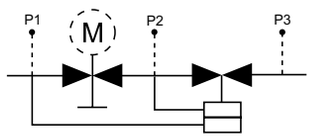
VDL 050...300: 2-way regulating valve for dynamic hydronic balancing, PN 16, Valveco flange

VDL050F601



How energy efficiency is improved

Automatic dynamic hydronic balancing with the SAUTER Valveco flanged regulating valve provides a correct supply to the downstream consumers and a reduction of temperature variations in heating and cooling systems, so that energy is used more accurately and more efficiently

Features

- Regulating valve (PICV) with three functions:
  - Regulating
  - Infinitely variable preset for maximum volume flow
  - Automatic hydronic balancing
- Control of low and mean temperature domestic hot water, cooled water, water with anti-freeze in closed circuits[1)]
- Volume flow range: 2.5…600 m^3/h
- All types with three pressure measurement nipples for precise calibration and control
- The valve is closed when the spindle is moved in
- Closing procedure against the pressure
- Simple connection of VDL 050…080 to AVM 215 and VDL 100…200 to AVM 234 (VDL 250…300 with adapter)
- Regulating valve with flange connection, flat-sealing
- Differential pressure across the control unit is kept constant
- Calculation of valve authority not required (= 1.0)

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Technical data

Parameters		
	Nominal pressure	PN 16 (EN 1333)
	Operating pressure	Max. 16 bar
	Differential pressure	Max. 800 kPa (8 bar)
	Volume flow setting range	2.5…600 m³/h (see type list)
	Flow accuracy[2)]	± 5%
	Connection	Flange as per ISO 7005-2
	Valve characteristic	Linear (VDI/VDE 2173)
	Leakage rate	Max. 0.01% of the volume flow with the valve fully open (Class IV, EN 1349)
	Control ratio	> 100:1
Ambient conditions		
	Operating temperature for valve	DN 50…DN 200: 0…120 °C DN 250…DN 300: 0…110 °C
Construction		
	Pressure measurement nipple	3 pcs, G ⅛ inch, suitable for probes max. Ø 3.2 mm Length: 25…40 mm
Standards, directives		
	Pressure and temperature data	EN 764, EN 1333
	Flow parameter	EN 60534, page 3

1) *Frost protection: Ethylene glycol or propylene glycol, maximum 50% concentration. The water quality must comply with VDI 2035.*

2) *Accuracy ±5% only when using the KV signal for volume flow measurement (in the Δp range p1 − p3 of 100… 800 kPa) and with a setpoint ≥ 1*
The accuracy is independent of the fitting position of the valve

Overview of types

Type	Nominal diameter (DN)	Volume flow range (m³/h)	Control range Δp (kPa)	Valve stroke (mm)	Weight Net (kg)	Weight Gross (kg)
VDL050F601	50	2.5…15	7…800	20	14.7	15.7
VDL050F601H	50	3.9…24	19…800	20	14.7	15.7
VDL065F601	65	4.4…25	15…800	20	19.2	20.2
VDL065F601H	65	5.9…35	30…800	20	19.2	20.2
VDL080F601	80	5.3…34	9…800	20	27.7	28.7
VDL080F601H	80	7.0…43	15…800	20	27.8	28.7
VDL100F601	100	12.1…68	10…800	40	50.2	74.8
VDL100F601H	100	14.8…90	16…800	40	50.3	74.8
VDL125F601	125	18.5…110	16…800	40	76.5	102.1
VDL125F601H	125	23.0…135	27…800	40	76.5	102.1
VDL150F601	150	25.6…148	21…800	43	111.0	135.5
VDL150F601H	150	32.0…195	33…800	43	111.0	135.5
VDL200F601	200	95.0…210	11…800	43	174.0	210.1
VDL200F601H	200	130…280	31…800	43	174.0	210.1
VDL250F601	250	190…475	10…800	48	306.0	342.4
VDL250F601H	250	245…600	15…800	48	306.0	342.4
VDL300F601	300	190…475	10…800	48	469.0	534.4
VDL300F601H	300	245…600	15…800	48	469.0	534.4

Gross weight: Shipping weight incl. packaging

Type	PED 2014/68/EU	EU declaration of conformity	Fluid group
VDL050F601(H)	PED Art. 4.3	No CE marking in accordance with PED	Fluid group II as per Article 13. (liquids only)
VDL065F601(H) … VDL200F601(H)	PED Category I	With CE marking in accordance with PED	
VDL250F601(H)	PED Art. 4.3	No CE marking in accordance with PED	
VDL300F601(H)			

Combination of VDL with electric actuators

i ***Warranty:*** *The technical data and pressure differences indicated here are applicable only in combination with SAUTER valve actuators.*

i ***Definition of Δp_s:*** *Maximum admissible pressure drop in the event of a malfunction (pipe break after the valve) at which the actuator reliably closes the valve.*

i ***Definition of Δp_{max}:*** *Maximum admissible pressure drop in control mode at which the actuator reliably opens and closes the valve.*

i ***Definition of Δp_{min}:*** *Minimum differential pressure across the control passage of the valve for the differential pressure regulator to operate reliably.*

