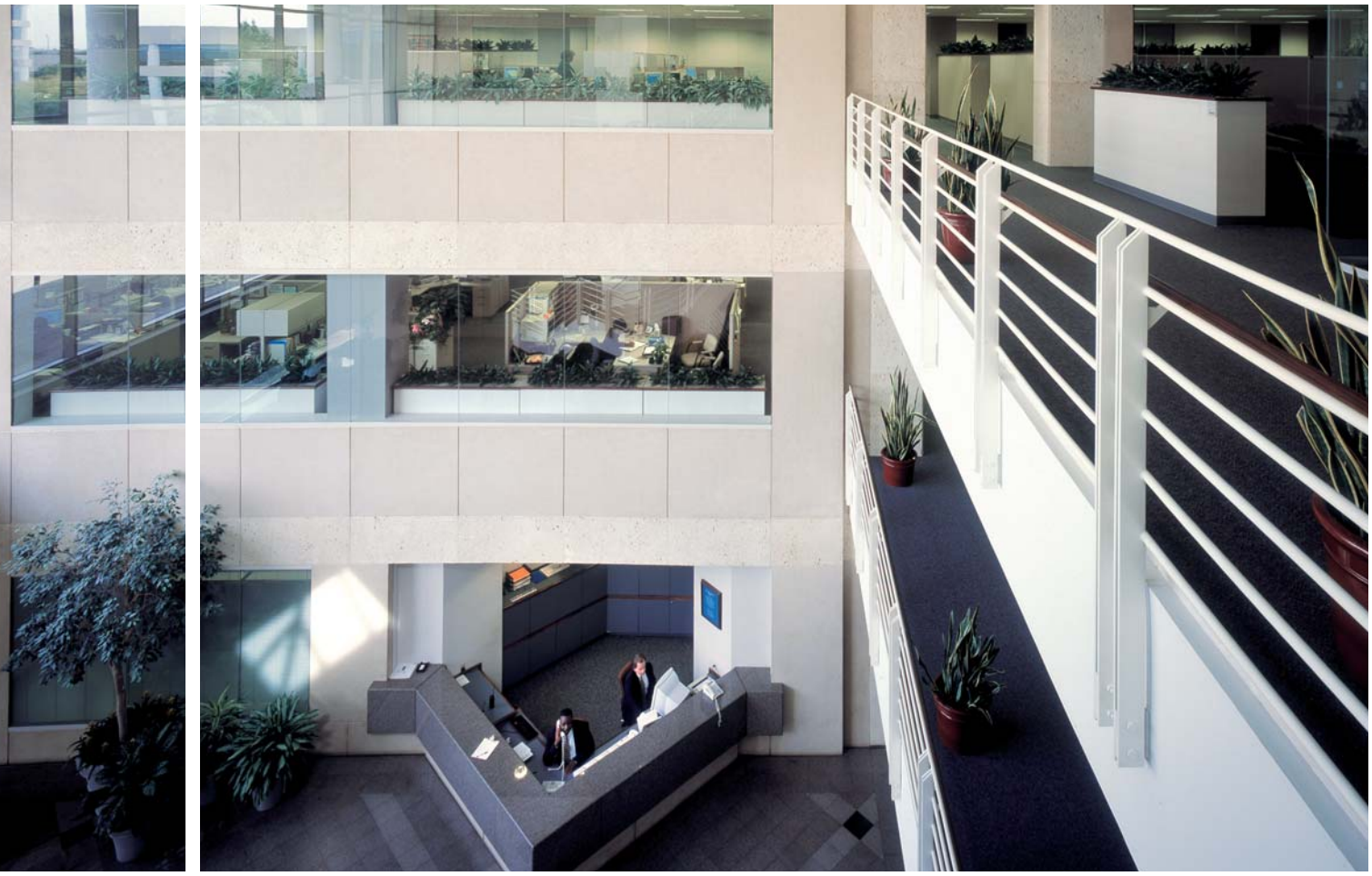
Acvatix
Valves and Actuators

Range overview

Building Technologies

SIEMENS



Acvatix valves and actuators – the decisive components for every economical and efficient HVAC plant

Based on many years of experience, extensive know-how and leading edge technology, Siemens offers the Acvatix™ line of products, a comprehensive range of valves and actuators for use in the generation, distribution and consumption in heating and cooling, as well as in district heating applications. Hence, Acvatix satisfies all requirements in the HVAC field plus those of refrigeration and industrial applications.
Whether for single-family houses or apartment blocks, complex air conditioning plants in modern office buildings or plants with large volumetric flows, Acvatix valves and actuators excel in high quality and long life. They ensure well-being and comfort and support you when it comes to energy optimization, modernization and retrofit projects.

Complete range of valves and actuators for all types of applications

HVAC and refrigeration systems operate correctly only if every plant component works reliably and accurately. The Acvatix line from Siemens offers the right valves and actuators for all your needs, all types of media, and an extensive range of applications:

- Valves and actuators for small, medium-size and very large HVAC and refrigeration systems
- Valves and actuators for room, zone and radiator applications
- 2- and 3-port seat valves, butterfly and slipper valves
- Flanged, threaded and soldered connections
- Valves driven by magnetic actuators for difficult controlled systems
- Actuators with modulating, 3-position or 2-position control signals
- Actuators operating on AC / DC 24 V or AC 110 / 230 V

Straightforward selection

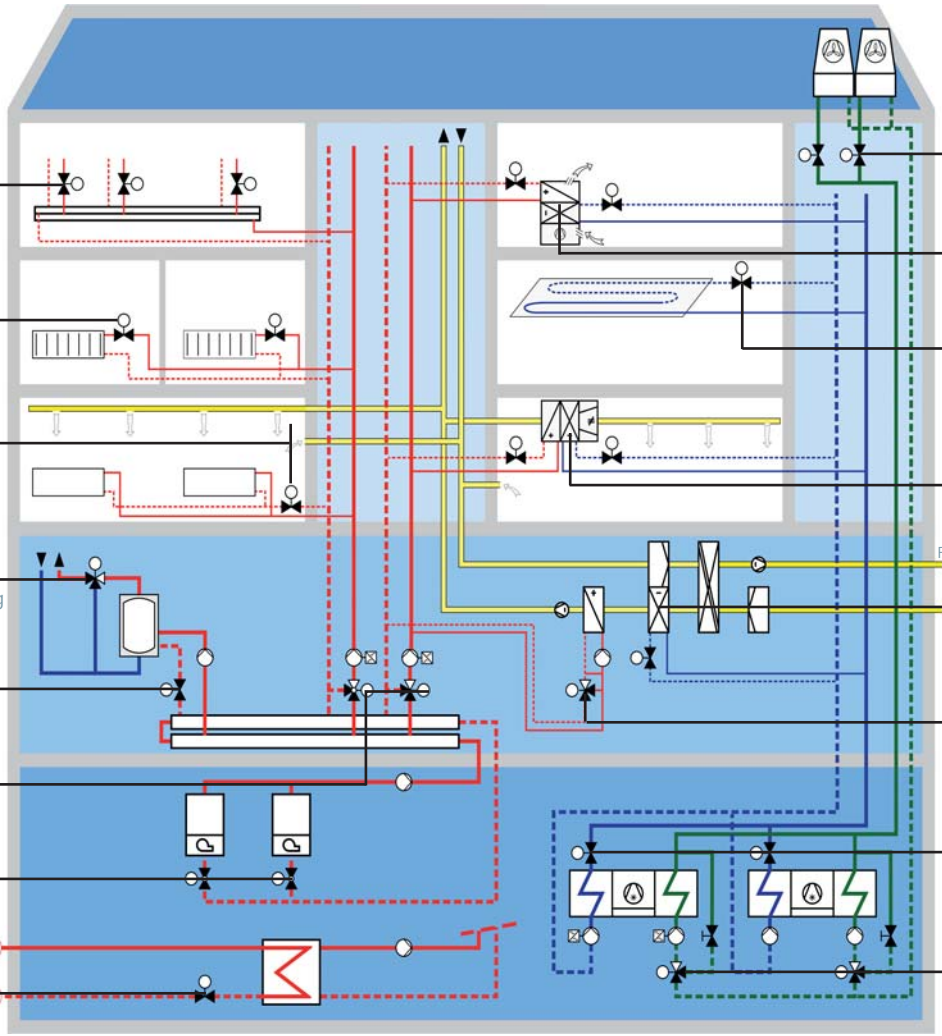
Siemens offers you tools for sizing and selecting valves and actuators, such as Easy VASP™, valve sizing rules, data sheets and online tools, and conducts standard, customized and practice-oriented training courses for planning engineers, service engineers and the engineering.

Fast delivery

Siemens' global sales network ensures fast and uncomplicated delivery.

Highlights

- Contribution to energy optimization
- Extensive product range for all types of applications
- Straightforward selection of valves and actuators
- Fast delivery



Actuating devices for HVAC and industrial plants

The functioning principle of magnetic control valves is simple: Modulating voltage is applied to a coil. The voltage pushes the metal core inside the coil against a spring, positioning the core as a function of voltage. This makes possible very fast and accurate control changes without practically causing wear and tear. Since magnetic drives produce relatively small positioning forces in comparison with motoric or electrohydraulic actuators, magnetic control valves are equipped with a pressure-compensating system. Hence, the magnetic positioning force and thus the amount of energy needed are only small.
An important design detail is the flexible valve plug which enables the valve to open without the typical inlet jump known from conventional control valves. This allows very accurate control of small loads.

