

VDL 010...050: 2-way regulating valve for dynamic hydronic balancing, PN 25, Valveco compact

How energy efficiency is improved

Automatic dynamic hydronic balancing with the SAUTER Valveco compact regulating valve provides a correct supply to the downstream consumers and a reduction of temperature variations in the room, so that the use of energy is more accurate and more efficient

Features

- Regulating valve with three functions: Control, preset maximum volume flow, automatic flow regulation
- Range 30...11500 l/h
- Easy to preset the max. required volume flow
- Versions with and without pressure measurement nipple
- The valve is closed when the spindle is moved in
- Closing procedure against the pressure
- Slight adaptation of the proven SAUTER actuator technology
- Regulating valve with female (DN 10...DN 32) or male thread (DN 40 and DN 50) as per DIN EN ISO 228-1
- Flat-sealing regulating valve
- Differential pressure across the control unit is kept constant; valve authority 1
- Valve body and plug made of dezincification-resistant (DZR) brass
- Stainless-steel spindle
- Temperature range of medium 0...120 °C

Technical data

Parameters		
Nominal pressure		25 bar
Maximum operating pressure		PN 25
Valve characteristic		Linear
Leakage rate		0.01%

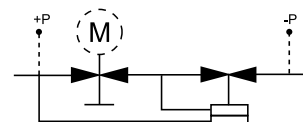
Ambient conditions	
Admissible operating temperature for valve	0...120 °C
Admissible operating temperature for valve in combination with AXT 211, AXS 215, AXM 217 (S) and AVM 215 (S)	100 °C at the valve

Standards and directives		
Pressure and temperature data		EN 764, EN 1333
Flow parameters		EN 60534, page 3

Overview of types							
Type	Nominal diameter (DN)	Volume flow range (l/h)	Control range min Δp ...max Δp (kPa)	Valve stroke (mm)	Connection / Pressure tolerance class	Pressure measurement nipple	Weight (kg)
VDL010F200	10	65...370	14...800	5	G $\frac{1}{2}$ " B	–	0.36
VDL010F201	10	65...370	14...800	5	G $\frac{1}{2}$ " B	•	0.45
VDL010F210	10	30...200	14...800	2.5	G $\frac{1}{2}$ " B	–	0.36
VDL010F211	10	30...200	14...800	2.5	G $\frac{1}{2}$ " B	•	0.45
VDL015F200	15	100...575	14...800	2.5	G $\frac{3}{4}$ " B	–	0.38
VDL015F200H	15	220...1330	8...800	5	G $\frac{3}{4}$ " B	–	0.38
VDL015F201	15	100...575	14...800	2.5	G $\frac{3}{4}$ " B	•	0.47
VDL015F210	15	65...370	14...800	5	G $\frac{3}{4}$ " B	–	0.38
VDL015F201H	15	220...1330	8...800	5	G $\frac{3}{4}$ " B	•	0.47
VDL015F211	15	65...370	14...800	5	G $\frac{3}{4}$ " B	•	0.47
VDL015F220	15	30...200	14...800	2.5	G $\frac{3}{4}$ " B	–	0.38



VDL015F210



VDL040F201



Type	Nominal diameter (DN)	Volume flow range (l/h)	Control range min Δp ...max Δp (kPa)	Valve stroke (mm)	Connection / tolerance class	Pressure measurement nipple	Weight (kg)
VDL015F221	15	30...200	14...800	2.5	G $\frac{3}{4}$ " B	•	0.47
VDL020F200	20	220...1330	15...800	5	G1" B	–	0.4
VDL020F201	20	220...1330	15...800	5	G1" B	•	0.5
VDL020F210	20	160...990	15...800	4	G1" B	–	0.4
VDL020F210H	20	300...1800	8...800	5.5	G1" B	–	0.4
VDL020F211	20	160...990	15...800	4	G1" B	•	0.5
VDL020F211H	20	300...1800	8...800	5.5	G1" B	•	0.5
VDL020F220	20	100...575	14...800	2.5	G1" B	–	0.4
VDL020F221	20	100...575	14...800	2.5	G1" B	•	0.5
VDL025F200	25	600...3609	8...800	5.5	G1 $\frac{1}{4}$ " B	–	1.02
VDL025F201	25	600...3609	8...800	5.5	G1 $\frac{1}{4}$ " B	•	1.12
VDL025F210	25	280...1800	8...800	5.5	G1 $\frac{1}{4}$ " B	–	0.51
VDL025F211	25	280...1800	8...800	5.5	G1 $\frac{1}{4}$ " B	•	0.62
VDL032F200	32	550...4001	8...800	5.5	G1 $\frac{1}{2}$ " B	–	1.17
VDL032F201	32	550...4001	8...800	5.5	G1 $\frac{1}{2}$ " B	•	1.27
VDL040F201	40	1370...9500	8...800	15	G1 $\frac{1}{2}$ " B	•	3.28
VDL050F201	50	1400...11500	8...800	15	G2" B	•	3.71

