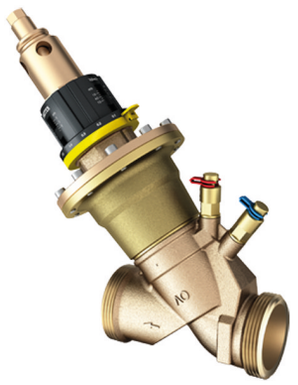
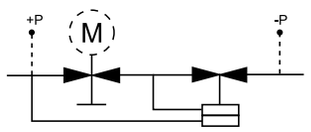
VCL 040…050: 2-way regulating valve for dynamic hydronic balancing, PN 16, Valveco



VCL040F200



How energy efficiency is improved

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

Areas of use

This multi-function valve is used to control the volume flow accurately in air-conditioning, cooling and heating equipment, such as fan coil units, chilled ceilings, central underfloor heating systems, air re-circulation devices and segments of installations in conjunction with the AVM115F901 and AVM115SF901 actuators.

Features

- Regulating valve with three functions: Control, preset maximum volume flow, automatic flow regulation
- Large volume flow range: 1500…10000 l/h
- Simple presetting of maximum volume flow without dismantling the actuator
- Control range 20…400 kPa = max. Δp over the valve
- Pressure measurement nipple on valve (for optimising)
- When the spindle is moved out, the valve is closed
- Closing procedure against the pressure
- Stuffing box can be replaced under system 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 made of gunmetal
- Plug made of dezincification-resistant (DZR) brass
- Spindle made of DZR
- Seal: PTFE, EPDM

Technical data

Parameters		
	Nominal pressure	PN 16
	Maximum operating pressure	16 bar
	Control range Δp	20...400 (kPa)
	Valve characteristic	Linear
	Valve stroke	Max. 10.0 mm
	Leakage rate in % of K_{VS}	0.01 %
Ambient conditions		
	Admissible operating temperature for valve	0...120 °C
Interfaces and communication		
	Connection	G2¼" B

Overview of types

Type	Nominal diameter	Volume flow setting range	Weight
VCL040F200	DN 40	1500...7500 l/h	5.7 kg
VCL050F200	DN 50	2500...10000 l/h	6.4 kg

Accessories

Type	Description
0361951040	1 screw fitting for male thread with flat seal, DN 40
0361951050	1 screw fitting for male thread with flat seal, DN 50
0560332040	Strainer in gun metal, –10…150 °C, mesh aperture 0.8 mm, DN 40
0560332050	Strainer in gun metal, –10…150 °C, mesh aperture 0.8 mm, DN 50

Combination of VCL with electrical actuators

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.

***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.*

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

Pressure differences

Actuator	AVM115F901	AVM115SF901
Voltage	230 V~	24 V~
Control signal	2-/3-point	2-/3-point, 0...10 V
Running time	160 s	80/160 s

Δp [bar]

Closes against the pressure	Δp_{max}	Δp_{max}
VCL040F200 VCL050F200	4.0	4.0
Cannot be used to close with the pressure		

