40	F		■	■	■	■		■	■	■			■				
	VXF61..2		■			40	F		■	■	■	■		■	■	■			■				
PICV	VPD../VPE..	■				10	ET		■		■			■		■							
	VPP46..	■				25	ET		■		■			■		■							
	VPI46..	■				25	IT		■		■			■		■							
	VPF43..	■				16	F	■	■		■			■		■							
	VPF53..	■				25	F	■	■		■			■		■							
Control ball valves	VAG61..	■				40	ET	■	■		■			■	■	■							
	VBG61..		■			40	ET	■	■		■			■	■	■							
	VAI61..	■				40	IT	■	■		■			■	■	■							
	VBI61..		■			40	IT	■	■		■			■	■	■							
	VWG41.20..				■	16	ET/IT	■	■		■			■	■	■							
Magnetic valves	MXG461..	■	■			16	ET		■		■			■		■							
	MXG461..P	■	■			16	ET		■										■	■			
	MXG461B..	■	■			16	ET		■	■	■	■	■	■		■							
	MXG461S..	■	■			16	ET		■	■	■	■		■		■							
	MXG462S..	■	■			16	ET		■	■	■	■		■		■							
	MXF461..	■	■			16	F		■		■			■		■							
	MXF461..P	■	■			16	F		■										■	■			
	M3P..FY	■	■			16	F		■		■			■		■							
	M3P..FYP	■	■			16	F		■										■	■			
	MVF461H..	■				16	F		■		■			■	■	■	■	■					
Rotary valves	VBG31..		■			10	ET		■					■	■								
	VBI31..		■			10	IT		■					■	■								
	VCI31..			■		10	IT		■					■	■								
	VBF21..		■			6	F		■					■	■								
	VKF41..	■				16	F		■		■			■	■	■							
	VKF46..	■				16	F		■	■	■	■		■		■							
	VAG60..	■				40	ET	■	■		■			■	■	■							
	VBG60..		■			40	ET	■	■		■			■	■	■							
	VAI60..	■				40	IT	■	■		■			■	■	■							
	VBI60..		■			40	IT	■	■		■			■	■	■							
Refrigerant valves	M2FP03GX					32	–		■												■		■
	M3FK..LX..		■			32	S		■												■		
	M3FB..LX..		■			PS 43	S		■												■		
	MVL661..	■				PS 45	S		■												■	■	
	MVS661..N	■				PS 53	W		■												■	■	■

Recommendation: water treatment according to VDI 2035

[1] Open circuits; [2] Not for drinking water circuit (open circuit) [3] Variable air volume; [4] Sealed bypass; [5] As zone valve for floor heating systems; IT = internally



threaded connection, ET = externally threaded connection, F = flanged connection, S = soldered connection, W = welded connection

Threaded globe valves

Typical applications	Actuators	Data sheet						
– Radiators	**RTN..**	N2111						
								
						RTN51/RTN51G	**RTN71**	**RTN81**
Typical applications	**Actuators**	**Data sheet**				4.5 mm	2.5 mm	4.5 mm
– Radiators	**STA..** **SSA..**	N4884 N4893				100 N	100 N	90 N
								
	Operating voltage	**Positioning signal**	**Positioning time [s]**					
	AC 230 V	2-position	210			**STA23**	–	**STA23HD** [1]
		3-position	150			–	**SSA31**	–
	AC 24 V	3-position	150			–	**SSA81**	–
		0...10 V	270 [2]			**STA63**	–	–
	AC/DC 24 V	2-position/PDM	270			**STA73**	–	**STA73HD** [1]
		0...10 V	34			–	**SSA61**	–
	Normally Open / Normally Closed (for radiator valves)					**NC**	–	**NC**
PN 10 1...120 °C	DIN	NF		DN	Rp/R [Inch]	k_v [m³/h]	Δp_{max} [kPa]	Δp_{max} [kPa]	Δp_{max} [kPa]
Data sheet	N2105	N2106							
	**VDN110**	**VDN210**		10	Rp/R ⅜	0.09...0.63	60	60	60
	VDN115	**VDN215**		15	Rp/R ½	0.10...0.89	60	60	60
	VDN120	**VDN220**		20	Rp/R ¾	0.31...1.41	60	60	60
	**VEN110**	**VEN210**		10	Rp/R ⅜	0.09...0.63	60	60	60
	VEN115	**VEN215**		15	Rp/R ½	0.10...0.89	60	60	60
	VEN120	**VEN220**		20	Rp/R ¾	0.31...1.41	60	60	60
	–	**VUN210**		10	Rp/R ⅜	0.14...0.60	60	60	60
	–	**VUN215**		15	Rp/R ½	0.13...0.77	60	60	60

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

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

Control range with electromotoric and electrothermic actuators SSA.., STA.. 	■	■	■	■	■	■	–
Control range with thermostatic head RTN.. 	■	■	■	■	■	■	■
Reference numbers for preadjustment	1	2	3	4	5	N	N (k_{vs})
VDN110/VDN210/VEN110/VEN210	0.072	0.17	0.24	0.28	0.37	0.43	0.63
VDN115/VDN215/VEN115/VEN215	0.07	0.17	0.28	0.36	0.45	0.50	0.89
VDN120/VDN220/VEN120/VEN220	0.22	0.35	0.44	0.52	0.60	0.71	1.41
VUN210	0.14	0.26	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				4.5 mm	2.5 mm
– Chilled ceilings	**STA..** **SSA..**	N4884 N4893				100 N	100 N
							