☛ Valves DN 40 and DN 50 with female thread

☛ Valves DN 10...DN 32 with male thread

Accessories

Type	Description
0378133010	1 threaded sleeve, R $\frac{3}{8}$ ", flat-sealing, with cap nut and flat seal, G $\frac{1}{2}$ - R $\frac{3}{8}$
0378133015	1 threaded sleeve, R $\frac{1}{2}$ ", flat-sealing, with cap nut and flat seal, G $\frac{3}{4}$ - R $\frac{1}{2}$
0378133020	1 threaded sleeve, R $\frac{3}{4}$ ", flat-sealing, with cap nut and flat seal, G1 - R $\frac{3}{4}$
0378134010	1 solder nipple, \varnothing 12, flat-sealing, with cap nut and flat seal, G $\frac{1}{2}$
0378134015	1 solder nipple, \varnothing 15, flat-sealing, with cap nut and flat seal, G $\frac{3}{4}$
0378134020	1 solder nipple, \varnothing 22, flat-sealing, with cap nut and flat seal, G1
0560332015	Strainer in gun metal, –10...150 °C, mesh aperture 0.5 mm, G $\frac{1}{2}$
0560332020	Strainer in gun metal, –10...150 °C, mesh aperture 0.8 mm, G $\frac{3}{4}$
0510390029	Adapter set for AVM215F***R, stroke 15 mm
0361951015	1 screw fitting for male thread with flat seal, G1 - Rp $\frac{1}{2}$
0361951020	1 screw fitting for male thread with flat seal, G1 $\frac{1}{4}$ - Rp $\frac{3}{4}$
0361951025	1 screw fitting for male thread with flat seal, G1 $\frac{1}{2}$ - Rp1
0360391040	Screw fitting incl. seal, 2 pcs. required, Rp1 $\frac{1}{2}$ - G1 $\frac{1}{2}$
0360391050	Screw fitting incl. seal, 2 pcs. required, Rp2 - G2
0560332025	Strainer in gun metal, –10...150 °C, mesh aperture 0.8 mm, G1
0560332032	Strainer in gun metal, –10...150 °C, mesh aperture 0.8 mm, G1 $\frac{1}{4}$
0560332040	Strainer in gun metal, –10...150 °C, mesh aperture 0.8 mm, G1 $\frac{1}{2}$
0560332050	Strainer in gun metal, –10...150 °C, mesh aperture 0.8 mm, G2

Combination of VDL with electrical actuators

i Warranty: The technical data and pressure differences indicated here are applicable only in combination with SAUTER valve actuators. The warranty does not apply if used with valve actuators from other manufacturers.

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 by means of a return spring.

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

Pressure differences

Actuator	AXM217F200	AXM217F202	AXM217SF402 AXM217SF404
Voltage	230 V~	24 V~/=	24 V~/=
Control signal	3-point	3-point	0/2...10 V, 0...5 V, 5...10 V, 0/4...20 mA
Running time	13 s/mm	13 s/mm	8 s/mm

 Δp [bar]

Closes against the pressure	Δp [bar]					
	Δp_{max}	Δp_s	Δp_{max}	Δp_s	Δp_{max}	Δp_s
VDL010F200						
VDL010F201						
VDL010F210						
VDL010F211						
VDL015F200						
VDL015F200H						
VDL015F201						
VDL015F210						
VDL015F201H						
VDL015F211						
VDL015F220	8.0	6.0	8.0	6.0	8.0	6.0
VDL015F221						
VDL020F200						
VDL020F201						
VDL020F210						
VDL020F210H						
VDL020F211						
VDL020F211H						
VDL020F220						
VDL020F221						
VDL025F210						
VDL025F211						
VDL025F200	8.0	8.0	8.0	8.0	8.0	8.0
VDL025F201						
VDL032F200						

Cannot be used to close with the pressure

Actuator	AXT211F110 AXT211F110M AXT211F190 AXT211HF110	AXT211F110B	AXT211F112 AXT211F112B AXT211F112M AXT211F192 AXT211HF112
Voltage	230 V~	230 V~	24 V~/=
Control signal	2-point	2-point	2-point
Running time	33 s/mm	33 s/mm	40 s/mm