The benefits
- Short positioning time (1 second)
- Highest resolution (1:1000)
- Opening without inlet jump
- Perfect low load control
- Accurate valve characteristic and positioning control

The features at a glance
- 2-port- and 3-port applications
- Selectable valve characteristic (equal-percentage and linear)
- Flanged and threaded connections
- Closed when deenergized

Air conditioning plants

Energy savings in ventilation plants thanks to improved part load behavior
Due to outdoor climate changes the proportion of the number of operating hours in which ventilation and air conditioning plants need to operate under part load conditions increases. As a result, the previous boundaries between typical winter and summer operation tend to fade. So it occurs more and more often that cooling is required in the winter also, or during intermediate seasons. With a more accurate control of temperature and humidity, energy savings of up to 30 percent is possible. Since "part load situations" occur more and more frequently while cooling costs rise over-proportionally, it is worth the effort to check the control loops and to readjust the operating parameters. In view of improved control performance, it is often economical to substitute conventional control valves by magnetic control valves.

Chilled water in refrigeration plants

Optimally controlled chilled water cycles
In contrast to heating plants where temperature control is rather simple, chilled water installations require a more sophisticated control system. Large mass volumes with small temperature differentials call for large and fast-reacting valves. Pressure-compensated magnetic valves have kvs values of up to 130 m3/h and a positioning time of less than 3 seconds with a resolution of 1:1000 and are therefore many times faster and more accurate than any other types of valves.

Domestic hot water plants

DHW heating in instantaneous heating systems
In DHW heating plants also, fast-acting instantaneous flow systems with plate heat exchangers increasingly replace the former large storage systems. The driving force behind this development are more stringent hygienic regulations aimed at reducing the risk of legionella viruses, and the efforts made to eliminate the heat losses resulting from large and therefore slow systems. Small storage tanks are only used as buffers to cover peak loads. Due to the heat transmission characteristics of plate heat exchangers, very short valve positioning times are absolutely essential. Magnetic control valves with a positioning time of 1 second guarantee a perfect control performance.

District heating and steam applications

Space-saving solutions for district heating plants
In the case of small or medium plant capacities, premanufactured compact district heat substations are used more and more frequently. Since heat transmission in these compact exchangers is considerably quicker, the controlled systems must also become faster. Where, previously, motorized valves with positioning times of 15 to 30 seconds were adequate to handle the large volumetric flows of the counter-flow units, today's plate heat exchangers with their small volumetric flows and large heat exchange surfaces demand very fast-acting valves with short positioning times. Positioning times of a few seconds are considered ideal, but such short times can practically only be attained when employing magnetic valves.

Industrial processes

Innovations thanks to better control performance
A large number of today's innovations in the industrial sector are based on manufacturing procedures taking place under well-defined environmental conditions, be it the production of machines, semiconductors, foodstuff or medicine. While years ago temperature accuracies within a few tenths of a degree Kelvin were sufficient, proportional magnetic valves can offer accuracies in the area of a few thousandth of a degree Kelvin.

Threaded / flanged 2-port and 3-port valves with integrated magnetic actuator

Typical applications	Standard range	Datasheet	High performance range
• Supply air control with / without cascade	**MXG461..**	N4455	M..P for media containing minerals
• Fast-acting heat exchanger control	**MXF461..**	N4455	M..S with valve body made of stainless cast steel
• Domestic hot water mixing control	**M3P..**	N4457	M..M silicon-free version
• High-precision process control	**MXG461B..**	N4461	
	MVF461H..	N4361	
	MXG461S..	N4465	
	MXG462S..	N4466	

Combinations	Datasheet	Type reference	DN	G [Inch]	k_{vs}	Δp_s [1] [kPa]	Δp_{max} [kPa]	Actuators AC 24 V Positioning signal
PN16	N4455	**MXG461.15..**	15	G 1B	0.6 / 1.5 / 3	300	300	0...10 V
		MXG461.20-5.0	20	G 1¼B	5	300	300	or
		MXG461.25-8.0	25	G 1½B	8	300	300	2...10 V
		MXG461.32-12	32	G 2B	12	300	300	or
		MXG461.40-20	40	G 2¼B	20	300	300	4...20 mA
		MXG461.50-30	50	G 2¾B	30	300	300	
1 °C...130 °C								
PN16	N4455	**MXF461.15..**	15	-	0.6 / 1.5 / 3	300	300	0...10 V
		MXF461.20-5.0	20	-	5	300	300	or
		MXF461.25-8.0	25	-	8	300	300	2...10 V
		MXF461.32-12	32	-	12	300	300	or
		MXF461.40-20	40	-	20	300	300	4...20 mA
		MXF461.50-30	50	-	30	300	300	
		MXF461.65-50	65	-	50	300	300	
	N4457	**M3P80FY**	80	-	80	300	300	0...10 V oder
1 °C...130 °C		**M3P100FY**	100	-	130	200	200	4...20 mA

.. = k_{vs} value

Note: To be used as 2-port or mixing valves, not as diverting valves. When used as 2-port valves, the bypass is to be closed off with a blanking flange and screws.

Combinations	Datasheet	Type reference	DN	G [Inch]	k_{vs} [m³/h]	Δp_s [1] [kPa]	Δp_{max} [kPa]	Actuators AC/DC 24 V Positioning signal
PN16	N4461	**MXG461B15-0.6**	15	G 1B	0.6	1000	1000	0...10 V
		MXG461B15-1.5	15	G 1B	1.5	1000	1000	or
		MXG461B15-3	15	G 1B	3	1000	1000	2...10 V
		MXG461B20-5	20	G 1¼B	5	800	800	or
		MXG461B25-8	25	G 1½B	8	700	700	0...20 mA
		MXG461B32-12	32	G 2B	12	600	600	or
		MXG461B40-20	40	G 2¼B	20	600	600	4...20 mA
		MXG461B50-30	50	G 2¾B	30	600	600	
-20 °C...130 °C								

Combinations	Datasheet	Type reference	DN	G [Inch]	k_{vs} [m³/h]	Δp_s [1] [kPa]	Δp_{max} [kPa]	Actuators AC/DC 24 V Positioning signal
PN16	N4361	**MVF461H15-0.6**	15	-	0.6	1000	1000	0...10 V
		MVF461H15-1.5	15	-	1.5	1000	1000	or
		MVF461H15-3	15	-	3	1000	1000	2...10 V
		MVF461H20-5	20	-	5	1000	1000	or
		MVF461H25-8	25	-	8	1000	1000	0...20 mA
		MVF461H32-12	32	-	12	1000	1000	or
		MVF461H40-20	40	-	20	1000	1000	4...20 mA
		MVF461H50-30	50	-	30	1000	1000	
1 °C...180 °C								

[1] Only for use as 2-port valves

Δp_s Maximum permissible differential pressure at which the motorized valve will close securely against the pressure (close off pressure)
Δp_{max} Maximum permissible differential pressure across the valve's control path, valid for the entire actuating range of the motorized valve (maximum recommended operating differential pressure)

Control valves and actuators for central HVAC plants

Large- and short-stroke valves with electromotoric actuators

This is the right combination of valves and actuators for all types of small and medium-size HVAC plants, offering straightforward planning, installation and commissioning. Electromotoric actuators are the ideal drives for the majority of standard applications in the fields of heating, ventilation and air conditioning. The extensive range of motorized valves also excels in an excellent price/performance ratio.

The benefits

- Excellent price/performance ratio for all types of HVAC standard applications
- Proven in their millions
- Very versatile – covering a broad application area

The features at a glance

- Single seat, metallic seating
- Long life expectancy
- Low noise level
- Leakage rate < 0.02% k_{vs}
- 3-port valves can be used as mixing or diverting valves

Large-stroke valves with with electrohydraulic actuators

For applications where great forces and safety are of prime importance, large-stroke valves in connection with electrohydraulic actuators are the number one choice. On district heating applications with their demanding requirements and, generally, on large plants, electrohydraulic actuators are unmatched. They excel in great positioning forces, robustness, spring return facility and a host of extra functions. The electrohydraulic actuators are ideally suited for the control of primary plant and for distribution circuits with a large volumetric flow.

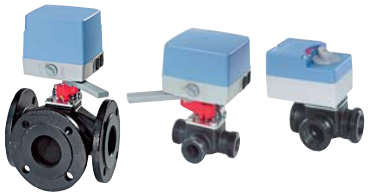
The benefits

- Powerful – for large volumetric flows and great differential pressures
- Safe and reliable – even under extreme operating conditions
- Economical – robust and long service life

The features at a glance

- Positioning forces of 2,800 N for closing pressures up to 4,000 kPa
- For safety applications with spring return times below 8 s
- Metallic sealing for temperatures up to 220 °C – thermo oil up to 350 °C
- Safe against dirt and low noise level thanks to optimized plug design
- Leakage rate < 0.02% k_{vs}
- 3-port valves can be used as mixing or diverting valves
- Threaded and flanged valves up to PN 40 and DN 150
- k_{vs} up to 300 m³/h
- Differential pressures up to 1.600 kPa

Threaded and flanged slipper valves with electromotoric actuators



Motorized slipper valves for basic applications in smaller heating systems. 3-and 4-port slipper valves are ideally suited for small, easy-to-control heating systems with small differential pressures. Both slipper valves and butterfly valves are available with directly coupled rotary actuators. These motorized valves can be installed in no time since linkages are no longer required, representing affordably priced solutions.