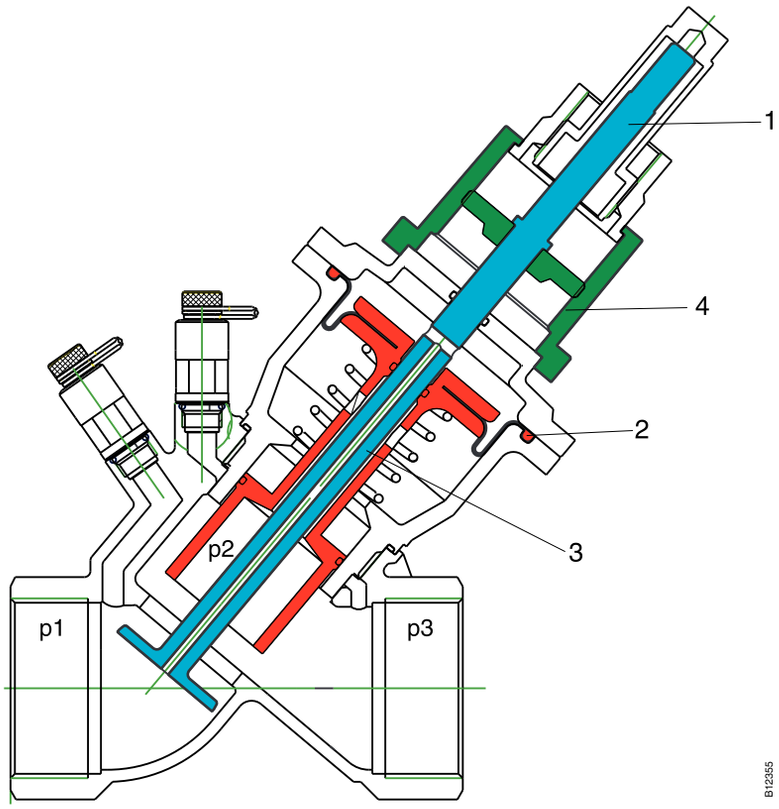
Description of operation

When the spindle is moved out, the valve is closed. The valve can be controlled with the AVM115F901 and AVM115SF901 valve actuators.
The mode of operation (valve opens or closes as the control voltage increases) can be set directly on the valve actuator by changing the terminal assignment.
The linear characteristic allows optimal control together with a continuous 0...10 V actuator.
The valve can be continuously set in any position using the SUT AVM115SF901 valve actuators with a control voltage of 0…10 V.
This innovative design combines a dynamic VAV controller (with a maximum volume flow that can be preset), an internal differential pressure controller and a regulating valve with electrical regulation that is independent of the set volume flow. Presetting is also possible with the actuator fitted.
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.

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.

Operating principle of the SAUTER Valveco regulating valve

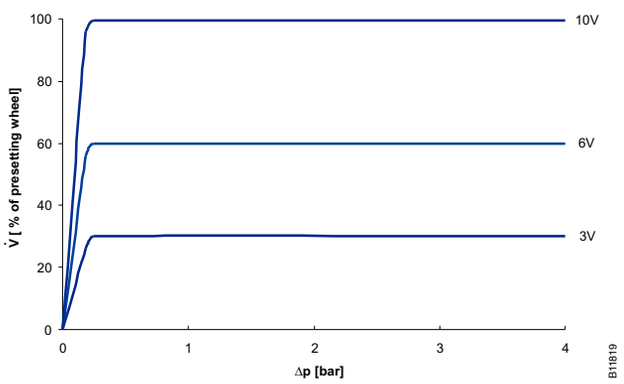


Key

1	Regulating unit for compensating the differential pressure
2	Membrane for compensating the differential pressure with compensation mechanism. Keeps the differential pressure constant across the control unit and the preset
3	Pressure channel
4	Regulating unit for setting or restricting the volume flow

The combination of dynamic hydronic balancing and dynamic regulation in the SAUTER Valveco 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.

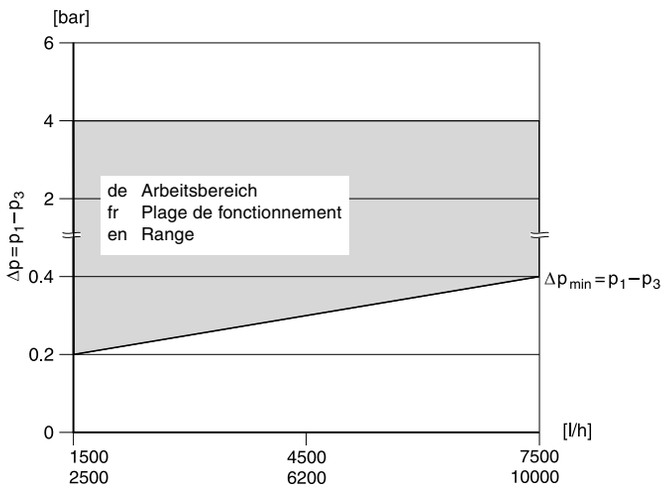
Example of volume flow



Example function: DN 40 VCL040F200 with preset max. volume flow 7500 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

Minimum pressure difference

DN40 / DN50



The required minimum differential pressure (min. Δp) over the valve can be found in the diagram. The system can be set to this value precisely using the two pressure measurement nipples.