Pressure differences

Actuator	**AVM215SF132-7**		**AVM215SF132R**	
Voltage	24 VAC/DC		24 VAC/DC	
Control signal	2-/3-point, 0...10 V		2-/3-point, 0...10 V	
Running time	7,5 / 15 s/mm switchable		7,5 / 15 s/mm switchable	
Actuating power	500 N		500 N	
Media temperature	Max. 100 °C		Max. 100 °C	
Adapter set	–		0510390038	
Closes against the pressure	Δp_{max} [bar]	Δp_s [bar]	Δp_{max} [bar]	Δp_s [bar]
VDL050F601 VDL050F601H VDL065F601 VDL065F601H VDL080F601 VDL080F601H	8.0	5.0	8.0	5.0
Cannot be used to close with the pressure				

VDL050F601(H)...VDL080F601(H) require adapter set 0510390038 for the AVM215SF132R actuator

Only use the SAUTER actuators named here, as the switch-off force is adapted to the valves

Pressure differences

Actuator	**AVM234SF132-7**		**AVM234SF132**	
Voltage	24 VAC/DC		24 VAC/DC	
Control signal	2-/3-Pt., 0…10 V, 4…20 mA		2-/3-point, 0…10 V, 4…20 mA	
Running time	2/4/6 s/mm		2/4/6 s/mm	
Actuating power	1700 N		2500 N	
Media temperature	Max. 120 °C		Max. 110 °C	
Adapter set	–		0510390053	
Closes against the pressure	Δp_{max} [bar]	Δp_s [bar]	Δp_{max} [bar]	Δp_s [bar]
VDL100F601 VDL100F601H VDL125F601 VDL125F601H VDL150F601 VDL150F601H VDL200F601 VDL200F601H	8.0	8.0	–	–
VDL250F601 VDL250F601H VDL300F601 VDL300F601H	–	–	8.0	8.0
Cannot be used to close with the pressure				

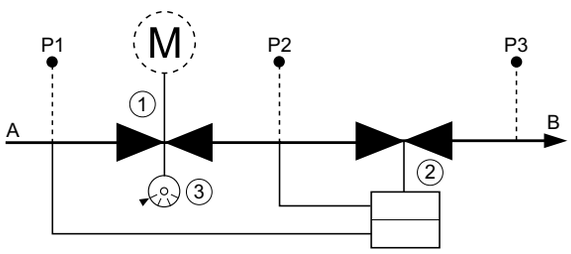
- *VDL250F601(H)...VDL300F601(H) require adapter set 0510390053 for the AVM234SF132 actuator*
- *AVM234SF132: In combination with VDL 250, 300, the media temperature is limited to a maximum of 110°C.*
- *Only use the SAUTER actuators named here, as the switch-off force is adapted to the valves*
- *DN 250 and DN 300: Due to manufacturing tolerances, it is possible that the maximum flow rate may not be reached when used in combination with the AVM234SF132 + adapter*

Description of operation

The Valveco flanged valve is a combined differential pressure controller, regulating valve and dynamic VAV controller with and adjustable maximum volume flow setting.
The dynamic mechanical differential pressure controller maintains a constant pressure across the control valve (PICV), ensuring the preset volume flow regardless of pressure fluctuations in the system.
The combination of dynamic hydronic balancing and dynamic regulation in the SAUTER Valveco simplifies the work of planning engineers and installers. No time-consuming calibration or adjustment of the systems is required. In the event of pressure fluctuations, the energy supply of the existing system remains unaffected.

Flow rate

The medium entering through the inlet (A) first flows through the regulating valve (1) with linear valve characteristic. The actuator precisely positions the regulating valve. The medium flows through the valve opening, whose cross-section is limited by the variable preset with graduated ring (3). The preset determines the maximum volume flow.
The valve remains closed if the minimum differential pressure (Δp_{min}) is not reached.
The built-in differential pressure controller (2) ensures that the volume flow remains constant through the entire control range, regardless of the input pressure P1.
The medium leaves the PICV through the outlet (B) at a constant volume flow.
When the spindle is pressed in, the regulating valve is closed.

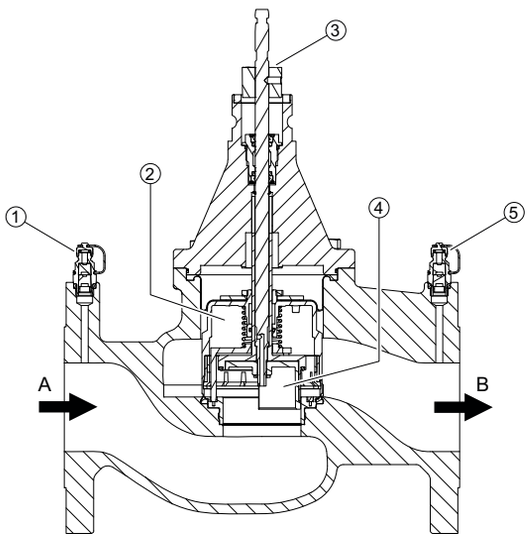


P1 Pressure measuring point (P/T), inlet A (red)
P2 Pressure measuring point (P/T), regulating valve (blue)
P3 Pressure measuring point (P/T), outlet B (blue)
A Inlet
B Outlet
(1) Regulating valve with actuator (M)
(2) Differential pressure regulator (DPR)
(3) Preset with graduated ring

Manual adjustment

Manual adjustment of the valve is only possible using the manual adjustment on the mounted actuator.