The benefits

- Smooth operation – long service life
- Compatible – 3-position actuator for all needs
- Time-saving – directly mounted actuators for easy commissioning

The features at a glance

- 3-port and 4-port slipper valves, internally threaded, externally threaded or flanged connections in nominal sizes DN 20 through DN 150
- Electromotoric rotary actuators operating on AC 230 V or AC 24 V, 3-position signal

Butterfly valves with electromotoric actuators

For shutoff and changeover functions in closed or open circuits. The butterfly valves cover a wide application area. The VKF46 line features air bubble-tight shutoff. For standard applications in closed circuits, the VKF41 line offers affordably priced solutions.

The benefits

- Smooth operation – long service life
- Compatible – 3-position actuator for all needs
- Time-saving – directly mounted actuators for easy commissioning

The features at a glance

- Butterfly valves from DN 40 through DN 600
- Directly mounted actuators can be combined to deliver torques up to 1.200 Nm
- Electromotoric rotary actuators operating on AC 230 V or AC 24 V, 3-position signal
- k_{vs} up to 29,300 m³/h
- Closing pressure up to 1.600 kPa

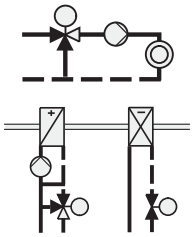
High performance 2-port and 3-port valves VXG..., VVF..., VXF...

Valves	Description		Type suffix	Example
VXG41..	Tight bypass, leakage rate 0...0.02 %		01	VXG41.1501
Valves	**Temperature**	**Sealing gland**	**Type suffix**	**Example**
VVF45.., VVF41.., VXF41..	until 180 °C	Teflon	4	VVF41.654
VVF41.., VXF41..	until 180 °C	Teflon, silicon free	5	VXF41.505
VVF61.., VXF61..	until 220 °C	Teflon, silicon free	5	VVF61.235
VVF61.., VXF61.. (kvs ≥ 1,2 m³/h)	until 350 °C	Teflon	2	VVF61.492
VVF52...	until 180 °C	Teflon	A	VVF52.15-2A
VVF52...	until 180 °C	Teflon, silicon free	M	VVF52.15-4M
VVF52... ($k_{v\ s}$ ≥ 1,25 m³/h)	until 180 °C	Teflon (saturated, superheated stream)	G	VVF52.15-8G

Threaded 2- and 3-port valves with 20 mm stroke actuators

Typical applications

- Heating plant
- Ventilation and air conditioning plant
- Heat generation
- Heat distribution
- District heating plant



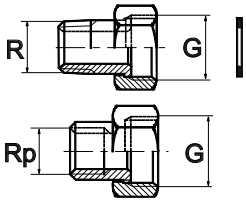
Actuators	Datasheet
SQX..	N4554
SKD32.. / 82..	N4561
SKD60 / 62..	N4563
SKB32.. / 82..	N4564
SKB60 / 62..	N4566

	Positioning signal	Positioning time [s] SQX	SKD	SKB	Spring return function	Stroke Force 700 N	20 mm 1000 N	2800 N
AC 230 V	3-position	150	120	120	-	**SQX32.00**	**SKD32.50**	**SKB32.50**
	3-position		120	120	✓		**SKD32.51**	**SKB32.51**
	3-position	35			-	**SQX32.03**		
	3-position		30		✓		**SKD32.21**	
AC 24 V	3-position	150	120	120	-	**SQX82.00**	**SKD82.50**	**SKB82.50**
	3-position		120	120	✓		**SKD82.51**	**SKB82.51**
	3-position	35			-	**SQX82.03**		
	0...10 V, 4...20 mA	35	30	120	-	**SQX62**	**SKD60**	**SKB60**
	0...10 V, 4...20 mA		30	120	✓		**SKD62**	**SKB62**

Valves	Datasheet	Type reference	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]
PN16	N4363	**VVG41.11..15**	15	G 1B	0.63 / 1 / 1.6 / 2.5 / 4	1600	800	1600	800	1600	800
		VVG41.20	20	G 1¼B	6.3	1600	800	1600	800	1600	800
		VVG41.25	25	G 1½B	10	1550	800	1600	800	1600	800
		VVG41.32	32	G 2B	16	875	800	1275	800	1600	800
		VVG41.40	40	G 2¼B	25	525	525	775	775	1600	800
		VVG41.50	50	G 2¾B	40	300	300	450	450	1225	800
- 25 °C...150 °C											
PN16	N4463	**VXG41.1301**	15	G 1B	1.6	-	800	-	800	-	800
		VXG41.1401	15	G 1B	2.5	-	800	-	800	-	800
		VXG41.15	15	G 1B	4	-	800	-	800	-	800
		VXG41.20	20	G 1¼B	6.3	-	800	-	800	-	800
		VXG41.25	25	G 1½B	10	-	800	-	800	-	800
		VXG41.32	32	G 2B	16	-	800	-	800	-	800
		VXG41.40	40	G 2¼B	25	-	525	-	775	-	800
- 25 °C...150 °C		**VXG41.50**	50	G 2¾B	40	-	300	-	450	-	800

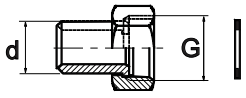
Δp_s Maximum permissible differential pressure at which the motorized valve will close securely against the pressure (close off pressure)
Δp_{max} Maximum permissible differential pressure across the valve's control path, valid for the entire actuating range of the motorized valve (maximum recommended operating differential pressure)

Union nuts for threaded valves



Type Set of 2	Set of 3	G [Inch]	R, Rp [Inch]	Material
ALG132	**ALG133**	G ½	R ⅜B (externally threaded)	Brass
ALG142	**ALG143**	G ¾	R ½B (externally threaded)	Brass
ALG122	**ALG123**	G ¾	Rp ⅜	Malleable cast iron
ALG152	**ALG153**	G 1	Rp ½	Malleable cast iron
ALG202	**ALG203**	G 1¼	Rp ¾	Malleable cast iron
ALG252	**ALG253**	G 1½	Rp 1	Malleable cast iron
ALG322	**ALG323**	G 2	Rp 1¼	Malleable cast iron
ALG402	**ALG403**	G 2¼	Rp 1½	Malleable cast iron
ALG502	**ALG503**	G 2¾	Rp 2	Malleable cast iron

Valve side: Cylindrical thread G to ISO 228-1
Pipe side: ALG... with cylindrical Rp- or tapered R-thread to ISO 7-1



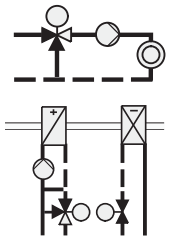
Type Set of 2	G [Inch]	Ø d [mm]	Material
ALS152	G ¾	21.3	Steel, weldable
ALS202	G 1	26.8	Steel, weldable
ALS252	G 1¼	33.7	Steel, weldable

Pipe side: ALS... with welded connection

Flanged 3-port valves with 20 / 40 mm stroke actuators

Typical applications

- Heating plant
- Ventilation and air conditioning plant
- Heat generation
- Heat distribution



Actuators	Datasheet
SQX..	N4554
SKD32.. / 82..	N4561
SKD60 / 62..	N4563
SKB / SKC32.. / 82..	N4564
SKB / SKC60 / 62..	N4566

	Positioning signal	Positioning time [s] SQX	SKD	SKC/SKB	Spring return function	Stroke Force 700 N	20 mm 1000 N	20 mm 2800 N	40 mm 2800 N
									
AC 230 V	3-position	150	120	120	-	**SQX32.00**	**SKD32.50**	**SKB32.50**	**SKC32.60**
	3-position		120	120	✓		**SKD32.51**	**SKB32.51**	**SKC32.61**
	3-position	35			-	**SQX32.03**			
	3-position		30		✓		**SKD32.21**		
AC 24 V	3-position	150	120	120	-	**SQX82.00**	**SKD82.50**	**SKB82.50**	**SKC82.60**
	3-position		120	120	✓		**SKD82.51**	**SKB82.51**	**SKC82.61**
	3-position	35			-	**SQX82.03**			
	0...10 V, 4...20 mA	35	30	120	-	**SQX62**	**SKD60**	**SKB60**	**SKC60**
	0...10 V, 4...20 mA		30	120	✓		**SKD62**	**SKB62**	**SKC62**