	Operating voltage	**Positioning signal**	**Positioning time [s]**				
	AC 230 V	2-position	210			**STA23**	–
		3-position	150			–	**SSA31**
	AC 24 V	3-position	150			–	**SSA81**
		0...10 V	270 [2]			**STA63**	–
	AC/DC 24 V	2-position/PDM	270			**STA73**	–
		0...10 V	34			–	**SSA61**
	Normally Open / Normally Closed (for radiator valves)					**NC**	–
PN 10 1...110 °C			DN	Rp/R [Inch]	k_v [l/h]	Δp_{max} [kPa]	Δp_{max} [kPa]
Data sheet	N2103						
	**VD115CLC**		15	Rp/R ½	0.25...1.9	150	150
	VD120CLC		20	Rp/R ¾	0.25...2.6	150	150
	VD125CLC		25	Rp/R 1	0.25...2.6	150	150

[1] Optimized for floor heating systems

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

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

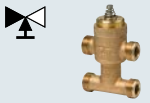
The selected kv values of the radiator valves can be easily and precisely set on the valve head in 5 steps + N (fully open).

Threaded globe valves

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

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

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

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

Union nuts for threaded valves

Union nuts for threaded valves	See page 9

VVP45..N with Serto compression fittings, kvs = 2.5 / 4 / 6.3 m³/h
VVP45..S, VMP45..S with Conex® compression fittings, kvs = 0.63 / 1 / 1.6 / 2.5 m³/h
VVP47..S, VMP47..S with Conex® compression fittings, kvs = 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		4.5 mm	2.5 mm
– Floor heating – Fan coil units – Zone control	**SFA..** **SUA21/1** **STA..** **SSA31.04** [1]	N4863 N4830 N4884 N4860			200 N	150 N	100 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	210	–	–	–	**STA23**	–
		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]	–	–	–	**STA63**	–
	AC/DC 24 V	2-position/PDM	270	–	–	–	**STA73**	–

PN 16	1...110 °C	DN	Rp [Inch]	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	N4842											
	**VVI46.15**	15	Rp ½	2	300	300	300	300	200	200	200	200
	VVI46.20	20	Rp ¾	3.5	300	300	300	300	200	200	200	200
	VVI46.25	25	Rp 1	5	300	300	250	250	200	200	200	200
	**VXI46.15** [4]	15	Rp ½	2	–	300	–	300	–	200	–	200
	VXI46.20 [4]	20	Rp ¾	3.5	–	300	–	300	–	200	–	200
	VXI46.25 [4]	25	Rp 1	5	–	300	–	300	–	200	–	200
	VXI46.25T [5]	25	Rp 1	5	–	200	–	200	–	200	–	200

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

Color		White						Black
Equipped with		–	Function module DC 0...10 V		Auxiliary switch for STA	Auxiliary switch for STP	LED	–
Positioning signal		2-position (On/Off)	DC 0...10 V	DC 0...10 V	2-position (On/Off)	2-position (On/Off)	2-position (On/Off)	2-position (On/Off)
		[STA.., NC]	[STA.., NC]	–	[STA.., NC]	–	[STA.., NC]	[STA.., NC]
		[STP.., NO]	–	[STP.., NO]	–	[STP.., NO]	[STP.., NO]	[STP.., NO]
Standard PVC cables	1 m				**ASA23U10**	**ASP23U10**		
	2 m	**ASY23L20**	**ASY6AL20**	**ASY6PL20**			**ASY23L20LD**	
	3 m							**ASY23L30B**
	5 m	**ASY23L50**						**ASY23L50B**
	10 m	**ASY23L100**						
	15 m	**ASY23L150**						
Halogen-free cables	2 m	**ASY23L20HF**	**ASY6AL20HF**	**ASY6PL20HF**				
	5 m	**ASY23L50HF**						
	10 m	**ASY23L100HF**						
Actuator								
STA73/00		■	■		■		■	
STA23/00		■			■			
STP73/00		■		■		■	■	
STP23/00		■				■		
STA73PR/00 [6]		■			■		■	
STP73PR/00 [6]		■				■	■	
STA73MP/00 [7]		■	■		■		■	
STA23MP/00 [7]		■			■			
STA73B/00								■
STA23B/00								■

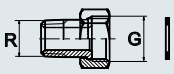
[1] Not suited for radiator valves
[2] SPST = single-pole single-throw, SPDT = single-pole double-throw
[3] In control mode (warm-up time) min. running time approx. 30 s/mm
[4] 70% k_{vs} in bypass, leakage rate in bypass 2...5% of k_{vs} value
[5] 100% k_{vs} in bypass, leakage rate in bypass 0.05% of kvs value. **For noiseless operation, the value of 100 kPa should not be exceeded.**
[6] Actuators ideal for parallel running. Pulse duration modulation (PDM) in connection with Siemens room controllers of the Desigo™ range and room thermostats.
[7] Multipack with 50 actuators (OEM) NC: normally closed, NO: normally open

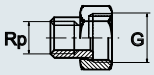
Threaded globe valves

Typical applications	Actuators	Data sheet				Spring return function [s]		20 mm		
– District heating – Boiler plants – Chiller plants – Domestic hot water – Heating groups – Air handling units	SAX.. SKD.. SKB..	N4501 N4561 N4564						800 N 	1000 N 	2800 N 
	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
	AC/DC 24 V	0...10 V, 4...20 mA	30	–	–	–	–	SAX61.03	–	–

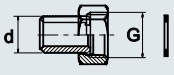
PN 16	-25...150 °C [2]			DN	G [Inch]	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	N4363	N4463										
	VVG41.11..12	–	–	15	G 1B	0.63 / 1	1600	800	1600	800	1600	800
	VVG41.13	–	VXG41.1301	15	G 1B	1.6	1600	800	1600	800	1600	800
	VVG41.14	–	VXG41.1401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