Mechanical layout
Shown in open valve position.



A Inlet
B Outlet
(1) Pressure measuring point (P/T) at inlet, red marking, P1
(2) Differential pressure regulator (DPR)
(3) Preset with graduated ring
(4) Regulating valve
(5) Pressure measuring point (P/T) at outlet, blue marking, P3

Intended use

The product is only suitable for the purpose intended by the manufacturer, as described in this product data sheet. All related product regulations must also be adhered to.
Use the VDL 050…300 exclusively as a control valve and only in combination with the actuators specified in this data sheet.
Changes or modifications are not permitted.
In cases where a failure or malfunction of the valve could result in personal injury or damage to the controlled system or other property, additional protective and warning devices must be incorporated into the system. Integrate monitoring or alarm systems, safety or limit controllers for this purpose.

Improper use

The flanged valves are not suitable for use in drinking water systems or open water circuits.
The valves may not be used in applications where they close under pressure.

Engineering and fitting notes

The VDL 050…300 is suitable for use in both the supply and return lines. When used in the return line, the diaphragm and seals are subjected to less stress, due to the lower temperatures.
No minimum straight pipe lengths are required upstream or downstream of the valve.

CAUTION!
Failure to observe safety regulations can result in physical injury and property damage.
►Observe the current local regulations and safety regulations.

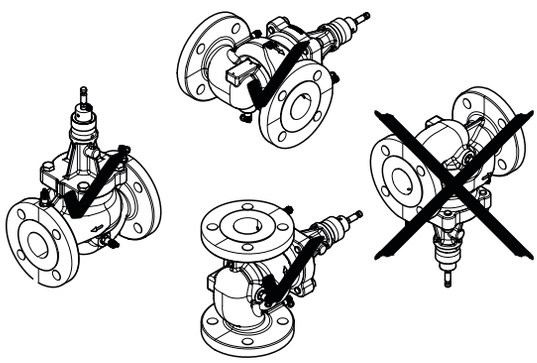
The valve, actuator and accessories must be ordered separately and are shipped individually packaged. The valves are supplied without a counterflange, without bolts and nuts and without a flange gasket.
All SAUTER Valveco valves may only be used in closed circuits, closing against the pressure. An excessively high oxygen mixture may irreparably damage the regulating valves in open water circuits.
Observe the flow direction according to the fitting instructions and the arrow on the valve body.

To minimise flow noise, the differential pressure across the valve should not exceed 150 kPa.
Only insulate the valve up to the valve neck. The actuator must not be insulated.

Note
VDL250F601(H) and VDL300F601(H):
When using the AVM234SF132 actuator in combination with adapter set 0510390053, manufacturing tolerances may prevent the valve may from opening fully.
Full closing is ensured by the actuator.

Using with water
It is recommended to install strainers, e.g. on each floor or line. This prevents the valve and the differential pressure regulator from being damaged by impurities in the water such as weld beads or rust particles.
The water quality must comply with standard VDI 2035. When using an additive in the water such as an oxygen binding agent, the compatibility of the valve materials must be checked with the manufacturer of the medium. The materials table shown below may be used.

Fitting position
Fitting in a suspended position is not permitted.



Valve design
The appropriate Valveco valve can be selected in five steps using the following formula:

$$\dot{V} = \frac{Q[kW] \cdot 1000}{1{,}163 \cdot \Delta T[K]} \left[\frac{l}{h}\right]$$

1. Determine the heating/cooling requirement (Q [kW])
2. Determine the temperature spread ΔT [K]
3. Calculate the volume flow
4. Choose the suitable Valveco valve
5. Determine the scale setting using the tables in the “Volume flow and Δp values — scale preset” section

Example:
1. Heat requirement: Q = 130 kW
2. Temperature spread: ΔT = 5 K
3. Volume flow: $\dot{v}$ = (130 kW × 1000) / (1.163[3)]× 5 K) = 22,356 l/h = 22.4 m³/h
4. Select the Valveco valve. Select the PICV so that it can be operated at 80% of the maximum flow. This way, more heating or cooling capacity can be supplied if required.
   The following are available:
   - VDL065F601 with Δp_{min}= 15 kPa
   - VDL065F601H with Δp_{min}= 30 kPa
5. Scale setting:
   - VDL065F601 with volume flow 22.4 m³/h = scale value 3.7 (interpolated)
   - VDL065F601H with volume flow 22.3 m³/h = scale value 2.8

VDL065F601H is selected because the setting for VDL065F601 is already above 80% of the maximum flow.