Valves	Datasheet	Type reference	DN	k_{vs} [m³/h]	Δp_{max} [kPa]	Δp_{max} [kPa]	Δp_{max} [kPa]	Δp_{max} [kPa]
PN6	N4410	**VXF21.22..25** [1]	25	1.9 / 3 / 5 / 7.5	300	300	300	-
		VXF21.25-.. [1]	25	2.5 / 4 / 6.3 / 10	300	300	300	-
		VXF21.39..40	40	12 / 19	300	300	300	-
		VXF21.40-..	40	16 / 25	300	300	300	-
		VXF21.50	50	31	300	300	300	-
		VXF21.50-40	50	40	300	300	300	-
		VXF21.65	65	49	175	275	300	-
		VXF21.65-63	65	63	175	275	300	-
		VXF21.80	80	78	100	175	300	-
		VXF21.80-100	80	100	100	175	300	-
		VXF21.90	100	124	-	-	-	200
-10 °C...150 °C		**VXF21.100-160**	100	160	-	-	-	200
PN10	N4420	**VXF31.15-..**	15	2.5 / 4	300	300	300	-
		VXF31.24..25	25	5 / 7.5	300	300	300	-
		VXF31.25-..	25	6.3 / 10	300	300	300	-
		VXF31.39..40	40	12 / 19	300	300	300	-
		VXF31.40-..	40	16 / 25	300	300	300	-
		VXF31.50	50	31	300	300	300	-
		VXF31.50-40	50	40	300	300	300	-
		VXF31.65	65	49	175	275	300	-
		VXF31.65-63	65	63	175	275	300	-
		VXF31.80	80	78	100	175	300	-
		VXF31.80-100	80	100	100	175	300	-
		VXF31.90	100	124	-	-	-	200
		VXF31.100-160	100	160	-	-	-	200
		VXF31.91	125	200	-	-	-	150
		VXF31.125-250	125	250	-	-	-	150
		VXF31.92	150	300	-	-	-	100
-10 °C...150 °C		**VXF31.150-315**	150	315	-	-	-	100
PN16	N4430	**VXF40.15-..**	15	1.9 / 2.5 / 3 / 4	300	300	300	-
		VXF40.25-..	25	5 / 6.3 / 7.5 / 10	300	300	300	-
		VXF40.40-..	40	12 / 16 / 19 / 25	300	300	300	-
		VXF40.50-..	50	31 / 40	300	300	300	-
		VXF40.65-..	65	49 / 63	175	275	300	-
		VXF40.80-..	80	78 / 100	100	175	300	-
		VXF40.100-..	100	124 / 160	-	-	-	200
		VXF40.125-..	125	200 / 250	-	-	-	150
-10 °C...150 °C		**VXF40.150-..**	150	300 / 315	-	-	-	100
PN16	N4440	**VXF41.14..15**	15	1.9 / 3	800	800	800	-
		VXF41.24..25	25	5 / 7.5	800	800	800	-
		VXF41.39..40	40	12 / 19	500	750	800	-
		VXF41.49..50	50	19 / 31	350	500	800	-
		VXF41.65	65	49	-	-	-	500
		VXF41.80	80	78	-	-	-	350
		VXF41.90	100	124	-	-	-	250
		VXF41.91	125	200	-	-	-	175
-10 °C...150 °C (180 °C)		**VXF41.92**	150	300	-	-	-	100
PN40	N4482	**VXF61.14..15**	15	1.9 / 3	-	1200	1600	-
		VXF61.24..25	25	5 / 7.5	-	1200	1600	-
		VXF61.39..40	40	12 / 19	-	-	1200	-
		VXF61.49..50	50	19 / 31	-	-	1000	-
		VXF61.65	65	49	-	-	-	800
		VXF61.80	80	78	-	-	-	500
		VXF61.90	100	124	-	-	-	300
		VXF61.91	125	200	-	-	-	200
-25 °C...220 °C (350 °C)		**VXF61.92**	150	300	-	-	-	125

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

14...15, 22...25, 24...25, 39...40, 49...50 = insert number instead of k_{vs}-value

Flanged 2-port valves with 20 / 40 mm stroke actuators

Typical applications	Actuators	Datasheet	Stroke / Force	20 mm 700 N	20 mm 1000 N	20 mm 2800 N	40 mm 2800 N
• Heating plant • Ventilation and air conditioning plant • Heat generation • Heat distribution • District heating plant	**SQX..**	N4554					
	SKD32.. / 82..	N4561					
	SKD60 / 62..	N4563					
	SKB / SKC32.. / 82..	N4564					
	SKB / SKC60 / 62..	N4566					
	Details see opposing side			**SQX..**	**SKD..**	**SKB..**	**SKC..**

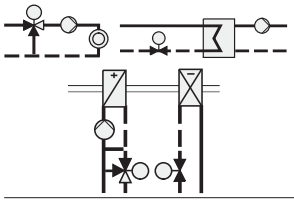
Valves	Datasheet	Type reference	DN	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
PN6	N4310	**VVF21.22..25** [1]	25	1.9 / 3 / 5 / 7.5	600	300	600	300	600	300	-	-
		VVF21.25-.. [1]	25	2.5 / 4 / 6.3 / 10	600	300	600	300	600	300	-	-
		VVF21.39..40	40	12 / 19	500	300	600	300	600	300	-	-
		VVF21.40-..	40	16 / 25	500	300	600	300	600	300	-	-
		VVF21.50	50	31	300	300	450	300	600	300	-	-
		VVF21.50-40	50	40	300	300	450	300	600	300	-	-
		VVF21.65	65	49	175	175	275	275	600	300	-	-
		VVF21.65-63	65	63	175	175	275	275	600	300	-	-
		VVF21.80	80	78	100	100	175	175	500	300	-	-
		VVF21.80-100	80	100	100	100	175	175	500	300	-	-
		VVF21.90	100	124	-	-	-	-	-	-	300	200
-10 °C...150 °C		**VVF21.100-160**	100	160	-	-	-	-	-	-	300	200
PN10	N4320	**VVF31.15-..**	15	2.5 / 4	1000	300	1000	300	1000	300	-	-
		VVF31.24..25	25	5 / 7.5	1000	300	1000	300	1000	300	-	-
		VVF31.25-..	25	6.3 / 10	1000	300	1000	300	1000	300	-	-
		VVF31.39..40	40	12 / 19	525	300	775	300	1000	300	-	-
		VVF31.40-..	40	16 / 25	525	300	775	300	1000	300	-	-
		VVF31.50	50	31	325	300	475	300	1000	300	-	-
		VVF31.50-40	50	40	325	300	475	300	1000	300	-	-
		VVF31.65	65	49	175	175	275	275	750	300	-	-
		VVF31.65-63	65	63	175	175	275	275	750	300	-	-
		VVF31.80	80	78	100	100	175	175	500	300	-	-
		VVF31.80-100	80	100	100	100	175	175	500	300	-	-
		VVF31.90	100	124	-	-	-	-	-	-	300	200
		VVF31.100-160	100	160	-	-	-	-	-	-	300	200
		VVF31.91	125	200	-	-	-	-	-	-	200	150
		VVF31.125-250	125	250	-	-	-	-	-	-	200	150
		VVF31.92	150	300	-	-	-	-	-	-	125	100
-10 °C...150 °C		**VVF31.150-315**	150	315	-	-	-	-	-	-	125	100
PN16	N4330	**VVF40.15-..**	15	1.9 / 2.5 / 3 / 4	1600	300	1600	300	1600	300	-	-
		VVF40.25-..	25	5 / 6.3 / 7.5 / 10	1550	300	1600	300	1600	300	-	-
		VVF40.40-..	40	12 / 16 / 19 / 25	525	300	775	300	1600	300	-	-
		VVF40.50-..	50	31 / 40	325	300	475	300	1300	300	-	-
		VVF40.65-..	65	49 / 63	175	175	275	275	750	300	-	-
		VVF40.80-..	80	78 / 100	100	100	175	175	500	300	-	-
		VVF40.100-..	100	124 / 160	-	-	-	-	-	-	300	200
		VVF40.125-..	125	200 / 250	-	-	-	-	-	-	200	150
-10 °C...150 °C		**VVF40.150-..**	150	300 / 315	-	-	-	-	-	-	125	100
PN16	N4340	**VVF41.49..50**	50	19 / 31	350	300	500	400	1400	1000	-	-
		VVF41.65	65	49	-	-	-	-	-	-	800	600
		VVF41.80	80	78	-	-	-	-	-	-	500	400
		VVF41.90	100	124	-	-	-	-	-	-	300	250
		VVF41.91	125	200	-	-	-	-	-	-	200	175
-10 °C...150 °C (180 °C)		**VVF41.92**	150	300	-	-	-	-	-	-	125	100
PN16	N4345	**VVF45.49..50**	50	19 / 31	-	-	-	-	1600	1200	-	-
		VVF45.65	65	49	-	-	-	-	-	-	1600	1000
		VVF45.80	80	78	-	-	-	-	-	-	1600	700
		VVF45.90	100	124	-	-	-	-	-	-	1600	450
		VVF45.91	125	200	-	-	-	-	-	-	1600	300
-10 °C...150 °C (180 °C)		**VVF45.92**	150	300	-	-	-	-	-	-	1600	200
PN25	N4373	**VVF52.15-..**	15	0.16 / 0.2 / 0.25 / 0.32 / 0.4 / 0.5 / 0.63	2500	1600	2500	1600	2500	1600	-	-
		VVF52.15-..	15	0.8 / 1/ 1.25 / 1.6 / 2 / 2.5 / 3.2 / 4	2500	1600	2500	1600	2500	1600	-	-
		VVF52.25-..	25	5 / 6.3 / 8 / 10	1500	1200	2250	1600	2500	1600	-	-
-20 °C...150 °C (180 °C)		**VVF52.40-..**	40	12.5 / 16 / 20 / 25	500	400	750	700	2000	1600	-	-
PN40	N4382	**VVF61.09..15**	15	0.19 / 0.3 / 0.45 / 0.7 / 1.2 / 1.9 / 3	-	-	4000	1600	4000	1600	-	-
		VVF61.23..25	25	3 / 5 / 7.5	-	-	2250	1600	4000	1600	-	-
		VVF61.39..40	40	12 / 19	-	-	-	-	4000	1600	-	-
		VVF61.49..50	50	19 / 31	-	-	-	-	4000	1600	-	-
		VVF61.65	65	49	-	-	-	-	-	-	4000	1000
		VVF61.80	80	78	-	-	-	-	-	-	4000	700
		VVF61.90	100	124	-	-	-	-	-	-	4000	450
		VVF61.91	125	200	-	-	-	-	-	-	4000	300
-25 °C...220 °C (350 °C)		**VVF61.92**	150	300	-	-	-	-	-	-	4000	200