Union nuts for threaded valves [3]





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



Type	G [Inch]	Ø d [mm]	Material
Set of 2			
ALS152	G ¾B	21.3	Steel, weldable
ALS202	G 1B	26.8	Steel, weldable
ALS252	G 1¼B	33.7	Steel, weldable

[1] SAX81..: AC / DC 24 V
[2] SAX.. max. 130 °C
[3] Valve side: cylindrical thread G according to ISO 228-1, pipe side: ALG.. with cylindrical Rp- or tapered R-thread according to ISO 7-1 Pipe side: ALS.. with welded connection

Threaded globe valves

Typical applications	Actuators	Data sheet		Spring return function [s]	5.5 mm		
– Boiler plants – Domestic hot water – Heating groups – Air handling units	**SAS..**	N4581	400 N				
	Operating voltage	**Positioning signal**	**Positioning time [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**

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
– Boiler plants – Heating groups – Air handling units	**SSC..**	N4895			300 N 
	Operating voltage	**Positioning signal**	**Positioning time [s]**	**Spring return function [s]**	
	AC 230 V	3-position	150	–	**SSC31**
	AC 24 V	3-position	150	–	**SSC81**
	AC/DC 24 V	0...10 V	30	–	**SSC61**
		0...10 V	30	30	**SSC61.5**

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

Typical applications	Actuators	Data sheet		Spring return function [s]	5.5 mm	
– District heating – Boiler plants	**SAT..**	N4584	300 N			
	Operating voltage	**Positioning signal**	**Positioning time [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**

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 ¾B	1 / 1.6 / 2.5	2000	1200	2000	1200
	VVG549.20-4K	20	G 1B	5	1600	1200	1600	1200
	VVG549.25-6.3K	25	G 1½B	6.3	1600	1200	1600	1200

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

Flanged globe valves

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

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

Operating voltage	Positioning signal	Positioning time [s]			Spring return function [s]		20 mm				40 mm
		SAX	SKD	SKB/C	SKD	SKB/C	800 N	1000 N	2800 N	2800 N	
AC 230 V	3-position	120	120	120	–	–	**SAX31.00**	**SKD32.50**	**SKB32.50**	**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**	**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**	–	–	–	

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]
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	–	–
VVF22.50-40	**VXF22.50-40**	50	40	350	300	450	300	600	300	–	–
VVF22.65-63	**VXF22.65-63**	65	63	200	150	250	200	600	300	–	–
VVF22.80-100	**VXF22.80-100**	80	100	125	75	175	125	450	300	–	–
VVF22.100-160	**VXF22.100-160**	100	160	–	–	–	–	–	–	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]
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	–	–
VVF32.50-40	**VXF32.50-40**	50	40	350	300	450	400	1000	400	–	–
VVF32.65-63	**VXF32.65-63**	65	63	200	150	250	200	700	400	–	–
VVF32.80-100	**VXF32.80-100**	80	100	125	75	175	125	450	400	–	–
VVF32.100-160	**VXF32.100-160**	100	160	–	–	–	–	–	–	300	250
VVF32.125-250	**VXF32.125-250**	125	250	–	–	–	–	–	–	190	160
VVF32.150-400	**VXF32.150-400**	150	400	–	–	–	–	–	–	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]
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	–	–
VVF42.50-..	**VXF42.50-..**	50	31.5 / 40	350	300	450	400	1200	400	–	–
VVF42.65-..	**VXF42.65-..**	65	50 / 63	200	150	250	200	700	400	–	–
VVF42.80-..	**VXF42.80-..**	80	80 / 100	125	75	175	125	450	400	–	–
VVF42.100-..	**VXF42.100-..**	100	125 / 160	–	–	–	–	–	–	300	250
VVF42.125-..	**VXF42.125-..**	125	200 / 250	–	–	–	–	–	–	190	160
VVF42.150-..	**VXF42.150-..**	150	315 / 400	–	–	–	–	–	–	125	100
VVF42.50-40K	–	50	40	1600	400	1600	400	1600	400	–	–
VVF42.65-63K	–	65	63	1600	400	1600	400	1600	400	–	–
VVF42.80-100K	–	80	100	1600	400	1600	400	1600	400	–	–
VVF42.100-160K	–	100	160	–	–	–	–	–	–	1600	400
VVF42.125-250K	–	125	250	–	–	–	–	–	–	1600	400
VVF42.150-360K	–	150	360	–	–	–	–	–	–	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]
Data sheet	N4404	N4404										
VVF43.65-50	–	65	50	–	–	–	–	–	–	700	650
VVF43.65-63	**VXF43.65-63**	65	63	–	–	–	–	–	–	700	650
VVF43.80-80	–	80	80	–	–	–	–	–	–	450	400
VVF43.80-100	**VXF43.80-100**	80	100	–	–	–	–	–	–	450	400
VVF43.100-125	–	100	125	–	–	–	–	–	–	300	250
VVF43.100-160	**VXF43.100-160**	100	160	–	–	–	–	–	–	300	250
VVF43.125-200	–	125	200	–	–	–	–	–	–	190	160
VVF43.125-250	**VXF43.125-250**	125	250	–	–	–	–	–	–	190	160
VVF43.150-315	–	150	315	–	–	–	–	–	–	125	100
VVF43.150-400	**VXF43.150-400**	150	400	–	–	–	–	–	–	125	100
VVF43.65-63K	–	65	63	–	–	–	–	–	–	1600	800
VVF43.80-100K	–	80	100	–	–	–	–	–	–	1600	800
VVF43.100-150K	–	100	150	–	–	–	–	–	–	1600	800
VVF43.125-220K	–	125	220	–	–	–	–	–	–	1600	800
VVF43.150-315K	–	150	315	–	–	–	–	–	–	1600	800
VVF43.200-450K	–	200	450	–	–	–	–	–	–	1200	800
VVF43.250-630K	–	250	630	–	–	–	–	–	–	1000	800

[1] SAX81..: AC/DC 24 V
[2] .. = insert k_{vs} value
[3] SAX.. max. 130 °C; VVF43.., VXF43..: For DN 15...50 and k_{vs} values ≤ 40 m³/h see V..F53..