3) *1.163 = specific heat capacity of water at approx. 20 °C.*

Slide rule and supplementary technical documents

SAUTER slide rule for valve sizing	P100013496
Technical manual on control units	7000477001
Declaration on materials and the environment	MD 57,005
Fitting instructions:	
VDL 050…300	P100020767
AVM215SF132R and AVM215SF132-7 for VDL 050…080	P100015485
AVM234SF132-7 for VDL 100...200 AVM234SF132 for VDL 250…300 + adapter set	0505919033
Adapter set 0510390053	P100015720
Adapter set 0510390038	D100377015

Valve design
SAUTER provides various tools for valve design and engineering:
- ValveDim mobile app
- ValveDim PC program
- ValveDim slide rule

You can find the tools under the linkwww.sauter-controls.com/leistungen/ventilberechnung/
or scan the QR code

Design and materials

Valve body protected by matt paint RAL 9005 jet black.

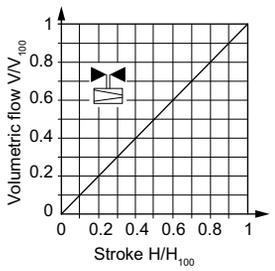
Material numbers as per DIN

	Designation
Valve body VDL 050...065	Grey cast iron (GJL-250)
Valve body VDL 080...300	Ductile cast iron (GJS-400-18RT)
Valve spindle, spring	Stainless steel
Seals/O-rings	EPDM (with silicone grease)
Controller	Stainless steel
Diaphragm	EPDM
Valve bonnet	Ductile cast iron (GJS-400-18RT)

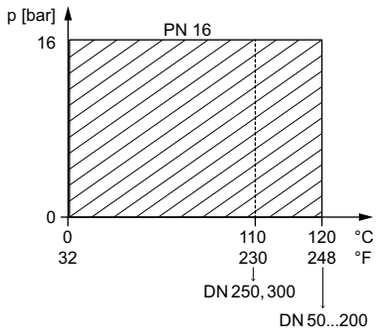
Commissioning

Before commissioning, flush dirt and residues from valves and pipelines and completely vent the piping system.
The valve may only be commissioned with the actuator mounted as specified.
The valve must be open when flushing and pressure-testing the system. Pressure surges can damage the PICV if it is closed. The valve is open when the spindle is extended (the valve is closed on delivery).
The differential pressure Δp_{max} across the control section of the valve must not exceed 800 kPa.

Valve characteristic



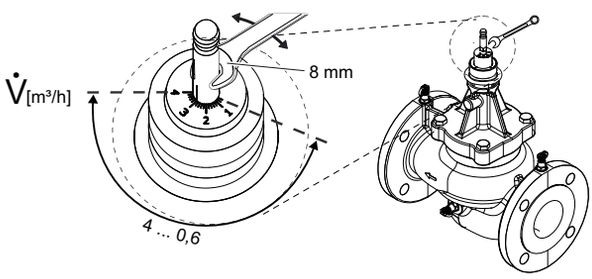
Pressure range



All VDL 50...300 have the same valve characteristic and pressure range. The valve characteristic is linear according to VDI/VDE 2173.

Volume flow and Δp values — scale preset

The set maximum volume flow ($\dot{V}$) can be read off from the symmetrical preset scale. The volume flow can be preset by turning the valve spindle with an open-end wrench (8 mm).



The scale values can be assigned to the respective volume flows using the following table. Intermediate values are interpolated and fine-adjusted with an electronic pressure gauge.
A preset up to 3.4 on the scale is ideal, because a performance reserve of approximately 20% is still available in this range.

Note
Values outside the scale shown are not specified and must not be set.

VDL050F601	Reserve area			Recommended sizing range														
Scale	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0	0.8	0.6
$\dot{v}$ [m³/h]	15.0	13.9	12.8	11.9	11.0	10.2	9.5	8.8	8.1	7.5	6.9	6.3	5.7	5.1	4.5	3.9	3.2	2.5
Δp_{min} [kPa]	20	18	16	15	13	12	11	10	9	9	8	8	7	7	7	7	7	7
Kv value [m³/h]	39.6	38.2	36.6	34.9	33.2	31.4	29.6	27.9	26.2	24.5	22.8	21.1	19.5	17.7	15.9	13.9	11.7	9.19

VDL050F601H	Reserve area			Recommended sizing range														
Scale	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0	0.8	0.6
$\dot{v}$ [m³/h]	24	22.3	20.7	19.2	17.9	16.6	15.4	14.3	13.2	12.2	11.2	10.2	9.2	8.2	7.2	6.2	5.1	3.9
Δp_{min} [kPa]	49	45	40	36	33	30	27	25	24	22	21	20	20	19	19	19	19	19
Kv value [m³/h]	39.1	38.2	37.0	35.7	34.3	32.7	31.0	29.3	27.6	25.7	23.9	22.0	20.1	18.2	16.2	14.1	11.9	9.68