[1] .. = k_{vs}-value 09...15, 22...25, 23...25, 24...25, 39...40, 49...50 = insert number instead of k_{vs}-value

Threaded 2-port and 3-port valves with 5.5 mm stroke actuators 400 N

Typical applications

- Heating plant
- District heating
- Ventilation and air conditioning plant



Actuators	Datasheet	Stroke / Force				5.5 mm / 400 N	
SQS..	N4573						
	Positioning signal	**Positioning time [s]**		**Spring return**			
AC 230 V	3-position	150	150	✓	-	**SQS35.50**	**SQS35.00**
	3-position	35	35	✓	-	**SQS35.53**	**SQS35.03**
AC 24 V	3-position		150	-	-		**SQS85.00**
	3-position		35	-	-		**SQS85.03**
	0..10 V	35	35	✓	-	**SQS65.5**	**SQS65**
	2..10 V		35	-	-		**SQS65.2**

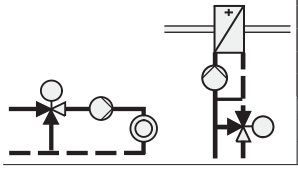
Valves	Datasheet	Type reference	DN	G [Inch]	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]
PN16	N4364	**VVG44.15-..**	15	G 1B	0.25 / 0.4 / 0.63	1600	400
		VVG44.15-..	15	G 1B	1 / 1.6	725	400
		VVG44.15-..	15	G 1B	2.5 / 4	400	400
		VVG44.20-6.3	20	G 1¼B	6.3	750	400
		VVG44.25-10	25	G 1½B	10	450	400
		VVG44.32-16	32	G 2B	16	250	250
1...120 °C		**VVG44.40-25**	40	G 2¼B	25	125	125
PN16	N4464	**VXG44.15-..**	15	G 1B	0.25 / 0.4 / 0.63	-	400
		VXG44.15-..	15	G 1B	1 / 1.6	-	400
		VXG44.15-..	15	G 1B	2.5 / 4	-	400
		VXG44.20-6.3	20	G 1¼B	6.3	-	400
		VXG44.25-10	25	G 1½B	10	-	400
		VXG44.32-16	32	G 2B	16	-	250
1...120 °C		**VXG44.40-25**	40	G 2¼B	25	-	125
PN25	N4379	**VVG55.15-..**	15	G ¾B	0.25 / 0.4	2500	1200
		VVG55.15-..	15	G ¾B	0.63	2500	1200
		VVG55.15-..	15	G ¾B	1 / 1.6	2300	1200
		VVG55.15-..	15	G ¾B	2.5	2300	1200
		VVG55.20-4	20	G 1B	4	1000	1000
		VVG55.25-6.3	25	G 1¼B	6.3	800	800
1...130 °C							

.. = k_{vs}-value

Threaded 2-port and 3-port valves with 5.5 mm stroke actuators 300 N

Typical applications

- Heating plants
- Ventilation plants



Actuators	Datasheet	Stroke / Force				5.5 mm / 300 N	
SSC..	N4895						
	Positioning signal	**Positioning time [s]**		**Spring return**			
AC 230 V	3-position	150		-	-	**SSC31**	
AC 24 V	3-position	150		-	-	**SSC81**	
AC / DC 24 V	0..10 V	30	30	-	✓	**SSC61**	**SSC61.5**

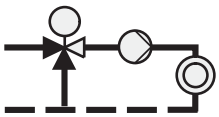
Valves	Datasheet	Type reference	DN	G [Inch]	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]
PN16	N4845	**VVP45.20-4**	20	G 1B	4	350	350
		VVP45.25-6.3	25	G 1¼B	6.3	300	300
		VVP45.25-10	25	G 1½B	10	300	300
		VVP45.32-16	32	G 2B	16	175	175
		VVP45.40-25	40	G 2¼B	25	75	75
1...110 °C							
PN16		**VXP45.20-4**	20	G 1B	4	-	350
		VXP45.25-6.3	25	G 1¼B	6.3	-	300
		VXP45.25-10	25	G 1½B	10	-	300
		VXP45.32-16	32	G 2B	16	-	175
		VXP45.40-25	40	G 2¼B	25	-	75
1...110 °C							

Note: For DN10...DN15 with k_{vs} = 0.25...2.5 m³/h, VVP45... and VXP45... valves can be used (refer to page 14)

3-port and 4-port slipper valves with rotary actuators

Typical applications

- Small to medium size heating plants



Actuators	Datasheet	Torque	5 Nm	5 Nm	10 Nm / 12.5 Nm
SQK34.. / 84..	N4508				
SQK33..	N4506				
SQL33.. / 83..	N4506				
	Positioning signal	**Positioning time** [s]			
AC 230 V	3-position	125		**SQK33.00**	**SQL33.00**
	3-position	30			**SQL33.03**
	3-position	135	**SQK34.00**		
AC 24 V	3-position	125			**SQL83.00**
	3-position	135	**SQK84.00**		
Mounting kits			**-**	**ASK32**	**ASK31** **ASK32**

3-port slipper valves flanged	Datasheet	Type reference	DN	k_{vs} [m³/h]	Δp_{max} [kPa]	Δp_{max} [kPa]	Δp_{max} [kPa]	Δp_{max} [kPa]
PN6	N4241	**VBF21.40**	40	25	30	30	-	30
		VBF21.50	50	40	30	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	-
1...120 °C								

3-port slipper valves Externally or internally threaded	Datasheet	Type reference	DN	G / Rp [Inch]	k_{vs} [m³/h]	Δp_{max} [kPa]	Δp_{max} [kPa]	Δp_{max} [kPa]	Δp_{max} [kPa]
PN10	N4233	**VBG31.20**	20	G 1¼B	6.3	30	30	-	30
		VBG31.25	25	G 1½B	10	30	30	-	30
		VBG31.32	32	G 2B	16	30	30	-	30
		VBG31.40	40	G 2¼B	25	30	30	-	30
1...120 °C									
PN10	N4232	**VBI31.20**	20	Rp ¾	6.3	30	30	-	30
		VBI31.25	25	Rp 1	10	30	30	-	30
		VBI31.32	32	Rp 1¼	16	30	30	-	30
		VBI31.40	40	Rp 1½	25	30	30	-	30
1...120 °C									

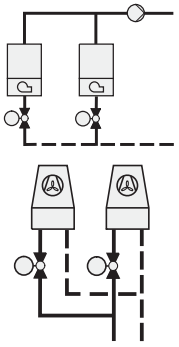
4-port slipper valves Internally threaded	Datasheet	Type reference	DN	Rp [Inch]	k_{vs} [m³/h]	Δp_{max} [kPa]	Δp_{max} [kPa]	Δp_{max} [kPa]	Δp_{max} [kPa]
PN10	N4252	**VCI31.20**	20	Rp ¾	6.3	30	30	-	30
		VCI31.25	25	Rp 1	10	30	30	-	30
		VCI31.32	32	Rp 1¼	16	30	30	-	30
		VCI31.40	40	Rp 1½	25	30	30	-	30
1...120 °C									

Δp_s Maximum permissible differential pressure at which the motorized valve will close securely against the pressure (close off pressure)
Δp_{max} Maximum permissible differential pressure across the valve's control path, valid for the entire actuating range of the motorized valve (maximum recommended operating differential pressure)

Butterfly valves for mounting between flanges, with rotary actuators

Typical applications

- Shut off or control
- For closed or open loop HVAC plant



Actuators	Datas heet	Torque	12.5 Nm	20 Nm	40 Nm		100 Nm	400 Nm	1200 Nm
SQL33..	N4506								
SQL83..	N4506								
SQL35..	N4505								
SQL85..	N4505								
SQL36..	N4505								
	Positioning signal	**Positioning time** [s]							
AC 230 V	3-position	6 [1]					**SQL36E65**		
	3-position	12 [1]						**SQL36E110**	
	3-position	24 [1]							**SQL36E160**
	3-position	25			**SQL36E50F04**				
	3-position	25				**SQL36E50F05**			
	3-position	30	**SQL33.03**[2]						
	3-position	125	**SQL33.00**	**SQL35.00**					
AC 24 V	3-position	125	**SQL83.00**	**SQL85.00**					

[1] With auxiliary module SEZ31: Variable positioning time SQL36E65: 30...180 s, SQL35E110 60...360 s, SQL36E160: 120..720 s
[2] Torque 10 Nm