Flanged globe valves

Typical applications	Actuators	Data sheet					Spring return function [s]		20 mm			40 mm
– District heating – Boiler plants – Chiller plants – Domestic hot water – Heating groups – Air handling units	**SAX..** **SKD..** **SKB..** **SKC..**	N4501 N4561 N4564 N4566							800 N	1000 N	2800 N	2800 N
	Operating voltage	**Positioning signal**	**Positioning time [s]**									
			SAX	SKD	SKB/C	SKD	SKB/C					
	AC 230 V	3-position	120	120	120	–	–		**SAX31.00**	**SKD32.50**	**SKB32.50**	**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**	**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**	**–**	**–**	**–**

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]
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	–	–
	VVF53.50-31.5	–	50	31.5	350	300	450	400	1200	1150	–	–
	VVF53.50-40	**VXF53.50-40**	50	40	350	300	450	400	1200	1150	–	–
	VVF53.65-63	**VXF53.65-63**	65	63	–	–	–	–	–	–	700	650
	VVF53.80-100	**VXF53.80-100**	80	100	–	–	–	–	–	–	450	400
	VVF53.100-160	**VXF53.100-160**	100	160	–	–	–	–	–	–	300	250
	VVF53.125-250	**VXF53.125-250**	125	250	–	–	–	–	–	–	190	160
	VVF53.150-400	**VXF53.150-400**	150	400	–	–	–	–	–	–	125	100
	VVF53.50-40K	–	50	36	–	–	2500	1250	2500	1250	–	–
	VVF53.65-63K	–	65	63	–	–	–	–	–	–	2500	1250
	VVF53.80-100K	–	80	100	–	–	–	–	–	–	2500	1250
	VVF53.100-150K	–	100	150	–	–	–	–	–	–	2500	1250
	VVF53.125-220K	–	125	220	–	–	–	–	–	–	2500	1250
	VVF53.150-315K	–	150	315	–	–	–	–	–	–	2500	1250
	VVF53.200-450K	–	200	450	–	–	–	–	–	–	1200	800
	VVF53.250-630K	–	250	630	–	–	–	–	–	–	1200	800

PN 40	-25...220 °C (350 °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]
Data sheet	N4382	N4482										
	VVF61.09..11 [4]	–	15	0.19 / 0.3 / 0.45	–	–	4000	1600	4000	1600	–	–
	VVF61.12..13 [4]	–	15	0.7 / 1.2	–	–	4000	1600	4000	1600	–	–
	VVF61.14..15 [4]	**VXF61.14..15** [4]	15	1.9 / 3	–	–	4000 –	1600 1200	4000 –	1600 1600	–	–
	VVF61.23..25 [4]	**VXF61.24..25** [4]	25	3 / 5 / 7.5 5 / 7.5	–	–	2250 –	1600 1200	4000 –	1600 1600		
	VVF61.39..40 [4]	**VXF61.39..40** [4]	40	12 / 19	–	–	–	–	4000 –	1600 1200	–	–
	VVF61.49..50 [4]	**VXF61.49..50** [4]	50	19 / 31	–	–	–	–	4000 –	1600 1000	–	–
	VVF61.65	**VXF61.65**	65	49	–	–	–	–	–	–	4000 –	1000 800
	VVF61.80	**VXF61.80**	80	78	–	–	–	–	–	–	4000 –	700 500
	VVF61.90	**VXF61.90**	100	124	–	–	–	–	–	–	4000 –	450 300
	VVF61.91	**VXF61.91**	125	200	–	–	–	–	–	–	4000 –	300 200
	VVF61.92	**VXF61.92**	150	300	–	–	–	–	–	–	4000 –	200 125

[1] SAX81..: AC/DC 24 V
[2] SAX.. max. 130 °C
[3] .. = insert k_{vs} value
[4] For 09...15, 14...15, 23...25, 24...25, 39...40, 49...50 = insert number in place of k_{vs} value

Threaded combi valves

Typical applications	Actuators	Data sheet			4.5 mm	2.5 mm
– Radiators – Chilled ceilings – Fan coil units	**RTN..** **STA..** **SSA..**	N2111 N4884 N4893			100 N	100 N
	Operating voltage	**Positioning signal**	**Positioning time [s]**			
	AC 230 V	2-position	210		–	**STA23**	–
		3-position	150		–	–	**SSA31**
	AC 24 V	3-position	150		–	–	**SSA81**
		0...10 V	270 [1]		–	**STA63**	–
	AC/DC 24 V	2-position / PDM	270		–	**STA73**	–
		0...10 V	34		–	–	**SSA61**
					RTN51	–	–
					RTN71	–	–
					RTN81	–	–

