

## 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 supplies downstream consumers correctly and reduces temperature variations in the room so that energy is used more accurately and more efficiently

### Features

- Dynamic volume flow control in closed water circuits in conjunction with AXF 217S, AXM 217(S), AXS 315S and AXT 301, 311 actuators for unit valves
- Volume flow range 30...11,500 l/h
- Simple presetting of maximum required volume flow
- Automatic flow regulation
- Versions with and without pressure measurement nipple
- The valve is closed when the spindle is moved in
- Closes against the pressure
- Differential pressure across the control unit is kept constant; valve authority 1
- Slight adaptation of the proven SAUTER actuator technology
- VDL 010...032: Valve with male thread, flat-sealing.  
Valve body and plug made of dezincification-resistant (DZR) brass
- VDL 040 and 050: Valve with female thread.  
Valve body made of cast iron with spheroidal graphite (GJS-400)
- Spindle made of stainless steel
- Media temperature range: 0...120°C

### Technical data

Parameters	
Nominal pressure	PN 25
Operating pressure	Max. 25 bar (up to 120 °C)
Operating temperature	0...120 °C
Valve characteristic	Linear
Leakage rate	0.01%

Ambient conditions	
Operating temperature at valve	Max. 100 °C in combination with AXF 217S, AXM 217(S), AVM 215(S), AXS 315S and AXT 301, 311

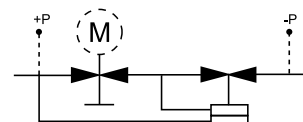
Standards, directives	
Pressure and temperature data	EN 764, EN 1333
Flow parameter	EN 60534, page 3
PED 2014/68/EU	Fluid group II DN 10...DN 40: no CE label (article 4.3) DN 50: with CE label (category I)

### Overview of types

Type	Nominal diameter (DN)	Volume flow range (l/h)	Control range min $\Delta p$ ...max $\Delta p$ (kPa)	Valve stroke (mm)	Connection / Pressure tolerance class	Pressure measurement nipple	Weight (kg)
VDL010F200	10	65...370	14...800	5	G½" B	-	0.36
VDL010F201	10	65...370	14...800	5	G½" B	•	0.45
VDL010F210	10	30...200	14...800	2.5	G½" B	-	0.36
VDL010F211	10	30...200	14...800	2.5	G½" B	•	0.45
VDL015F200	15	100...575	14...800	2.5	G¾" B	-	0.38
VDL015F200H	15	220...1330	8...800	5	G¾" B	-	0.38
VDL015F201	15	100...575	14...800	2.5	G¾" B	•	0.47
VDL015F210	15	65...370	14...800	5	G¾" B	-	0.38



VDL015F210



VDL040F201



ValveDim app



Type	Nominal diameter (DN)	Volume flow range (l/h)	Control range min $\Delta p$ ...max $\Delta p$ (kPa)	Valve stroke (mm)	Connection / tolerance class	Pressure measurement nipple	Weight (kg)
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
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...11,500	8...800	15	G2" B	•	3.71

☛ DN 10...DN 32 valves with male thread  
DN 40 and DN 50 valves with female thread

#### Accessories

Type	Description
0378133010	Threaded sleeve, R $\frac{3}{8}$ , flat-sealing, with cap nut and flat seal, G $\frac{1}{2}$ - R $\frac{3}{8}$
0378133015	Threaded sleeve, R $\frac{1}{2}$ , flat-sealing, with cap nut and flat seal, G $\frac{3}{4}$ - R $\frac{1}{2}$
0378133020	Threaded sleeve, R $\frac{3}{4}$ , flat-sealing, with cap nut and flat seal, G1 - R $\frac{3}{4}$
0378134010	Solder nipple, $\varnothing$ 12, flat-sealing, with cap nut and flat seal, G $\frac{1}{2}$
0378134015	Solder nipple, $\varnothing$ 15, flat-sealing, with cap nut and flat seal, G $\frac{3}{4}$
0378134020	Solder nipple, $\varnothing$ 22, flat-sealing, with cap nut and flat seal, G1
0361951015	Screw fitting for male thread with flat seal, G1 - Rp $\frac{1}{2}$
0361951020	Screw fitting for male thread with flat seal, G1 $\frac{1}{4}$ - Rp $\frac{3}{4}$
0361951025	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
0510390029	Mounting set for SAUTER VDL valves with 15 mm stroke, thread DN 40 and DN 50 for AVM215(S)F***R
0560332015	Strainer in gun metal (bronze), -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
0560332025	Strainer in gun metal (bronze), -10...150 °C, mesh aperture 0.8 mm, DN 25
0560332032	Strainer in gun metal, -10...150 °C, mesh aperture 0.8 mm, DN 32
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 VDL with electric actuators

- i Warranty:** The technical data and pressure differences indicated here are applicable only in combination with SAUTER valve actuators. Any warranty will be invalidated if used with valve actuators from other manufacturers.
- i Definition of  $\Delta p_s$ :** 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  $\Delta p_{max}$ :** Maximum admissible pressure drop in control mode at which the actuator reliably opens and closes the valve.

