

Valveco compact: 2-way regulating valve for dynamic hydronic balancing

How energy efficiency is improved

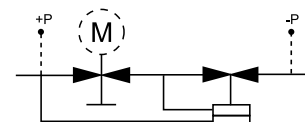
Automatic dynamic hydronic balancing with the SAUTER Valveco compact regulating valve provides correct supply to the consumers and a reduction of temperature variations in the room, so that the use of energy is more accurate and more efficient.

Features

- Regulating valve with three functions: Control, preset maximum volume, automatic flow regulation
- Range 30...1330 l/h
- Easy to preset the max. required volume flow
- Control range 14/15...400 kPa = max. Δp over the valve
- Versions with and without pressure measurement nipple
- The valve is closed when the spindle is moved in
- Closing against the pressure
- Slight adaptation of the proven SAUTER actuator technology
- Regulating valve with male thread 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



VDL015F210



Technical data

Parameters		
Nominal pressure	25 bar	
Maximum operating pressure	25 bar	
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 and AXM 217 (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 measurement nipple	Weight (kg)
VDL010F200	10	65...370	14...400	5	G½" B	–	0.36
VDL010F201	10	65...370	14...400	5	G½" B	•	0.45
VDL010F210	10	30...200	14...400	2.5	G½" B	–	0.36
VDL010F211	10	30...200	14...400	2.5	G½" B	•	0.45
VDL015F200	15	100...575	14...400	2.5	G¾" B	–	0.38
VDL015F201	15	100...575	14...400	2.5	G¾" B	•	0.47
VDL015F210	15	65...370	14...400	5	G¾" B	–	0.38
VDL015F211	15	65...370	14...400	5	G¾" B	•	0.47
VDL015F220	15	30...200	14...400	2.5	G¾" B	–	0.38
VDL015F221	15	30...200	14...400	2.5	G¾" B	•	0.47
VDL020F200	20	220...1330	15...400	5	G1" B	–	0.4
VDL020F201	20	220...1330	15...400	5	G1" B	•	0.5
VDL020F210	20	160...990	15...400	4	G1" B	–	0.4



Type	Nominal diameter (DN)	Volume flow range (l/h)	Control range min $\Delta p_{\dots max}$ Δp (kPa)	Valve stroke (mm)	Connection	Pressure measurement nipple	Weight (kg)
VDL020F211	20	160...990	15...400	4	G1" B	•	0.5
VDL020F220	20	100...575	14...400	2.5	G1" B	–	0.4
VDL020F221	20	100...575	14...400	2.5	G1" B	•	0.5

Accessories

Type	Description
0378133010	1 threaded sleeve, R $\frac{3}{8}$ ", flat-sealing, DN 10, with cap nut and flat seal
0378133015	1 threaded sleeve, R $\frac{1}{2}$ ", flat-sealing, DN 15, with cap nut and flat seal
0378133020	1 threaded sleeve, R $\frac{3}{4}$ ", flat-sealing, DN 20, with cap nut and flat seal
0378134010	1 solder nipple, Ø 12, flat-sealing, DN 10, with cap nut and flat seal
0378134015	1 solder nipple, Ø 15, flat-sealing, DN 15, with cap nut and flat seal
0378134020	1 solder nipple, Ø 22, flat-sealing, DN 20, with cap nut and flat seal
0560332015	Strainer in gun metal, –10...150 °C, mesh aperture 0.5 mm, DN 15
0560332020	Strainer in gun metal, –10...150 °C, mesh aperture 0.8 mm, DN 20

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
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_{max}	Δp_{max}	Δp_{max}
VDL010F200	4.0	4.0	4.0
VDL010F201			
VDL010F210			
VDL010F211			
VDL015F200			
VDL015F201			
VDL015F210			
VDL015F211			
VDL015F220			
VDL015F221			
VDL020F200			
VDL020F201			
VDL020F210			
VDL020F211			
VDL020F220			
VDL020F221			

Cannot be used to close with the pressure

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

 Δp [bar]

Closes against the pressure	Δp_{\max}	Δp_s	Δp_{\max}	Δp_s
VDL010F200	4.0	4.0	4.0	4.0
VDL010F201				
VDL010F210				
VDL010F211				
VDL015F200				
VDL015F201				
VDL015F210				
VDL015F211				
VDL015F220				
VDL015F221				
VDL020F200				
VDL020F201				
VDL020F210				
VDL020F211				
VDL020F220				
VDL020F221				

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	4.0	4.0
VDL010F201		
VDL010F210		
VDL010F211		
VDL015F200		
VDL015F201		
VDL015F210		
VDL015F211		
VDL015F220		
VDL015F221		
VDL020F200		
VDL020F201		
VDL020F210		
VDL020F211		
VDL020F220		
VDL020F221		

Cannot be used to close with the pressure

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

Description of operation

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 controlled to the OPEN or CLOSED positions with 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. With the AXM217SF402 (with 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 linear characteristic allows optimal control together with a continuous 0...10 V actuator.

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. Thanks to this design, the volume flow is automatically limited to the preset maximum value with 100 per cent valve authority.

This multi-function valve is used for precise volume flow control for air-conditioning, cooling and heating equipment, such as fan coil units, chilled ceilings, central underfloor heating systems, air recirculation devices and plant sections, 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.