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

Typical applications	Actuators	Data sheet				4.5 mm	2.5 / 5 mm	15 mm
– Heating groups – Air handling units – Chilled ceilings – VAV – Fan coil units – Zone control	**STA..** **SSA..** **SAY..P..**	N4884 N4893 A6V10628469				100 N	100 N	200 N
	Operating voltage	**Positioning signal**	**Positioning time [s]**					
			STA	SSA	SAY			
	AC 230 V	3-position	–	150/300	30	–	**SSA31**	**SAY31P03**
		2-position	210	–	–	**STA23**	–	–
	AC 24 V	0...10 V	270 [1]	–	–	**STA63**	–	–
	AC/DC 24 V	3-position	–	150/300	30	–	**SSA81**	**SAY81P03**
		2-position/PDM	270	–	–	**STA73**	–	–
		0...10 V	–	34/70	30	–	**SSA61/SSA61EP**	**SAY61P03**

PN 25 1...120 °C	Without pressure testing points	With pressure testing points	DN	G [Inch]	V_{min} [l/h]	V_{100} [l/h]	Δp_{min} [kPa]	Δp_{max} [kPa]	Δp_{min} [kPa]	Δp_{max} [kPa]	Δp_{min} [kPa]	Δp_{max} [kPa]
Data sheet	N4855											
	VPP46.10L0.2	**VPP46.10L0.2Q**	10	½	30	200	16	600	16	600	–	–
	VPP46.15L0.2	**VPP46.15L0.2Q**	15	¾	30	200	16	600	16	600	–	–
	VPP46.15L0.6	**VPP46.15L0.6Q**	15	¾	100	575	19	600	19	600	–	–
	VPP46.20F1.4	**VPP46.20F1.4Q**	20	1	200	1190	21	600	–	–	–	–
			20	1	220	1330	–	–	22	600	–	–
	VPP46.25F1.8	**VPP46.25F1.8Q**	25	1 ¼	204	1470	39	600	–	–	–	–
			25	1 ¼	250	1800	–	–	39	600	–	–
	VPP46.32F4	**VPP46.32F4Q**	32	1 ½	450	3270	24	600	–	–	–	–
			32	1 ½	550	4001	–	–	28	600	–	–

PN 25 1...120 °C	Without pressure testing points	With pressure testing points	DN	Rp [Inch]	V_{min} [l/h]	V_{100} [l/h]	Δp_{min} [kPa]	Δp_{max} [kPa]	Δp_{min} [kPa]	Δp_{max} [kPa]	Δp_{min} [kPa]	Δp_{max} [kPa]
Data sheet	N4855											
	VPI46.15L0.2	**VPI46.15L0.2Q**	15	½	30	200	16	600	16	600	–	–
	VPI46.15L0.6	**VPI46.15L0.6Q**	15	½	100	575	19	600	19	600	–	–
	VPI46.20F1.4	**VPI46.20F1.4Q**	20	¾	200	1190	21	600	–	–	–	–
			20	¾	220	1330	–	–	22	600	–	–
	VPI46.25F1.8	**VPI46.25F1.8Q**	25	1 ¼	204	1470	39	600	–	–	–	–
			25	1 ¼	250	1800	–	–	39	600	–	–
	VPI46.32F4	**VPI46.32F4Q**	32	1 ½	450	3270	24	600	–	–	–	–
			32	1 ½	550	4001	–	–	28	600	–	–
	–	**VPI46.40F9.5Q**	40	1 ½	1370	9500	–	–	–	–	25	600
	–	**VPI46.50F12Q**	50	2	1400	11500	–	–	–	–	36	600

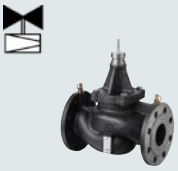
[1] In control mode (warm-up time) min. running time approx. 30 s/mm

[2] .. = insert V_{nom}

V_{nom} = factory setting = volumetric flow at 0.5 mm stroke or setting mark 3 of the presetting; [3] Δp_{min} is valid for V_{Nom} 45/90/145 l/h

Flanged combi valves

Typical applications	Actuators	Data sheet					20 mm	20 / 40 mm	40 mm
– District heating – Heating groups – Air handling units	**SAX..P..** **SQV91P..** **SAV..P..**	N4509 N4833 N4510					500 N	1100 N	1100 N
	Operating voltage	**Positioning signal**	**Positioning time [s]** SAX	SQV	SAV	**Spring return function [s]**			
	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]	**–**

PN 16	1...120 °C	DN	V_{min} [m³/h]	V_{100} [m³/h]	Δp_{min} [kPa]	$\Delta p_s/\Delta p_{max}$ [kPa]	$\Delta p_s/\Delta p_{max}$ [kPa]	$\Delta p_s/\Delta p_{max}$ [kPa]
Data sheet	N4315							
	**VPF43.50F16**	50	2.3	15	35	600	600	–
	VPF43.50F25	50	4.3	25	70	600	600	–
	VPF43.65F24	65	4.4	24	35	600	600	–
	VPF43.65F35	65	6	35	70	600	600	–
	VPF43.80F35	80	5.3	34	35	600	600	–
	VPF43.80F45	80	7	43	70	600	600	–
	VPF43.100F70	100	12.1	68	35	–	600	600
	VPF43.100F90	100	14.8	90	75	–	600	600
	VPF43.125F110	125	18.5	110	35	–	600	600
	VPF43.125F135	125	23	135	53	–	600	600
	VPF43.150F160	150	25,6	148	35	–	600	600
	VPF43.150F200	150	32	195	65	–	600	600