 Δp [bar]

Closes against the pressure	Δp_{max}	Δp_s	Δp_{max}	Δp_s	Δp_{max}	Δp_s
VDL010F200	8.0	6.0	4.0	4.0	8.0	6.0
VDL010F201						
VDL010F210						
VDL010F211						
VDL015F200						
VDL015F201						
VDL015F210						
VDL015F211						
VDL015F220						
VDL015F221						
VDL020F200						
VDL020F201						
VDL020F210						
VDL020F211						
VDL020F220						
VDL020F221						
VDL015F200H	8.0	6.0	-	-	8.0	6.0
VDL015F201H						
VDL020F210H						
VDL020F211H						
VDL025F210						
VDL025F211						
VDL025F200	8.0	8.0	-	-	8.0	8.0
VDL025F201						
VDL032F200						

Cannot be used to close with the pressure

 In combination with VDL010F20*, VDL015F21* and VDL020F20*: The volume flow range is reduced by 10%.

Actuator	AXS215SF122 AXS215SF122B
Voltage	24 V~
Control signal	0...10 V
Running time	30 s/mm

Δp [bar]

Closes against the pressure	Δp _{max}	Δp _s
VDL010F200	8.0	6.0
VDL010F201		
VDL010F210		
VDL010F211		
VDL015F200		
VDL015F200H		
VDL015F201		
VDL015F210		
VDL015F201H		
VDL015F211		
VDL015F220		
VDL015F221		
VDL020F200		
VDL020F201		
VDL020F210		
VDL020F210H		
VDL020F211		
VDL020F211H		
VDL020F220		
VDL020F221		
VDL025F210	8.0	8.0
VDL025F211		
VDL025F200		
VDL025F201		
VDL032F200		

Cannot be used to close with the pressure

 In combination with VDL010F20*, VDL015F21* and VDL020F20*: The volume flow range is reduced by 10%.

Actuator	AVM215F120R	AVM215SF132R
Voltage	230 V~	24 V~/=
Control signal	2-/3-pt.	0...10 V
Running time	7.5 s/mm	7.5 s/mm

Δp [bar]

Closes against the pressure	Δp _{max}	Δp _s	Δp _{max}	Δp _s
VDL040F201	8.0	8.0	8.0	8.0
VDL050F201				

Cannot be used to close with the pressure

Description of operation

The regulating valve may only be used for volume flow control in closed water circuits up to PN 25.

This innovative design combines a dynamic volume flow controller (with a maximum volume flow that can be preset), a differential pressure controller and a regulating valve with electrical regulation which is independent of the set volume flow. The presetting is carried out with the actuator removed.

The dynamic controller keeps the differential pressure across the regulating valve constant, regardless of pressure fluctuations in the system. This design enables the volume flow to be automatically limited to the preset maximum value with a valve authority of 1.0.

VDL010...VDL032

When the spindle is pressed in, the regulating valve is closed. It is returned by the spring force from the spring in the valve. The valve can be moved to the OPEN or CLOSED position using the AXT211 thermal actuator for unit valves. Used in combination with the "normally closed" version of the actuator, the control passage of the valve closes in the event of a power failure.

The valve can be moved to any position using the AXS215S continuous actuator for unit valves. Depending on the position of the DIP switch, the valve is adjusted continuously with a control voltage of 0...10 V.

The valve can be moved to any position using the AXM217 motorised actuator for unit valves. For the type AXM217SF402 or AXM217SF404 (with a positioner) the valve is adjusted continuously with a control voltage of 0...10 V.

Variants:

- Direction of action 1: closes as the control voltage increases
- Direction of action 2: opens as the control voltage increases

The necessary adjustment for the valve stroke is made automatically when combined with the AXM217SF404 motorised actuator for unit valves.

The linear characteristic allows optimal control together with a continuous 0...10 V actuator.

The Valveco Compact is used for precise volume flow control in air-conditioning, cooling and heating equipment, such as fan coil units, chilled ceilings, central underfloor heating systems, air recirculation devices and plant segments in conjunction with the AXT211 thermal actuator for unit valves, the AXS215S continuous actuator for unit valves or the AXM217(S) motorised actuator for unit valves. Regulating valves of installation sizes DN 40 and DN 50 are combined with the AVM 215(S) and the related adapter set 0510390029. The assembly takes place on site.