VDL065F601	Reserve area			Recommended sizing range														
Scale	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0	0.8	0.6
$\dot{v}$ [m³/h]	25	23.2	21.5	19.9	18.5	17.1	15.8	14.7	13.5	12.5	11.5	10.5	9.6	8.6	7.7	6.6	5.6	4.4
Δp_{min} [kPa]	25	24	22	21	21	20	19	19	19	18	18	18	17	17	16	15	15	15
Kv value [m³/h]	54.0	52.0	49.6	47.0	44.2	41.4	38.6	35.9	33.3	30.9	28.6	26.4	24.3	22.1	19.9	17.5	14.8	11.6

VDL065F601H	Reserve area			Recommended sizing range														
Scale	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0	0.8	0.6
$\dot{v}$ [m³/h]	35.0	32.5	30.2	28.0	26.0	24.1	22.3	20.6	19.0	17.5	16.0	14.7	13.3	11.9	10.5	9.1	7.6	6.0
Δp_{min} [kPa]	55	49	44	40	37	35	34	33	32	32	32	32	32	32	31	30	30	30
Kv value [m³/h]	54.3	52.5	50.1	47.4	44.5	41.5	38.5	35.5	32.6	29.9	27.3	24.9	22.6	20.4	18.2	16.0	13.6	10.9

VDL080F601	Reserve area			Recommended sizing range														
Scale	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0	0.8	0.6
$\dot{v}$ [m³/h]	34.0	31.2	28.7	26.4	24.3	22.4	20.7	19.1	17.6	16.2	14.8	13.5	12.2	10.9	9.6	8.3	6.9	5.3
Δp_{min} [kPa]	19	17	15	13	12	11	10	10	9	9	9	9	9	9	9	9	9	9
Kv value [m³/h]	75.2	72.2	68.9	65.3	61.5	57.7	53.9	50.0	46.3	42.7	39.2	35.8	32.5	29.1	25.8	22.4	18.8	14.9

VDL080F601H	Reserve area			Recommended sizing range														
Scale	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0	0.8	0.6
$\dot{v}$ [m³/h]	43.0	39.8	36.8	34.1	31.6	29.3	27.1	25.1	23.2	21.4	19.6	18.0	16.2	14.5	12.8	11.0	9.0	7.0
Δp_{min} [kPa]	29	26	24	22	20	19	18	17	17	16	16	16	15	15	15	15	15	15
Kv value [m³/h]	75.4	73.5	70.7	67.2	63.2	59.1	54.9	50.8	46.9	43.3	39.9	36.7	33.7	30.6	27.5	24.0	19.9	15.0

VDL100F601	Reserve area			Recommended sizing range														
Scale	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0	0.8	0.6
$\dot{v}$ [m³/h]	68.0	62.0	56.7	51.9	47.7	44.0	40.6	37.6	34.9	32.4	30.0	27.8	25.5	23.2	20.8	18.1	15.3	12.1
Δp_{min} [kPa]	25	22	19	16	14	13	12	11	11	10	10	10	10	10	10	10	10	10
Kv value [m³/h]	168	156	145	134	124	114	105	96.9	89.6	83.0	77.1	71.7	66.5	61.4	56.1	50.2	43.4	35.2

VDL100F601H	Reserve area			Recommended sizing range														
Scale	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0	0.8	0.6
$\dot{v}$ [m³/h]	90.0	81.7	74.2	67.7	61.9	56.7	52.2	48.2	44.5	41.2	38.1	35.1	32.1	29.1	26.0	22.6	18.9	14.8
Δp_{min} [kPa]	45	39	34	29	25	22	19	18	16	16	16	16	16	16	16	16	16	16
Kv value [m³/h]	178	169	159	148	136	125	114	104	94.6	86.3	78.8	72.2	66.3	60.8	55.3	49.6	43.0	35.0

VDL125F601	Reserve area			Recommended sizing range														
Scale	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0	0.8	0.6
$\dot{v}$ [m³/h]	110.0	101.0	93.6	86.7	80.6	75.0	69.8	65.0	60.4	55.9	51.5	47.1	42.6	38.0	33.3	28.5	23.6	18.5
Δp_{min} [kPa]	35	30	26	24	22	21	20	19	19	18	18	18	17	17	17	16	16	16
Kv value [m³/h]	221	211	200	188	177	166	155	144	133	123	113	103	93.4	83.8	74.2	64.4	54.3	43.6

VDL125F601H	Reserve area			Recommended sizing range														
Scale	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0	0.8	0.6
$\dot{v}$ [m³/h]	135.0	125.0	116.0	108.0	101.0	94.0	87.8	82.0	76.4	70.9	65.5	60.0	54.5	48.7	42.8	36.5	29.9	23.0
Δp_{min} [kPa]	53	46	41	37	35	33	32	31	30	29	29	29	28	28	28	27	27	27
Kv value [m³/h]	223	214	204	194	183	172	161	150	139	128	118	108	97.7	87.7	77.7	67.4	56.7	45.4

VDL150F601	Reserve area			Recommended sizing range														
Scale	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0	0.8	0.6
$\dot{v}$ [m³/h]	148.0	139.0	130.0	121.0	113.0	105.0	97.5	90.3	83.4	76.8	70.4	64.1	58.0	51.8	45.6	39.2	32.6	25.6
Δp_{min} [kPa]	35	35	34	33	32	30	28	27	25	23	22	21	21	21	21	21	21	21
Kv value [m³/h]	271	263	253	243	232	221	209	197	185	173	160	147	134	121	107	92.3	77.0	60.8