PN 25	1...120 °C	DN	V_{min} [m³/h]	V_{100} [m³/h]	Δp_{min} [kPa]	$\Delta p_s/\Delta p_{max}$ [kPa]	$\Delta p_s/\Delta p_{max}$ [kPa]	$\Delta p_s/\Delta p_{max}$ [kPa]
Data sheet	N4316							
	**VPF53.50F16**	50	2.3	15	35	600	600	–
	VPF53.50F25	50	4.3	25	70	600	600	–
	VPF53.65F24	65	4.4	24	35	600	600	–
	VPF53.65F35	65	6	35	70	600	600	–
	VPF53.80F35	80	5.3	34	35	600	600	–
	VPF53.80F45	80	7	43	70	600	600	–
	VPF53.100F70	100	12.1	68	35	–	600	600
	VPF53.100F90	100	14.8	90	75	–	600	600
	VPF53.125F110	125	18.5	110	35	–	600	600
	VPF53.125F135	125	23	135	53	–	600	600
	VPF53.150F160	150	25.6	148	35	–	600	600
	VPF53.150F200	150	32	195	65	–	600	600

[1] Fail-safe function: valve closed
[2] Fail-safe function: valve open

Control ball valves

Typical applications	Actuators	Data sheet					Spring return function [s]	2 Nm	5 Nm	7 Nm	10 Nm
– Domestic hot water – Heating groups – Air handling units – Chilled ceilings – VAV – Fan coil units – Zone control	**GQD..9A**	N4659									
	GDB..9E	N4657									
	GMA..9E	N4658									
	GLB..9E	N4657									
	Operating voltage	**Positioning signal**	**Positioning time [s]**								
			GQD	GDB	GMA	GLB					
	AC 230 V	3-position	–	150	–	–	–	–	**GDB331.9E**	–	–
	AC 24 V	3-position	–	150	–	–	–	–	**GDB131.9E**	–	–
		0...10 V	–	150	–	–	–	–	**GDB161.9E**	–	–
	AC 100...240 V	(2)/3-position	–	–	–	150	–	–	–	–	**GLB341.9E**
	AC/DC 24 V	(2)/3-position	–	–	–	150	–	–	–	–	**GLB141.9E**
		0...10 V	–	–	–	150	–	–	–	–	**GLB161.9E**
		3-position	30	–	90	–	15	**GQD131.9A**	–	**GMA131.9E**	–
		0...10 V	30	–	90	–	15	**GQD161.9A**	–	**GMA161.9E**	–

PN 40	-10...120 °C		DN	G [Inch]	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	N4211	N4211											
	VAG61.15-..[1]	**VBG61.15-..**	15	G 1B	1.6 / 2.5 / 4 / 6.3	1400	350	1400	350	1400	350	1400	350
	VAG61.15-..	–	15	G 1B	1	1400	350	1400	350	1400	350	1400	350
	VAG61.20-..	**VBG61.20-..**	20	G 1¼B	4 / 6.3	1400	350	1400	350	1400	350	1400	350
	VAG61.20-10	–	20	G 1¼B	10	1400	350	1400	350	1400	350	1400	350
	VAG61.25-10	**VBG61.25-10**	25	G 1½B	10	1400	350	1400	350	1400	350	1400	350
	VAG61.25-..	–	25	G 1½B	6.3 / 16	1400	350	1400	350	1400	350	1400	350
	VAG61.32-10	–	32	G 2B	10	–	–	–	–	1000	350	1000	350
	VAG61.32-16	**VBG61.32-16**	32	G 2B	16	–	–	–	–	1000	350	1000	350
	VAG61.32-25	–	32	G 2B	25	–	–	–	–	1000	350	1000	350
	VAG61.40-16	–	40	G 2¼B	16	–	–	–	–	800	350	800	350
	VAG61.40-25	**VBG61.40-25**	40	G 2¼B	25	–	–	–	–	800	350	800	350
	VAG61.40-40	–	40	G ¼B	40	–	–	–	–	800	350	800	350
	VAG61.50-25	–	50	G 2¾B	25	–	–	–	–	600	350	600	350
	VAG61.50-40	**VBG61.50-40**	50	G 2¾B	40	–	–	–	–	600	350	600	350
	VAG61.50-63	–	50	G 2¾B	63	–	–	–	–	600	350	600	350

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

6-port control ball valves

Typical applications	Actuators	Data sheet		5 Nm	5 Nm
– Heated and chilled ceilings	**GDB161.9E**	A6V10636150			
	GDB111.9E/KN	A6V10301232			
	Operating voltage	**Positioning signal**	**Positioning time [s]**		
	AC/DC 24 V	DC 0/2...10 V	150	**GDB161.9E**	–
		KNX-TP	150	–	**GDB111.9E/KN**

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

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

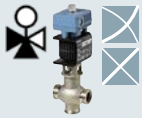
Fittings for 6-port control ball valves

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

Magnetic valves

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

PN 16	1...130 °C	DN	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	**Note**
Data sheet	N4455					
	**MXF461.15-..** [2]	15	0.6 / 1.5 / 3	300	300	To be used as 2-port or mixing valves, not as diverting valves. Selectable valve characteristic: equal-percentage or linear.
	MXF461.20-5.0	20	5	300	300	
	MXF461.25-8.0	25	8	300	300	
	MXF461.32-12	32	12	300	300	
	MXF461.40-20	40	20	300	300	
	MXF461.50-30	50	30	300	300	
	MXF461.65-50	65	50	300	300	
	1...120 °C					
	N4454					
	M3P80FY	80	80	300	300	
	M3P100FY	100	130	200	200	
PN 16	1...180 °C	DN	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	
Data sheet	N4361					
	**MVF461H15-..** [2]	15	0.6 / 1.5 / 3	1000	1000	
	MVF461H20-5	20	5	1000	1000	
	MVF461H25-8	25	8	1000	1000	
	MVF461H32-12	32	12	1000	1000	
	MVF461H40-20	40	20	1000	1000	
	MVF461H50-30	50	30	1000	1000	
PN 16	1...130 °C	DN	G [Inch]	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	N4455					
	**MXG461.15-..** [2]	15	G 1B	0.6 / 1.5 / 3	300	300
	MXG461.20-5.0	20	G 1¼B	5	300	300
	MXG461.25-8.0	25	G 1½B	8	300	300
	MXG461.32-12	32	G 2B	12	300	300
	MXG461.40-20	40	G 2¼B	20	300	300
	MXG461.50-30	50	G 2¾B	30	300	300
PN 16	-20...130 °C	DN	G [Inch]	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]
Data sheet	N4461					
	**MXG461B15-..** [2]	15	G 1B	0.6 / 1.5 / 3	1000	1000
	MXG461B20-5	20	G 1¼B	5	800	800
	MXG461B25-8	25	G 1½B	8	700	700
	MXG461B32-12	32	G 2B	12	600	600
	MXG461B40-20	40	G 2¼B	20	600	600
	MXG461B50-30	50	G 2¾B	30	600	600