### Pressure differences with motorised actuators

Actuator	AXF217SF404 AXF217SF405 AXM217SF402 AXM217SF404		AXM217F200		AXM217F202	
Voltage	24 VAC/DC		230 VAC		24 VAC/DC	
Control signal	0/2...10 V, 0...5 V, 5...10 V, 0/4...20 mA		2-/3-point		2-/3-point	
Running time	8 s/mm		13 s/mm		13 s/mm	
Closes against the pressure	$\Delta p_{max}$ [bar]	$\Delta p_s$ [bar]	$\Delta p_{max}$ [bar]	$\Delta p_s$ [bar]	$\Delta p_{max}$ [bar]	$\Delta p_s$ [bar]
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						
VDL032F201						
Cannot be used to close with the pressure						

Actuator	AVM215F120R		AVM215SF132R	
Voltage	230 VAC		24 VAC/DC	
Control signal	2-/3-pt.		0...10 V	
Running time	7.5 s/mm		7.5 s/mm	
Closes against the pressure	$\Delta p_{max}$ [bar]	$\Delta p_s$ [bar]	$\Delta p_{max}$ [bar]	$\Delta p_s$ [bar]
VDL040F201	8.0	8.0	8.0	8.0
VDL050F201				
Cannot be used to close with the pressure				

- i** In combination with AXT301HF110, the following valves only open up to approx. 60%, including a closing safety tolerance of 0.8 mm: VDL010F20\*, VDL015F21\*, VDL015F20\*H, VDL020F20\*, VDL020F21\*, VDL020F21\*H, VDL025F20\*, VDL025F21\*, VDL032F20\*
- i** VDL with valve stroke  $\geq 5$  mm in combination with AXT 301 require adapter VA 41 (accessory 0550389K010/set of 5).

## Pressure differences with thermal actuators

Actuator	AXT301F100 AXT301F110		AXT301F102 AXT301F112		AXT301HF110		AXT301HF112	
	$\Delta p_{\max}$ [bar]	$\Delta p_s$ [bar]	$\Delta p_{\max}$ [bar]	$\Delta p_s$ [bar]	$\Delta p_{\max}$ [bar]	$\Delta p_s$ [bar]	$\Delta p_{\max}$ [bar]	$\Delta p_s$ [bar]
Voltage	230 VAC		24 VAC/DC		230 VAC		24 VAC/DC	
Control signal	2-point		2-point		2-point		2-point	
Running time	48 s/mm		48 s/mm		52 s/mm		52 s/mm	
Closes against the pressure	$\Delta p_{\max}$ [bar]	$\Delta p_s$ [bar]	$\Delta p_{\max}$ [bar]	$\Delta p_s$ [bar]	$\Delta p_{\max}$ [bar]	$\Delta p_s$ [bar]	$\Delta p_{\max}$ [bar]	$\Delta p_s$ [bar]
VDL010F200								
VDL010F201								
VDL010F210								
VDL010F211								
VDL015F200								
VDL015F200H								
VDL015F201								
VDL015F210								
VDL015F201H								
VDL015F211								
VDL015F220	8.0	6.0	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	6.0	8.0	6.0
VDL025F201								
VDL032F200								
VDL032F201								
Cannot be used to close with the pressure								

- i** In combination with AXT311F11\*, the white spindle extension must be removed from the following valves before fitting: VDL010F20\*, VDL015F21\*, VDL015F20\*H, VDL020F20\*, VDL020F21\*H, VDL025F20\*, VDL025F21\*, VDL032F20\*

Pressure differences with thermal continuous actuators

Actuator	AXS315SF102		AXS315SF202		AXT311F110		AXT311F112	
Voltage	24 VAC/DC		24 VAC/DC		230 VAC		24 VAC/DC	
Control signal	0...10 V		0...10 V		2-point		2-point	
Running time	30 s/mm		30 s/mm		52 s/mm		52 s/mm	
Closes against the pressure	$\Delta p_{\max}$ [bar]	$\Delta p_s$ [bar]	$\Delta p_{\max}$ [bar]		$\Delta p_{\max}$ [bar]	$\Delta p_s$ [bar]	$\Delta p_{\max}$ [bar]	$\Delta p_s$ [bar]
VDL010F200								
VDL010F201								
VDL010F210								
VDL010F211								
VDL015F200								
VDL015F200H								
VDL015F201								
VDL015F210								
VDL015F201H								
VDL015F211								
VDL015F220	8.0	6.0	8.0		8.0	6.0	8.0	6.0
VDL015F221								
VDL020F200								
VDL020F201								
VDL020F210								
VDL020F210H								
VDL020F211								
VDL020F211H								
VDL020F220								
VDL020F221								
VDL025F210								
VDL025F211								
VDL025F200								
VDL025F201	8.0	8.0	8.0		8.0	8.0	8.0	8.0
VDL032F200								
VDL032F201								
Cannot be used to close with the pressure								