Mounting kits	**ASK33**	**ASK35.1**	**ASK35.2**	-	-	-	-

Butterfly valves	**Datasheet**	**Type reference**	**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]
PN16	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	1'000	300	-	-	-	-	-	-	-
		VKF41.150	150	2'100	250	500 [3]	500 [3]	-	-	-	-	-
		VKF41.200	200	4'000	125	300 [3]	300 [3]	-	-	-	-	-
-15...120 °C												
PN16	N4136	**VKF46.40**	40	50	-	1'600	-	1'600	-	-	-	-
		VKF46.50	50	85	-	1'600	-	1'600	-	-	-	-
		VKF46.65	65	215	-	1'600	-	1'600	-	-	-	-
		VKF46.80	80	420	-	-	1'600	-	1'600	-	-	-
		VKF46.100	100	800	-	-	1'600	-	1'600	-	-	-
		VKF46.125	125	1'010	-	-	1'000	-	1'000	-	-	-
		VKF46.150	150	2'100	-	-	-	-	-	1'600	-	-
		VKF46.200	200	4'000	-	-	-	-	-	1'000	-	-
		VKF46.250	250	6'400	-	-	-	-	-	-	1'000	-
		VKF46.300	300	8'500	-	-	-	-	-	-	1'000	-
		VKF46.350	350	11'500	-	-	-	-	-	-	600	-
		VKF46.400	400	14'500	-	-	-	-	-	-	300	-
		VKF46.450	450	20'500	-	-	-	-	-	-	-	300
		VKF46.500	500	21'000	-	-	-	-	-	-	-	300
-10...120 °C		**VKF46.600**	600	29'300	-	-	-	-	-	-	-	300
PN16	N4136	**VKF46.350TS**	350	11'500	-	-	-	-	-	-	-	1'000
		VKF46.400TS	400	14'500	-	-	-	-	-	-	-	1'000
		VKF46.450TS	450	20'500	-	-	-	-	-	-	-	1'000
		VKF46.500TS	500	21'000	-	-	-	-	-	-	-	1'000
		VKF46.600TS	600	29'300	-	-	-	-	-	-	-	1'000
-10...120 °C												

[3] with ASK35 mounting kit

Recommended maximum velocity of flow and the butterfly valve fully open VKF41.. 4 m/s for water, 40 m/s for gas
VKF46.. 4.5 m/s for water, 60 m/s for gas

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

Control valves and actuators for room and zone applications

Elite Line

High-performance values and actuators for all room and zone applications
This valve/actuator combination is just right for small to mid-sized HVAC plants. It is easy to engineer, install and commission and distinguishes itself through excellent price-to-performance ratios, robustness and long life cycles, providing the prerequisite to engineering energy efficient plants. Pluggable connection cable also available halogen-free.

Benefits
- Control technologically robust valve/actuator combinations
- Energy efficient solution thanks to automated stroke adaptation
- High closing pressure

The Features at a glance
- Valves with equal-percentage characteristics
- Hot-pressed brass with external threads
- 2-port and 3-port valves with bypass
- Actuators for 3-position and 0...10 V positioning signals
- Actuators with auxiliary switch

Standard Line

Universal valves and actuators line for all room and zone applications
This product family offers solutions for all HVAC applications in zones and rooms. Whether electrothermic, electromotoric, NC or NO function, On/Off or modulated, the ideal combination is always available. These products harmonize perfectly with room controllers and individual room control systems.
Pluggable connection cable also available halogen-free.

Benefits
- Broad product range of actuators for any application
- Energy efficient solution thanks to automated stroke adaptation
- Hot-pressed brass for long-term stability

The Features at a glance
- Valves with linear characteristics
- External treads or compression fittings
- 2-port and 3-port valves with bypass
- Thermostatic, thermal and electromotoric actuators
- Actuators for 2-point, 3-point and 0...10 V positioning signals
- Actuators with spring returns for 2-point positioning signals

TRV Line

Broad program for radiator valves and actuators
Radiator valves and actuators designed for heating plants using radiators with the widest possible construction and connection types. A broad product range of thermostatic, thermal and electromotoric actuators for Siemens radiator valves and valves other manufacturers. Various accessories such as hand wheels, adapters to third-party valves and compression fittings for copper, soft steel and pvc pipes with and without aluminium foil.
Pluggable connection cable also available halogen-free.

Benefits
- Broad product range of radiator valves
- Thermostatic, thermal and electromotoric actuators for Siemens and third-party radiator valves
- Integrated pre-adjustment of k_v-values for radiator and small valves
- Closed thermostat head to meet demanding hygienic requirements

The Features at a glance
- Pre-adjustements fort radiator and heating plant hydraulic balancing
- MiniCombiValves (MCV) for the automated hydraulic balancing of heating plants
- Actuators for AC/DC 24 V and AC 230 V
- Actuators for 2-point, 3-point and 0...10 V positioning signals
- EN 215

On/Off Line

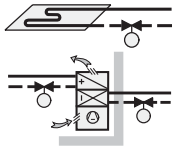
The zone valves family for On/Off control with spring return
A compact product range of zone valves and actuators; typically combined with room thermostats for On/Off control or in heating as changeover valves.

Benefits
- Separate valve-actuator combination
- Ergonomc actuators
- 2-wire control with return spring

The Features at a glance
- 2-port and 3-port values in hot-pressed brass
- Actuators for AC 24 V and AC 230 V
- Auxiliary switch can also be added as an accessory
- Mounted connection cable

Control valves and actuators for room and zone applications

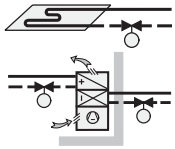
Elite Line

Typical applications	Actuators	Datasheet	Positioning signal	Positioning time [s]	Auxiliary switch	Stroke Force	5.5 mm 200 N	
• Terminal units • Induction units • Chilled ceilings	**SSB..**	**N4891**						
	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**	-

Valves	Datasheet	Typ	DN	G [Inch]	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_s [kPa]
PN16	N4845	**VVP45.10-..**	10	G ½B	0.25 / 0.4 / 0.63	725	400	725	400
		**VVP45.10-..**	10	G ½B	1 / 1.6	725	400	725	400
		VVP45.15-..	15	G ¾B	2.5	350	350	350	350
		VVP45.20-..	20	G 1B	4	350	350	350	350
1...110 °C		**VVP45.25-..**	25	G 1¼B	6.3	300	300	300	300
PN16		**VXP45.10-..**	10	G ½B	0.25 / 0.4 / 0.63	-	400	-	400
		**VXP45.10-..**	10	G ½B	1 / 1.6	-	400	-	400
		VXP45.15-..	15	G ¾B	2.5	-	350	-	350
		VXP45.20-..	20	G 1B	4	-	350	-	350
1...110 °C		**VXP45.25-..**	25	G 1¼B	6.3	-	300	-	300
PN16		**VMP45.10-..**	10	G ½B	0.25 / 0.4	-	400	-	400
		**VMP45.10-..**	10	G ½B	0.63 / 1	-	400	-	400
		VMP45.10-..	10	G ½B	1.6	-	400	-	400
		VMP45.15-..	15	G ¾B	2.5	-	350	-	350
		VMP45.20-..	20	G 1B	4	-	350	-	350
1...110 °C									

.. = k_{vs} value

Standard Line

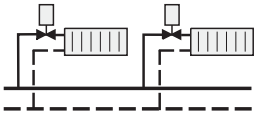
Typical applications	Actuators	Datasheet	Positioning signal	Positioning time [s]	Stroke Force	105 N		2.5 mm 125 N	135 N	160 N
• Terminal units • Induction units • Chilled ceilings	**STP21.. / 71..** **STP72E..** **SFP..** **SSP..** **STS61..**	N4878 N4876 N4865 N4864 N4880								
	AC 230 V		2-position	180		**STP21**				
			2-position	10					**SFP21**	
			3-position	150						**SSP31**
	AC 24 V		2-position	10					**SFP71**	
			3-position	43						**SSP81.04**
			3-position	150						**SSP81**
			0...10 V	< 150				**STS61**		
	AC/DC 24 V		2-position / PDM	180		**STP71**	**STP72E**			
			0...10 V	34						**SSP61**
			5...7.5 V	34						**SSP61P**

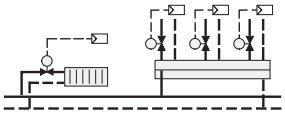
Valves	Datasheet	Typ	DN	G [Inch]	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
PN16	N4847	**VVP47.10-..**	10	G ½B	0.25 / 0.4	700	400	1000	400
		**VVP47.10-..**	10	G ½B	0.63 / 1	250	250	500	400
		VVP47.10-..	10	G ½B	1.6	150	150	300	300
		VVP47.15-..	15	G ¾B	2.5	150	150	300	300
1...110 °C		**VVP47.20-..**	20	G 1B	4	100	100	175	175
PN16		**VXP47.10-..**	10	G ½B	0.25 / 0.4	-	400	-	400
		**VXP47.10-..**	10	G ½B	0.63 / 1	-	250	-	400
		VXP47.10-..	10	G ½B	1.6	-	150	-	300
		VXP47.15-..	15	G ¾B	2.5	-	150	-	300
1...110 °C		**VXP47.20-..**	20	G 1B	4	-	100	-	175
PN16		**VMP47.10-..**	10	G ½B	0.25 / 0.4	-	400	-	400
		**VMP47.10-..**	10	G ½B	0.63 / 1	-	250	-	400
		VMP47.10-..	10	G ½B	1.6	-	150	-	300
		VMP47.15-..	15	G ¾B	2.5	-	150	-	300
1...110 °C									