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

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

Slipper valves

Typical applications	Actuators	Data sheet				5 Nm	5 Nm	10 Nm
– Boiler plants – Heating groups	**SQK34../84..** **SQK33..** **SAL..**	N4508 N4506 N4502						
	Operating voltage	**Positioning signal**	**Positioning time [s]**					
			SQK	SQK33	SAL			
	AC 230 V	3-position	135	125	120	**SQK34.00**	**SQK33.00**	**SAL31.00T10**
		3-position	–	–	30	**–**	**–**	**SAL31.03T10**
	AC 24 V	3-position	135	–	–	**SQK84.00**	**–**	**–**
	AC/DC 24 V	3-position	–	–	120	**–**	**–**	**SAL81.00T10**
		3-position	–	–	30	**–**	**–**	**SAL81.03T10**
		0...10 V, 4...20 mA	–	–	120	**–**	**–**	**SAL61.00T10**
		0...10 V, 4...20 mA	–	–	30	**–**	**–**	**SAL61.03T10**
	Mounting set					**direct**	**ASK32**	**ASK31N**

PN 6	1...120 °C	DN		k_{vs} [m³/h]	Δp_{max} [kPa]	Δp_{max} [kPa]	Δp_{max} [kPa]
Data sheet	N4241						
	**VBF21.40**	40		25	30	30	–
	VBF21.50	50		40	30	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

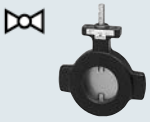
PN 10	1...120 °C	DN	G [Inch]	k_{vs} [m³/h]	Δp_{max} [kPa]	Δp_{max} [kPa]	Δp_{max} [kPa]
Data sheet	N4233						
	**VBG31.20**	20	G 1¼B	6.3	30	30	–
	VBG31.25	25	G 1½B	10	30	30	–
	VBG31.32	32	G 2B	16	30	30	–
	VBG31.40	40	G 2¼B	25	30	30	–

PN 10	1...120 °C	DN	Rp [Inch]	k_{vs} [m³/h]	Δp_{max} [kPa]	Δp_{max} [kPa]	Δp_{max} [kPa]
Data sheet	N4232						
	**VBI31.20**	20	Rp ¾	6.3	30	30	–
	VBI31.25	25	Rp 1	10	30	30	–
	VBI31.32	32	Rp 1¼	16	30	30	–
	VBI31.40	40	Rp 1½	25	30	30	–

PN 10	1...120 °C	DN	Rp [Inch]	k_{vs} [m³/h]	Δp_{max} [kPa]	Δp_{max} [kPa]	Δp_{max} [kPa]
Data sheet	N4252						
	**VCI31.20**	20	Rp ¾	6.3	30	30	–
	VCI31.25	25	Rp 1	10	30	30	–
	VCI31.32	32	Rp 1¼	16	30	30	–
	VCI31.40	40	Rp 1½	25	30	30	–

Butterfly valves

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

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

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

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

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

Recommended maximum flow velocity:

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

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

Changeover and open/close ball valves

Typical applications
– Boiler plants
– Chiller plants
– Domestic hot water
– Heating groups

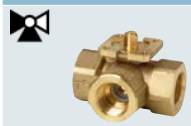
Actuators	Data sheet
GSD..9A	N4655
GQD..9A	N4659
GMA..9E	N4658
GLB..9E	N4657

Operating voltage	Positioning signal	Positioning time [s] GSD	GLB	GQD	GMA	Spring return function [s]	2 Nm	7 Nm	10 Nm
AC/DC 24 V	2-position	30	–	–	–	–	**GSD141.9A**	–	–
AC 230 V	2-position	30	–	–	–	–	**GSD341.9A**	–	–
AC 100...240 V	(2)/3-position	–	150	–	–	–	–	–	**GLB341.9E**
AC/DC 24 V	(2)/3-position	–	150	–	–	–	–	–	**GLB141.9E**
AC/DC 24 V	2-position	–	–	30 (15)	–	✓	**GQD121.9A**	–	–
AC 230 V	2-position	–	–	30 (15)	–	✓	**GQD321.9A**	–	–
AC/DC 24 V	2-position	–	–	–	90 (15)	✓	–	**GMA121.9E**	–
AC 230 V	2-position	–	–	–	90 (15)	✓	–	**GMA321.9E**	–

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

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

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

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

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

Refrigerant valves

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

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

PS 45	-40...120 °C	DN	Connection	Inner Ø [Inch]	k_{vs} [m³/h]	k_{vs} reduced [m³/h]	Δp_{max} [kPa]
Data sheet	N4714						
	**MVL661.15-0.4**	15	Sleeve	⅝	0.4	0.25	2500
	MVL661.15-1.0	15	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