VDL150F601H	Reserve area			Recommended sizing range														
Scale	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0	0.8	0.6
$\dot{v}$ [m³/h]	195.0	181.0	167.0	155.0	144.0	133.0	123.0	114.0	105.0	96.9	89.0	81.3	73.7	66.0	58.2	50.0	41.3	32.0
Δp_{min} [kPa]	65	61	57	53	49	46	43	40	38	36	34	33	33	33	33	33	33	33
Kv value [m³/h]	277	267	257	246	235	223	211	199	186	174	161	148	134	121	106	91.6	76.1	59.8

VDL200F601	Reserve area			Recommended sizing range												
Scale	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0
$\dot{v}$ [m³/h]	210	201	192	183	174	165	156	148	140	132	125	118	112	105	100	95
Δp_{min} [kPa]	32	31	29	27	26	24	22	21	19	17	16	15	13	12	12	11
Kv value [m³/h]	404	380	361	346	335	326	320	314	310	306	301	295	287	276	261	243

VDL200F601H	Reserve area			Recommended sizing range												
Scale	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0
$\dot{v}$ [m³/h]	280	267	255	243	231	220	209	199	189	179	170	161	153	145	137	130
Δp_{min} [kPa]	78	75	72	69	65	61	57	53	49	45	41	38	35	33	32	31
Kv value [m³/h]	409	384	364	348	337	328	322	317	313	310	305	299	291	280	265	245

VDL250F601	Reserve area			Recommended sizing range												
Scale	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0
$\dot{v}$ [m³/h]	475	441	412	385	361	340	321	304	288	274	260	247	233	220	205	190
Δp_{min} [kPa]	35	33	31	29	27	25	23	21	19	17	15	13	12	11	10	10
Kv value [m³/h]	699	687	672	654	634	611	587	563	538	513	490	468	448	432	418	408

VDL250F601H	Reserve area			Recommended sizing range												
Scale	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0
$\dot{v}$ [m³/h]	600	569	538	508	479	450	422	396	371	347	325	305	286	270	256	245
Δp_{min} [kPa]	70	65	60	55	50	45	40	36	32	28	25	22	20	17	16	15
Kv value [m³/h]	748	733	717	697	676	652	626	597	567	533	498	484	470	456	442	428

VDL300F601	Reserve area			Recommended sizing range												
Scale	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0
$\dot{v}$ [m³/h]	475	441	412	385	361	340	321	304	288	274	260	247	233	220	205	190
Δp_{min} [kPa]	35	33	31	29	27	25	23	21	19	17	15	13	12	11	10	10
Kv value [m³/h]	697	663	635	611	591	574	559	546	533	519	505	489	469	447	419	387

VDL300F601H	Reserve area			Recommended sizing range												
Scale	4.0	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0
$\dot{v}$ [m³/h]	600	569	538	508	479	450	422	396	371	347	325	305	286	270	256	245
Δp_{min} [kPa]	70	65	60	55	50	45	40	36	32	28	25	22	20	17	16	15
Kv value [m³/h]	746	709	677	650	627	606	588	571	554	538	521	502	481	457	429	397

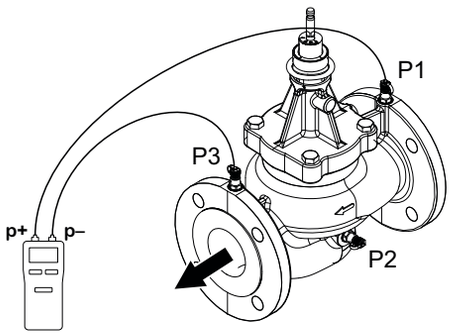
Differential pressure (Δp) measurement

The valve differential pressure is measured between the pressure measuring nipples P1 (inlet) and P3 (outlet), see figure.

The required Δp_{min} value for the desired volume flow can be found in the tables above. To ensure proper valve operation, the minimum differential pressure must be reached at all times during operation.

The pump pressure can be optimised by adjusting the minimum differential pressure. This reduces the required pump output and lowers energy consumption.

Differential pressure measurement between measuring nipples P1 and P3
Δp = p1 − p3

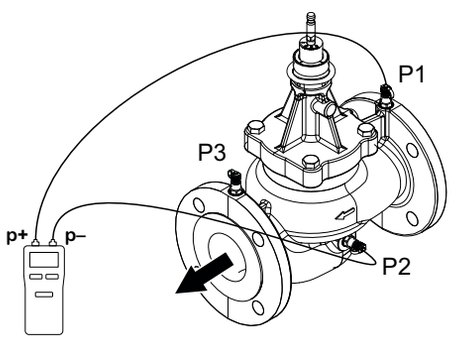


Volume flow calculation (flow verification)
To calculate the volume flow, measure the differential pressure between P1 (inlet) and P2 (regulating valve). Using the measured pressure value and the associated kV value from the tables above (valve flow coefficient), the volume flow can be calculated using the following formula:

$$\dot{V}\left[\frac{m^3}{h}\right] = K_v \cdot \sqrt{\frac{\Delta p\ [kPa]}{100}}$$

If necessary, the volume flow can be precisely adjusted on the valve spindle (using the scale).