Intended use

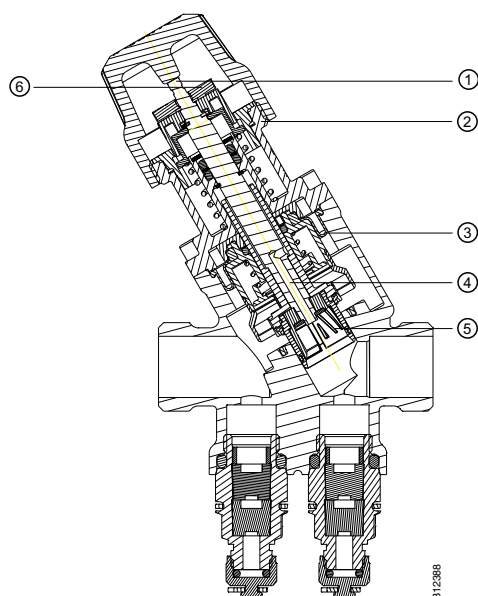
This product is only suitable for the purpose intended by the manufacturer, as described in the "Description of operation" section.

All related product documents 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 UVV regulations, as well as AD codes of practice and TRD directives
Declaration of conformity (no CE identification)	As per PED 97/23/EC (fluid group II) Article 3.3

Operating principle of the SAUTER Valveco compact regulating valve



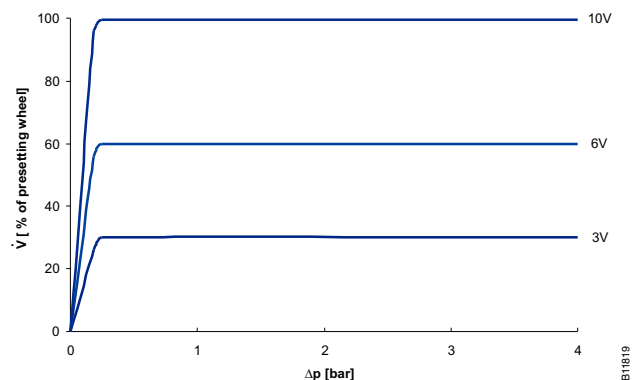
Key

1	Regulating valve unit with 2.5 mm, 4.0 mm or 5 mm of stroke
2	Thread, M30 × 1.5, to accommodate the actuator

3	Membrane to compensate the differential pressure; keeps the differential pressure across the control unit and the preset
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 max. volume flow 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 controller 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 are reduced, thereby prolonging the actuator's service life.
- With a preset valve, the full valve stroke is available; therefore, control is accurate up to 400 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 should be used in closed circuits only. An excessively high oxygen mixture may damage 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 plants. 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 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
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

	DIN material no.	DIN designation
Valve body	CW 602 N	Cu Zn 36 Pb2 As
Valve seat	PES	
Spindle	1.4305	X 12 Cr Ni S 18-8
Plug	PA/PES	
Spindle seal	PTFE	
Stuffing box	CW 602 N	Cu Zn 36 Pb2 As

Using with water

When using water mixed with glycol or an inhibitor, the compatibility of the materials and seals used in the control 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.

Mounting 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.

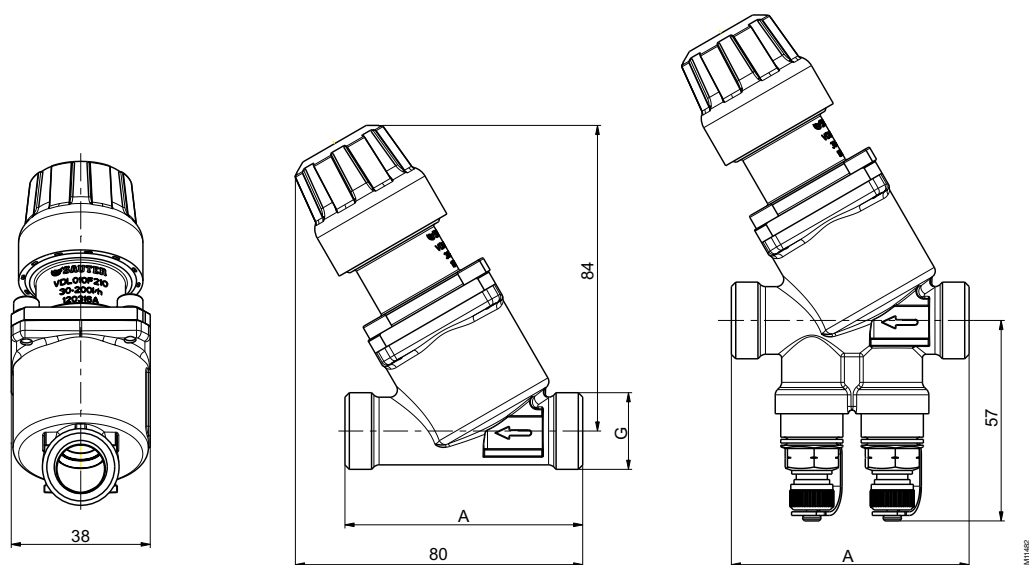
The maximum design volume flow can be set before the actuator is fitted, using the preset scale located at the top of the valve. A conversion table is required (see diagram in the Fitting Instructions).

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	G	A
10	G ½ B	65
15	G ¾ B	65
20	G 1 B	70