.. = k_{vs}-value

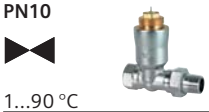
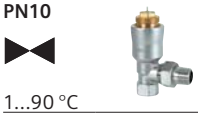
Control valves and actuators for room and zone applications

TRV Line

Typical applications	Actuators	Datasheet			
• Radiators	**RTN..**	N2111			
	Thermal		**RTN51** **RTN51G**	**RTN71**	**RTN81**

Typical applications	Actuators	Datasheet	Stroke / Force	2,5 mm / 105 N	100 N	125 N	105 N
• Radiators • Fan coil • Chilled ceilings • Zone control	**STA21.. / 71..** **STA72E..** **SSA..** **STS61..** **STP21.. / 71..** **STP72E..**	N4877 N4875 N4893 N4880 N4878 N4876					
		Positioning signal	Positioning time [s]				
	AC 230 V	2-position	180	**STA21**			**STP21**
		3-position	150		**SSA31**		
	AC 24 V	3-position	150		**SSA81**		
		0...10 V	< 150			**STS61**	
	AC/DC 24 V	2-position / PDM	180	**STA71**			**STP71**
		2-position / PDM	180	**STA72E**			**STP72E**
		0...10 V	34		**SSA61**		
	Normally Open / Normally Closed			**NC**	-	**NC** / NO	NO

Radiator valves	Datasheet	Type DIN	NF	DN	G [Inch]	k_v [m³/h]	Δp_{max} [kPa]
PN10	N2105	**VDN110**	**VDN210**	10	Rp/R ⅜	0,09...0.63	60
	N2106	**VDN115**	**VDN215**	15	Rp/R ½	0,10...0.89	60
		VDN120	**VDN220**	20	Rp/R ¾	0.31...1,41	60
1...120 °C							
PN10		**VEN110**	**VEN210**	10	Rp/R ⅜	0,09...0.63	60
		**VEN115**	**VEN215**	15	Rp/R ½	0,10...0.89	60
		VEN120	**VEN220**	20	Rp/R ¾	0.31...1,41	60
1...120 °C							
PN10			**VUN210**	10	Rp/R ⅜	0,14...0.60	60
			**VUN215**	15	Rp/R ½	0,13...0.77	60
1...120 °C							

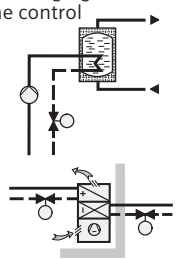
MCV – Pressure compensated radiator valves	Datasheet	Type DIN	NF	DN	G [Inch]	$\dot{V}$ [m³/h]	Δp_{max} [kPa]
PN10	N2185	**VPD110A-..**	**VPD210A-..**	10	Rp/R ⅜	25...318	200
		**VPD115A-..**	**VPD215A-..**	15	Rp/R ½	25...318	200
		VPD110B-..	**VPD210B-..**	10	Rp/R ⅜	31...483	200
		VPD115B-..	**VPD215B-..**	15	Rp/R ½	31...483	200
1...90 °C							
PN10		**VPE110A-..**	**VPE210A-..**	10	Rp/R ⅜	25...318	200
		**VPE115A-..**	**VPE215A-..**	15	Rp/R ½	25...318	200
		VPE110B-..	**VPE210B-..**	10	Rp/R ⅜	31...483	200
		VPE115B-..	**VPE215B-..**	15	Rp/R ½	31...483	200
1...90 °C							

A: Δp_w = 5 kPa .. = $V_{nominal}$ = 45 / 90 / 145 [l/h]
B: Δp_w = 10 kPa .. = $V_{nominal}$ = 60 / 120 / 200 [l/h]

Small valves for higher k_{vs} values	Datasheet	Type	DN	G [Inch]	k_v [m³/h]	Δp_{max} [kPa]
PN10	N2103	**VD115CLC**	15	Rp/R ½	0.25...1.9	150
		**VD120CLC**	20	Rp/R ¾	0.28...2.6	150
		VD125CLC	25	Rp/R 1	0.25...2.6	150
1...110 °C						

On/Off Line

Typical applications	Actuators	Datasheet	Stroke / Force	200 N	2,5 mm 105 N	125 N
• Terminal units • Domestic hot water storage tank charging • Zone control	**SFA..** **STA21../71..** **STA72E..** **STS61..**	N4863 N4877 N4875 N4880				
		Positioning signal	**Positioning time** [s]			
	AC 230 V	2-position	10	**SFA21/18**		
		2-position	180		**STA21**	
	AC 24 V	2-position	10	**SFA71/18**		
		0...10 V	< 150			**STS61**
	AC/DC 24 V	2-position / PDM	180		**STA71**	
		2-position / PDM	180		**STA72E**	



Valves with threaded connections	Datasheet	Type	DN	G [Inch]	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
PN16	N4842	**VVI46.15**	15	Rp ½	2	300	300	200	200
		VVI46.20	20	Rp ¾	3.5	300	300	200	200
		VVI46.25	25	Rp 1	5	300	300	200	200
1...110 °C									
PN16		**VXI46.15** [1]	15	Rp ½	2	-	300	-	200
		VXI46.20 [1]	20	Rp ¾	3.5	-	300	-	200
		VXI46.25 [1]	25	Rp 1	5	-	300	-	200
		VXI46.25T [2]	25	Rp 1	5	-	200	-	200
1...110 °C									

Valves with solder connections	Datasheet	Type	DN	Inner Ø [mm]	k_{vs} [m³/h]	Δp_s [kPa]	Δp_{max} [kPa]	Δp_s [kPa]	Δp_{max} [kPa]
PN16	N4842	**VVS46.15**	15	16	2	300	300	200	200
		VVS46.20	20	22.37	3.5	300	300	200	200
		VVS46.25	25	28.75	5	300	300	200	200
1...110 °C									
PN16		**VXS46.15**	15	16	2	-	300	-	200
		VXS46.20	20	22.37	3.5	-	300	-	200
		VXS46.25	25	28.75	5	-	300	-	200
1...110 °C									

[1] 70 % k_{vs} in bypass, leakage rate in bypass 2..5 % of k_{vs} value
[2] 100 % k_{vs} in bypass, leakage rate in bypass 0.05 % of k_{vs} value

In the case of 3-port valves, the Δpmax values apply to the «diverting» function. For noiseless operation the value of 100 kPa should not be exceeded.

AV... adapters for TRV-valves of other manufacture

For fitting the
- thermostatic actuators RTN..
- motoric actuators SSA..
- thermal actuators STA.., STS61..
- thermal actuators STP.. (for normally open applications)

to radiator valves of other manufacture according to the following table

	AV51	AV52	AV53	AV54	AV55	AV56	AV57	AV58	AV59	AV60	AV61
											
Brand	**Beulco**	**Comap**	**Danfoss RA-2000**	**Danfoss RAVL**	**Danfoss RAV**	**Giacco-mini**	**Herz**	**Oven-trop alt**	**Vaillant**	**TA**	**MMA Markaryd**
Adapter thread	**M30x1**	**M28x1,5**					**M28x1,5**	**M30x1**		**M28x1,5**	**M28x1,5**
Remarks	[1]							[2]		[3]	

[1] Not to be used with RTN.. (distributor for floor heating systems)
[2] Oventrop has been using M30 x 1.5 since 2001, requiring no adapter
[3] TA (Heimeier) is now using M30 x 1.5, requiring no adapter

Connection (M30 x 1.5) on valves of other manufacture, without adapter
Heimeier / Junkers / Honeywell Braukmann / MNG / Cazzaniga / Oventrop M30 x 1.5 / TA-Type TBV-C / Beulco new

Refrigerant valves fitted with magnetic actuator

Improving the efficiency of refrigeration plants

The criteria applying to air conditioning and ventilation plants also apply increasingly to refrigeration plants. Quality is judged based on the efficiency of the refrigeration process under part load conditions. A disadvantage from the point of view of control is the fact that, for environmental reasons, refrigeration plants use ever smaller amounts of refrigerant, impacting the dynamics of the refrigeration process in a number of ways. Conventional control processes and analog expansion valves cannot cope anymore with this type of situation, leading to considerable control deviations especially under part load conditions. Clever chiller manufacturers have discovered the benefits offered by electronically controlled magnetic valves and use them on expansion, hot-gas and suction throttle applications.

In contrast to ready set thermostatic expansion valves, combinations of a proportional magnetic valve and a Polycool TM controller enable the evaporator's capacity to be matched to the actual demand by continuously changing the amount of superheat (large superheat = small capacity, small superheat = large capacity). This means that, at full load, the evaporator should hold as much liquid as possible, enabling it. For details please contact your local Siemens branch office.