Volume flow measurement between measuring nipples P1 and P2
Δp = p1 − p2



The measurements can be carried out using a standard electronic pressure gauge. The measuring probes must have a diameter of 2 mm to 3.2 mm and a length of 25 mm to 40 mm.

Maintenance

The VDL 050…300 does not require regular maintenance.
To prevent the valve from seizing up, the actuator should be run through a full valve stroke once a week.

WARNING!
Danger of burns due to hot surfaces. Danger of scalding from hot liquids. Before servicing or dismantling the valve or actuator:
▶De-energise the circulation pump and actuator.
▶Close the shut-off valves in the pipe network.
▶Depressurise the affected pipes and let them cool down.
▶Only disconnect electrical connections on the actuator if necessary.

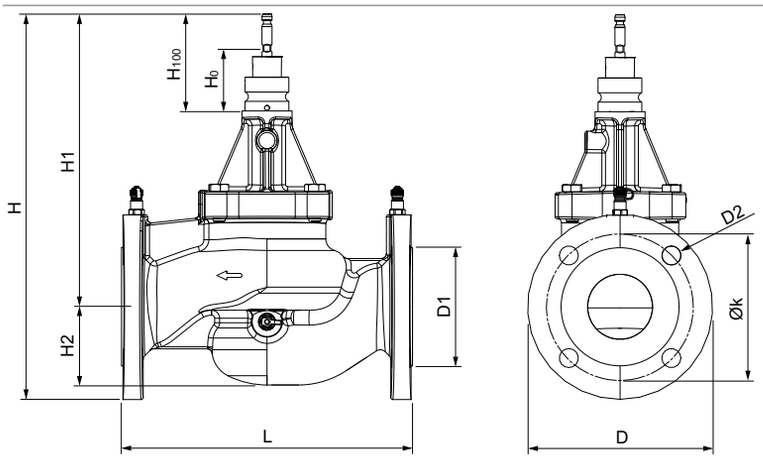
Disposal

When disposing of the product, observe the currently applicable local laws.
More information on materials can be found in the Declaration on materials and the environment for this product.

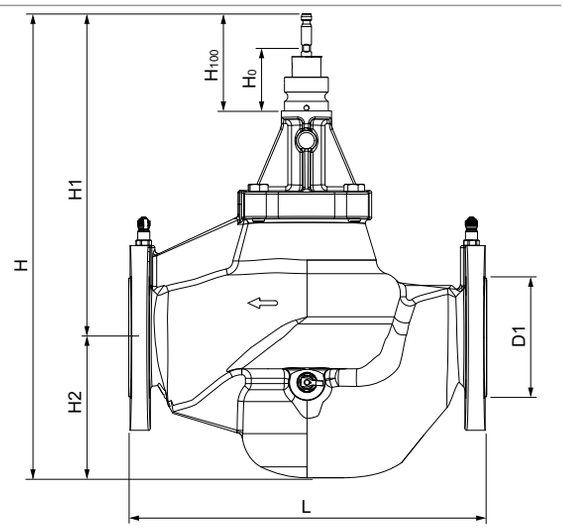
Dimension drawings

All dimensions in mm.