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
- The set volume flow value can be secured by applying a local seal

Operating benefits

- Constant high level of comfort for end users thanks to high-precision 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.
- The control range is always precisely regulated 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 valves must be used in closed circuits only. An excessively high oxygen mixture can 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.

To prevent damage resulting from non-usage, the valves should be activated for a short time at regular intervals. We recommend performing a stroke movement of at least 10% every month.
To increase the functional reliability of the valves, the system should conform to DIN EN 14336 (heating systems in buildings). DIN EN 14336 states, amongst other things, that the system has to be flushed through before being put into service.

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 maximum design volume flow can be set both before and after the actuator is fitted, using the preset scale located at the top of the valve. No conversion table is required. The scale on the preset wheel indicates a recommended value for the flow rate (× 10 l/h or × 0.1 m³/h).
The installer can secure the set maximum volume flow by affixing a seal.

Additional technical data

Technical information	
Pressure and temperature data	EN 764, EN 1333
Flow parameters	EN 60534, page 3
Technical manual on control units	7000477001
Parameters, fitting notes, control, general information	Applicable regulations as per EN, DIN and accident prevention regulations, plus AD codes of practice and TRD guidelines
CE conformity (no CE marking)	As per Pressure Equipment Directive 2014/68/EU, Article 4.3 for fluid group II

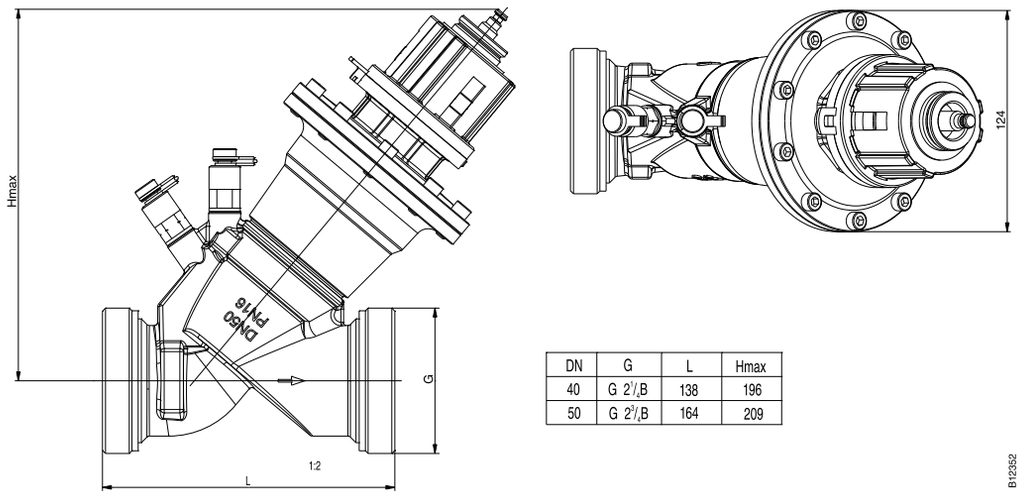
Additional version information

Valve body made of gunmetal 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 designations

	DIN material no.	DIN designation
Valve body	CB 499 K	Cu Sn5 Zn5 Pb2-C-GS
Valve seat	CB 499 K	Cu Sn5 Zn5 Pb2-C-GS
Spindle	CW 602 N	Cu Zn 36 Pb2 As
Plug	CW 602 N	Cu Zn 36 Pb2 As
Spindle seal	PTFE	
Stuffing box	CW 602 N	Cu Zn 36 Pb2 As

Dimension drawing



DN	G	L	Hmax
40	G 2 A,B	138	196
50	G 2 A,B	164	209

Accessories

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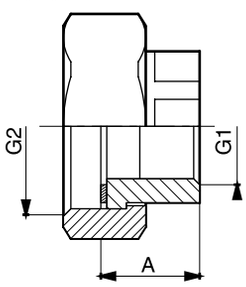

DN	A	G1	G2
15	19.00	Rp 1/2	G 1
20	21.20	Rp 3/4	G 1 1/4
25	25.40	Rp 1	G 1 1/2
32	26.20	Rp 1 1/4	G 2
40	33	Rp 1 1/2	G 2 1/4
50	32.3	Rp 2	G 2 3/4

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