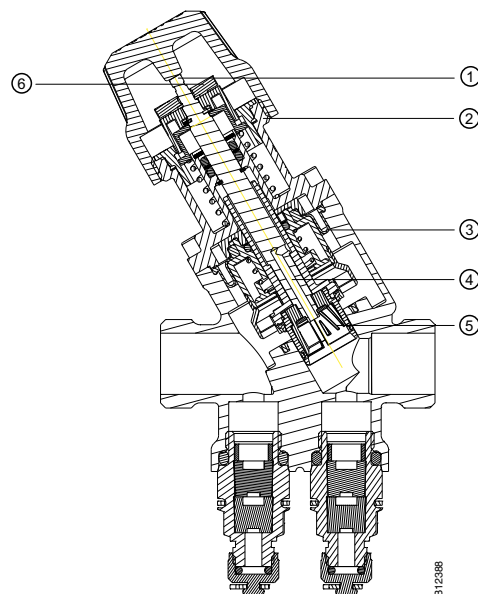
Intended use

This product is only suitable for the purpose intended by the manufacturer, as described in the "Description of operation" section.

All related product regulations must also be adhered to. Changing or converting the product is not admissible.

Additional technical data

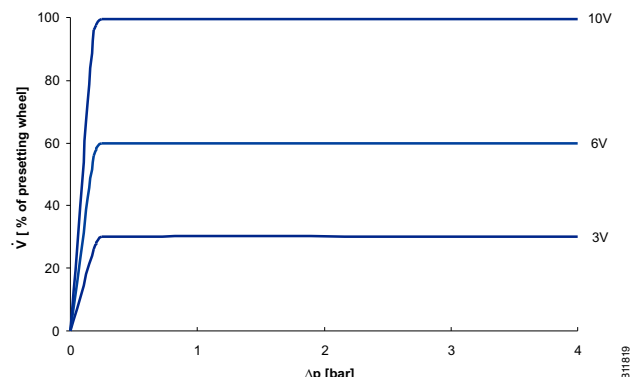
Technical manual on control units	7 000477 001
Parameters, fitting notes, control, general information	Applicable EN, DIN, AD, TRD and accident prevention regulations, as well as AD codes of practice and TRD directives
CE conformity (no CE marking for DN 10...DN 40)	PED 2014/68/EU (fluid group II, article 4.3)
CE conformity (CE marking for DN 50)	PED 2014/68/EU (fluid group II, category I)

Operating principle of the SAUTER Valveco compact regulating valve

- (1) Regulating valve unit with 2.5 mm, 4.0 mm, 5 mm or 5.5 mm of stroke
- (2) M30 × 1.5 thread for insertion of actuator
- (3) Membrane to compensate the differential pressure; keeps the differential pressure across the control unit and the preset constant
- (4) Pressure channel
- (5) Regulating unit for setting or limiting the volume flow
- (6) Preset wheel

The combination of dynamic hydronic balancing and dynamic regulation in the SAUTER Valveco compact simplifies the work of planning engineers and installers. No time-consuming initial measurement or regulation of the systems is required, and the energy supply for the existing system is not affected in the event of extensions.

Example of volume flow



Example function: DN 15 VDL015F210 with preset maximum volume flow of 370 l/h
 Volume flow as a function of the control voltage (0...10 V continuous control) and the differential pressure
 Control voltage 3 V, 6 V and 10 V

Design benefits

- Minimal labour time is needed in order to specify the components for hydronic balancing (only the volume flow data is needed)
- The valve authority does not have to be calculated
- Less energy is consumed because the design volume flow is guaranteed
- Maximum flexibility whenever changes have to be made to the system

Installation benefits

- No additional regulating valves are required for the consumer in question
- Total number of valves required is reduced due to the multi-function capability
- Reduced labour time; no initial regulation; simple and accurate method of presetting the volume flow
- Differential pressure measurement is possible
- Built-in shut-off function

Operating benefits

- Constant high level of comfort for end users thanks to precise volume flow control
- Pressure variations in the system are compensated by the differential pressure controller (disturbance value: input pressure); this substantially reduces temperature variations in the controlled room/area (reduced energy consumption).
 Secondary effect: The required running times of the actuator are reduced, thereby prolonging the actuator's serviceable life.
- With a preset valve, the full valve stroke is available; therefore, control is accurate in the control range up to 800 kPa over the valve.

Engineering and fitting notes

So that impurities are retained in the water (e.g. weld beads, rust particles, etc.) and the differential pressure controller is not damaged, dirt filters must be fitted (e.g. on each floor or pipe run) (see accessories; observe the temperature range and the application, depending on the type). Requirements for water quality as per VDI 2035.

All SAUTER Valveco compact valves must only be used in closed circuits. An excessively high oxygen mixture may destroy the regulating valves in open circuits. To avoid this, an oxygen binding agent must be used; compatibility must be clarified with the manufacturer regarding corrosion. The material list shown below may be used here.