VDL 050…125



VDL 150…300



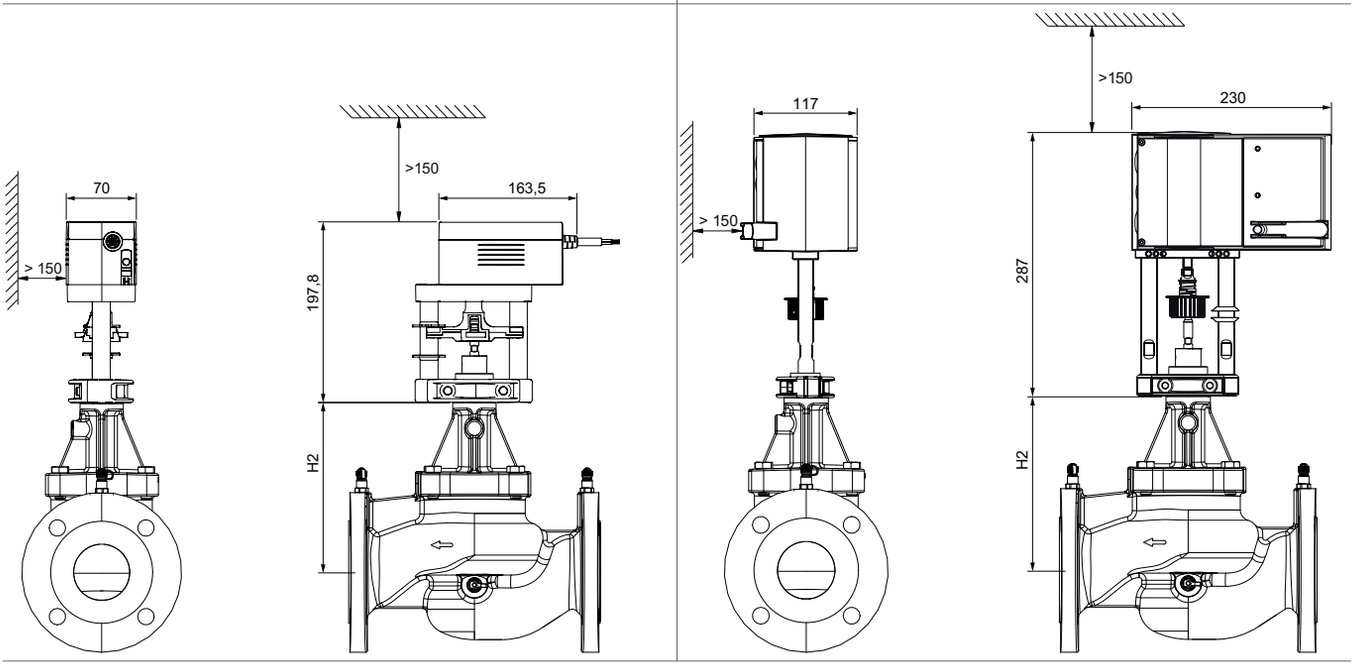
Type	H	H1	H2	H_0	H_{100}	Stroke	L	D (Ø)	D1 (Ø)	Øk	D2 (Ø)
VDL050F601	367	284.5	63.5	76.5	96.5	20	230	165	99	125	19 (4×)
VDL050F601H											
VDL065F601	384	291.5	78		96.5	20	290	185	118	145	19 (4×)
VDL065F601H											
VDL080F601	413	313	93		96.5	20	310	200	132	160	19 (8×)
VDL080F601H											
VDL100F601	566	448.5	111		116.5	40	350	235	156	180	19 (8×)
VDL100F601H											
VDL125F601	608	473	134		116.5	40	400	270	184	210	19 (8×)
VDL125F601H											
VDL150F601	676	520	155.5		119.5	43	480	285	211	240	23 (8×)
VDL150F601H											
VDL200F601	733	524	209		119.5	43	600	380	266	295	23 (12×)
VDL200F601H											
VDL250F601	914	685	229		124.5	48	730	444	318	355	28 (12×)
VDL250F601H											
VDL300F601	964	685	279		124.5	48	850	520	370	410	28 (12×)
VDL300F601H											

H/H1: Dimensions with spindle extended

H_0: Closing dimension of spindle

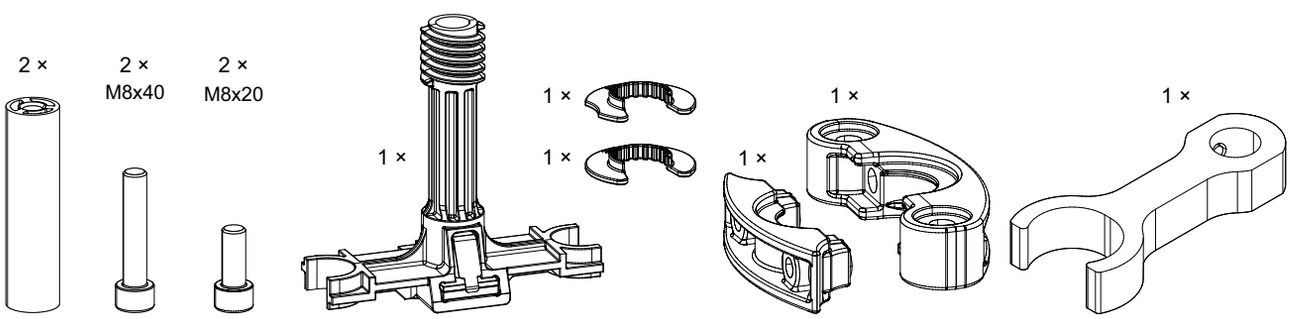
Combinations

VDL 050...080 with AVM215SF132-7 VDL 050…080 with AVM215SF132R + adapter set 0510390038 (not shown)	VDL 100...200 with AVM234SF132-7 VDL 250, 300 with AVM234SF132 + adapter set 0510390053 (not shown)

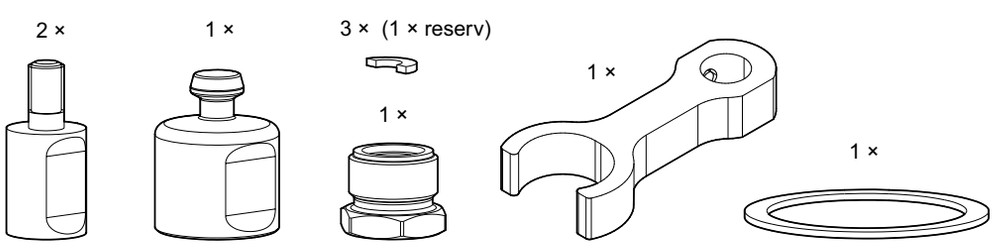


Accessories

Adapter set 0510390038



Adapter set 0510390053



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