PS 53	-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	22.4	33.7	0.16	0.1	2500
	MVS661.25-0.4N	25	Weldable	22.4	33.7	0.4	0.25	2500
	MVS661.25-1.0N	25	Weldable	22.4	33.7	1	0.63	2500
	MVS661.25-2.5N	25	Weldable	22.4	33.7	2.5	1.6	2500
	MVS661.25-6.3N	25	Weldable	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

Definitions

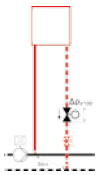
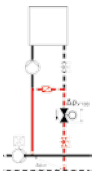
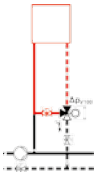
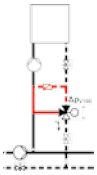
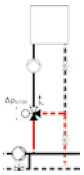
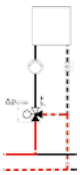
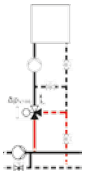
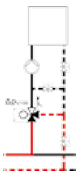
Abbr.	Term	Unit	Definition
Δp	Differential pressure	kPa	Pressure differential between plant sections.
Δp_{max}	Maximum differential pressure	kPa	Maximum permissible differential pressure across the valve's control path (when mixing), valid for the entire actuating range of the motorized valve.
Δp_{maxV}	Maximum differential pressure	kPa	Maximum permissible differential pressure across the valve's control path (when distributing), valid for the entire actuating range of the motorized valve.
Δp_{min}	Minimum differential pressure	kPa	Minimum differential pressure required, so that the differential pressure regulator works reliably with combi valves. Δp_{min} depends on presetting position, see data sheet for details.
Δp_{V0}		kPa	Maximum differential pressure across the valve's closed control path.
Δp_{V100}	Differential pressure at nominal flow rate	kPa	Differential pressure across the fully open valve and the valve's control path by a volumetric flow 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.
kPa	Unit of pressure	kPa	100 kPa = 1 bar = 10 mWC
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 (H100) 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.
Phs	Phase cut control signal	V	DC 0...20 V Phs
P_v	Valve authority		Ratio of differential pressure across fully open valve (H100) and differential pressure across valve and variable flow path. To ensure correct control, a minimum valve authority of 0.25 is required.
Q_{100}	Rated capacity	kW	Plant's design capacity.
V_{100}	Volumetric flow	m³/h	Volumetric flow with valve fully open (H_{100}).
V_{min}	Minimum volumetric flow	m³/h	Smallest presettable volumetric flow through the fully open combi valve (H_{100}).
ν	Kinematic viscosity	mm²/s	In the case of kinematic viscosities ν up to 10 mm²/s, no corrections are required. For the selection of actuating devices for kinematic viscosities ν above 10 mm²/s, please contact your local Siemens branch office.
c	Specific heat capacity	kJ/kgK	
ρ	Specific density	kg/m³	

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

Valve sizing and actuator selection

Basic hydronic circuit

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

HVAC plants and consumers

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

Header

Differential pressure header	pressurized				pressureless			
Volumetric flow	variable		constant		variable			

Determination of k_{VS} value

2	**Δp_{VR} or Δp_{MV}**	Δp_{VR}		Δp_{MV}					
	typical range	10...200 kPa	10...200 kPa	10...50 kPa	2...5 kPa	2...5 kPa	5...15 kPa	2...5 kPa	5...15 kPa
	typical value	Use effective Δp_{VR} value		35 kPa	3 kPa	3 kPa	8 kPa	3 kPa	8 kPa
3	**Determine Δp_{V100}**	$\Delta p_{V100} \geq \frac{\Delta p_{VR}}{2}$		$\Delta p_{V100} > \Delta p_{MV}$					
4	**Calculate V_{100}**	Water without anti-freeze $V_{100} = \frac{Q_{100}}{1.163 \cdot \Delta T}$				Water with anti-freeze $V_{100} = \frac{Q_{100} \cdot 3600}{c \cdot \rho \cdot \Delta T}$			
5	**Determine k_{VS} value**	$k_V = \frac{V_{100}}{\sqrt{\frac{\Delta p_{V100}}{100}}}$ => $k_{VS} \geq 0.85 \cdot k_V$ value							
6	**Check resulting Δp_{V100}**	$\Delta p_{V100} = 100 \cdot \left(\frac{V_{100}}{k_{VS}}\right)^2$							

Selection of valve and actuator				
7	**Select suitable valve series**	a) Type of valve (2-port, 3-port, 3-port with bypass) b) Connections (flanged, threaded, soldered)	c) PN class d) Nominal size DN	e) Max. / min. medium temperature f) Medium
8	**Check valve authority P_V** (control stability)	$P_V = \frac{\Delta p_{V100}}{\Delta p_{VR}} \geq 0.25...0.8$	$P_V = \frac{\Delta p_{V100}}{\Delta p_{V100} + \Delta p_{MV}} \geq 0.25...0.8$	
9	**Select actuator**	a) Operating voltage b) Positioning signal c) Positioning time d) Spring return function e) Auxiliary functions		
10	**Check working range**	a) Differential pressure $\Delta p_{max} > \Delta p_{V0}$ b) Closing pressure $\Delta p_s > H_0$		
11	**Selection**	Valve and suitable actuator		

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

Our world is undergoing changes that force us to think in new ways: demographic change, urbanization, global warming and resource shortages. Maximum efficiency has top priority – and not only where energy is concerned. In addition, we need to increase comfort for the well-being of users. Also, our need for safety and security is constantly growing. For our customers, success is defined by how well they manage these challenges. Siemens has the answers.

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