The fittings are usually insulated in the systems. However, note that no insulation is to be applied up to the actuator housing.

To prevent any disturbing flow noise from being audible in quiet rooms, the pressure difference over the regulating valve must not exceed 70% of the indicated maximum values.

In order to prevent the valve from jamming, the controller should command the actuator to perform a full valve stroke once a week.

Further information

Fitting instructions	MV P100004091
Assembly of AXT 211	MV P100002547
Assembly of AXS 215S	MV P100002547
Assembly of AXM 217/217S	MV P100000986
Assembly of AVM 215	MV P100016873
Declaration on materials and the environment	MD 57.003

Additional version information

Valve body of dezincification-resistant (DZR) moulded brass with cylindrical male thread as per ISO 228/1, class B, flat seal on body. Stuffing box with O-ring made of EPDM (ethylene propylene).

Material numbers as per DIN (VDL 010...032)

	DIN material no.
Valve body	CW 602 N
Valve seat	CW 602 N
Pressure control plug	PPS
Guide plug	CW 602 N
Cap	PC ABS

Material number as per DIN (VDL 040...050)

	DIN material no.
Valve body	GJS-400
Valve seat	CW 602 N
Spindle	1.4301
Pressure control plug	PPS
Guide plug	CW 602 N
Spindle seal	EPDM

Using with water

When using water mixed with glycol or an inhibitor, the compatibility of the materials and seals used in the regulating valve should be clarified with the additive manufacturer in order to ensure compatibility. The material list shown below may be used here. When glycol is used, we recommend using a concentration of between 20% and 50%.

Fitting position

The control unit can be fitted in any position, but the hanging position is not admissible. Condensate, drops of water, etc. must be prevented from entering the actuator.

Installation and setting

The SAUTER Valveco compact is supplied with a protective cap. Rotate the protective cap to change the stroke position of the control unit; this allows the full volume flow through the valve before the actuator for unit valves is fitted. The valve is open when the spindle is moved out.

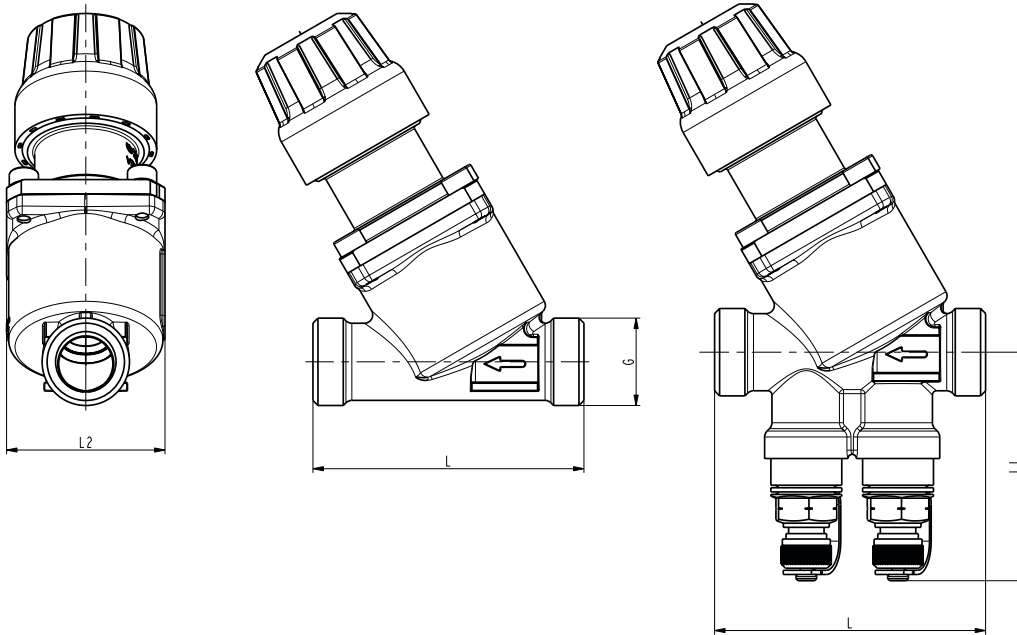
The maximum design volume flow can be set before the actuator is fitted, using the preset scale located at the top of the valve. A conversion table is required (see diagram in the Fitting Instructions).

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 drawing



DN	L [mm]	L1 [mm]	L2 [mm]
10	65	57	38
15	65	57	38
20	70	57	38
25	104	63	63
32	104	68	63
40	138	71	90
50	138	77	90