Valves	PN class	DN	k_{vs} [m³/h]	k_{vs} reduced [m³/h]	Δp_{max} [kPa]	Positioning signal	Operating voltage	Datensheet
MVL661..	PN40	15...25	0.4...12	0.25...8	200...2500	0/2...10 V, 0/4...20 mA	AC 24 V, DC 20...30 V	N4714
MVF661..N	PN40	25	0.16...6.3	0.1...4	2500	0/2...10 V, 0/4...20 mA	AC 24 V, DC 20...30 V	N4716
M3K..FX..N	PN16	15...50	0.6...30	-	300...500	0...10 V, 4...20 mA, 0...20 V Phs	AC 24 V	N4741
M3FK..LX..	PN32	15...50	0.6...30	-	200 (Gas 800)	0...10 V, 4...20 mA, 0...20 V Phs	AC 24 V	N4722
M3FB..LX..	PN40	15...32	0.6...12	-	800...2200	0...10 V, 4...20 mA, 0...20 V Phs	AC 24 V	N4721
Pilot valve **M2FP03GX**	PN32	-	0.3	0.3	1800	0...10 V, 4...20 mA, 0...20 V Phs	AC 24 V	N4731

Select reduced k_{VS} value with DIL switch

Valve sizing and actuator selection

Tools

Slide rule

The proven valve sizing rule simplifies the selection of valves and covers standard selection processes for applications with water.

For central HVAC plants

- Valves and actuators for central HVAC plants
- Order Nr. 0-01926-EN, English
- Further languages, please contact your local Siemens branch office

For room and zone applications

- Valves and actuators for room and zone applications
- Order Nr. 0-01927-EN, English
- Further languages, please contact your local Siemens branch office

Characteristics

- Manual selection
- Straightforward handling
- Simple check Tmax, Δpmax

Easy VASP

The EasyVASP (Valve and Actuator Selection Program) from Siemens is available on CD and helps you not only with standard tasks but also with complex applications. Different types of media and valve design are supported.

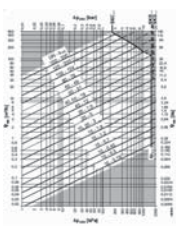
- Central HVAC plant
- Room and zone applications
- Steam applications
- Available from your local Siemens branch office
- Downloadable on www.siemens.com/acvatix

Characteristics

- Can be installed on any PC
- Easy to use
- Suited for the most types of media
- Data can be exported and printed
- CD contains datasheets

Flow diagram

All datasheet comprise the respective flow diagram for straightforward sizing and selection of valves and actuators.



- Central HVAC plant
- Room and zone applications
- Steam applications

Characteristics

- In every datasheet
- Valve-actuator combinations are listed

Valve sizing and actuator selection

Definitions

Abbreviation	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, valid for the entire actuating range of the motorized valve.
Δp_{V100}	Differential pressure at nominal flow rate	kPa	Differential pressure across the fully open valve and the valve's control path by a volume flow V_{100} .
Δp_S	Closing pressure	kPa	Maximum permissible differential pressure at which the motorized valve will close securely against the pressure (close off pressure).
Δp_{MV}	Differential pressure across variable flow path	kPa	Oftent Δp_{MV} is not known, in which case typical practical values can be used.
Δp_{VR}	Differential pressure of flow and return	kPa	
Δp_W	Effective pressure (controlled differential pressure)	kPa	
ΔT	Spread	K	Temperature differential between flow and return
DN	Nominal size		Characteristic for matching parts of the piping system
H_0	Shut-off head	m	The head generated by a pump at closed value, at a given speed of rotation and a given pump liquid.
kPa	Unit of pressure	kPa	100 kPa = 1 bar = 10 mWC
mWC	Meter water column	m	
k_V		m^3/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	m^3/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).
	Leakage rate	% k_{VS}	(H_{100}) Leakage rate when valve is fully closed (H_0) to DIN EN 1349
	Emergency positioning 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	
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 0.3 is required.
Q_{100}	Rated capacity	kW	Plant's design capacity
V_{100}	Volumetric flow	m^3/h	Volumetric flow with valve fully open (H_{100})
ν	Kinematic viscosity	mm^2/s	
c	Specific heat capacity	kJ/kgK	
ρ	Specific density	kg/m^3	

Valve sizing and actuator selection

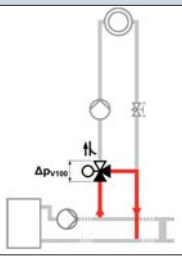
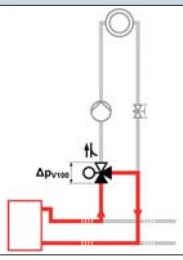
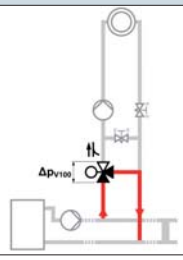
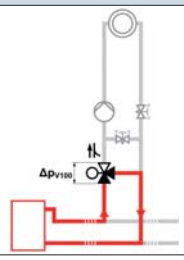
The design temperature
The design temperature is the highest (heating applications) or the lowest (cooling applications) medium temperature occurring inside the valve. When sizing valves for media other than water, note that the medium characteristics, specific heat, density and kinematic viscosity are different from those of water. All variables are dependent on the medium's temperature.

Kinematic Viscosity
In the case of kinematic viscosities ν up to 10 mm^2/s, no corrections are required. For the selection of actuating devices for kinematic viscosities ν above 10 mm^2/s, please contact your local Siemens branch office.

Valve sizing and actuator selection

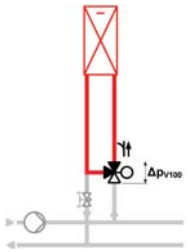
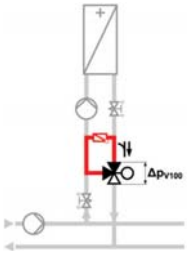
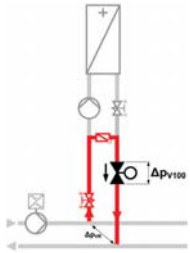
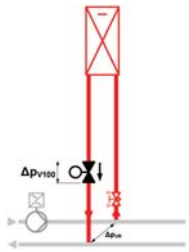
Heating plant

1 Determine differential pressure Δp_{V100}

Determine the type of hydraulic circuit ___ Differential pressure Δp_{MV} across variable flow path				
	Mixing circuit without bypass		Mixing circuit with bypass	
	With primary pump	Without primary pump	With primary pump	Without primary pump
Δp_{MV} Typical range	2 – 5 kPa	5 – 15 kPa	2 – 5 kPa	5 – 15 kPa
Typical value	3 kPa	8 kPa	3 kPa	8 kPa
Δp_{V100}	$\Delta p_{V100} > \Delta p_{MV}$			
Δp_{max}	$\Delta p_{max} > \Delta p_{V100}$			
	Determine the type of hydraulic circuit and select differential pressure Δp_{V100}			

Ventilation plant

1 Determine differential pressure Δp_{V100}

Determine the type of hydraulic circuit ___ Differential pressure Δp_{MV} across variable flow path				
	Diverting circuit	Injection circuit with 3-port valve	Injection circuit with 2-port valve	Throttling circuit
	Primary pump constant		Primary pump controlled	
Δp_{MV} Typical range	10 – 50 kPa	2 – 5 kPa		
Typical value	35 kPa	3 kPa		
Δp_{VR} Typical range			20 – 200 kPa	20 – 200 kPa
Typical value			Use effective Δp_{VR} value	
Δp_{100}	$\Delta p_{V100} > \Delta p_{MV}$		$\Delta p_{V100} \geq \frac{\Delta p_{VR}}{2}$	
Δp_{max}	$\Delta p_{max} > \Delta p_{V100}$		$\Delta p_{max} > \Delta p_{VR}$	
	Determine the type of hydraulic circuit and select differential pressure Δp_{V100}			

2 Determine volumetric flow V_{100}	Water without anti-freeze $\dot{V}_{100} = \frac{Q_{100}}{1{,}163 \cdot \Delta T}$	Water with anti-freeze $\dot{V}_{100} = \frac{Q_{100} \cdot 3600}{c \cdot \Delta T \cdot \rho}$
3 Determine the k_v-value	$k_V = \frac{\dot{V}_{100}}{\sqrt{\frac{\Delta p_{V100}}{100}}}$	
4 Select nominal flow value k_{vs}	$k_{vs} \geq 0{,}85 \cdot k_v$-value	
Resulting Δp_{V100}	$\Delta p_{V100} = 100 \cdot \left(\frac{\dot{V}_{100}}{k_{vs}}\right)^2$	
5 Select suitable valve range	a) Type of valve (2-position, 3-position, 3-position with bypass) b) Connections (flanged, threaded, solder connections)	c) Pressure class d) Nominal size DN
	Pre-select valve range(s) for suitable valve	
6 Check valve authority P_v (control stability)	$P_V = \frac{\Delta p_{V100}}{\Delta p_{V100} + \Delta p_{MV}} \geq 0.25 \ldots 0.8$ enter Δp_{V100} of step 4	$P_V = \frac{\Delta p_{V100}}{\Delta p_{VR}} \geq 0.25 \ldots 0.8$ enter Δp_{V100} of step 4
7 Check the valve's working range	a) Medium temperature b) Medium	
8 Select the actuator	Pre-select available types of actuators: a) Supply voltag b) Control signal c) Actuator positioning time	d) Spring return facility e) Auxiliary functions
9 Check the actuator's working range	Available types of actuators with: a) Differential pressure $\Delta p_{max} > \Delta p_{V100}$	b) Close pressure $\Delta p_s > H_0$
Selection	Valve and suitable actuator	

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