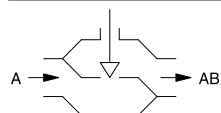
## Description of operation

The Valveco compact 2-way regulating valve is used for precise volume flow control on air conditioning, cooling and heating units, e.g. fan coil units, chilled ceilings, underfloor heating systems and air recirculation devices. The valve regulates the flow independently of the set volume flow. The dynamic VAV 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.

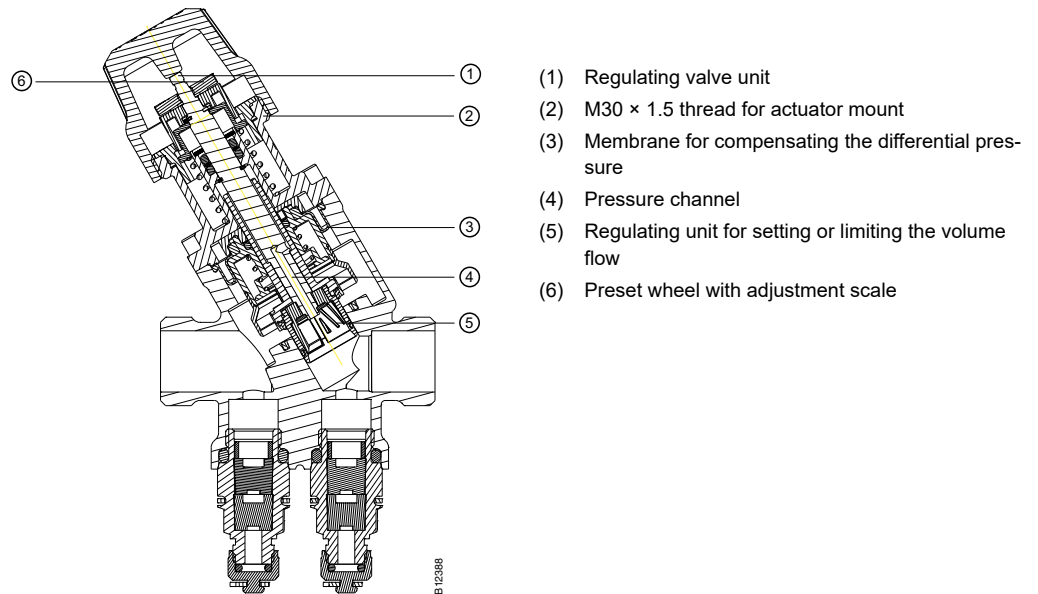
With a preset valve, the full valve stroke is available; therefore, control is always accurate in the control range up to 800 kPa across the valve.

The valve can be moved to any intermediate position with a thermal or motorised actuator. When the spindle is moved in, the valve is closed. It is reset by spring force in the valve.

Used with closing against the pressure



The valve may only be used with closing against the pressure. The direction of flow is marked on the valve.



The valve can be moved to the open or closed positions with the thermal actuator for unit valves AXT 301. In combination with the NC (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 with the AXS 315S continuous actuator for unit valves. The control signal is assigned linearly to the valve stroke and produces the equal-percentage characteristic in the valve. The positioner integrated in the actuator controls the actuator depending on positioning signal  $y$ . The continuous actuator positions the valve and, as soon as the position is reached, it stops.

The valve can be moved to any position with the AXM 217 motorised actuator for unit valves. With the AXF 217S and AXM 217S types (with positioner), the valve is continuously adjusted with a 0...10 V or 4...20 mA control signal. In combination with AXM217SF404, the necessary stroke adjustment takes place automatically.

Variants of the AXM 217(S) are:

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

The Valveco compact in sizes DN 40 and DN 50 can be combined with the AVM 215(S) actuator using the mounting set 0510390029.

### Intended use

This product is only allowed to be used in HVAC building systems for control and regulation purposes. Other uses require the prior consent of the manufacturer.

The section "Description of operation" and all product instructions in this data sheet must be observed.

Modifying or converting the product is not permitted.

The valves are suitable for control functions.

### Improper use

The product is not suitable for:

- Safety applications
- Open water circuits
- Drinking water installations
- Volume flow control in water circuits of pressure class > PN 25



#### Notice in accordance with California Proposition 65

The product contains lead. To be marketed in North America, the appropriate warnings must be affixed to the product or packaging.

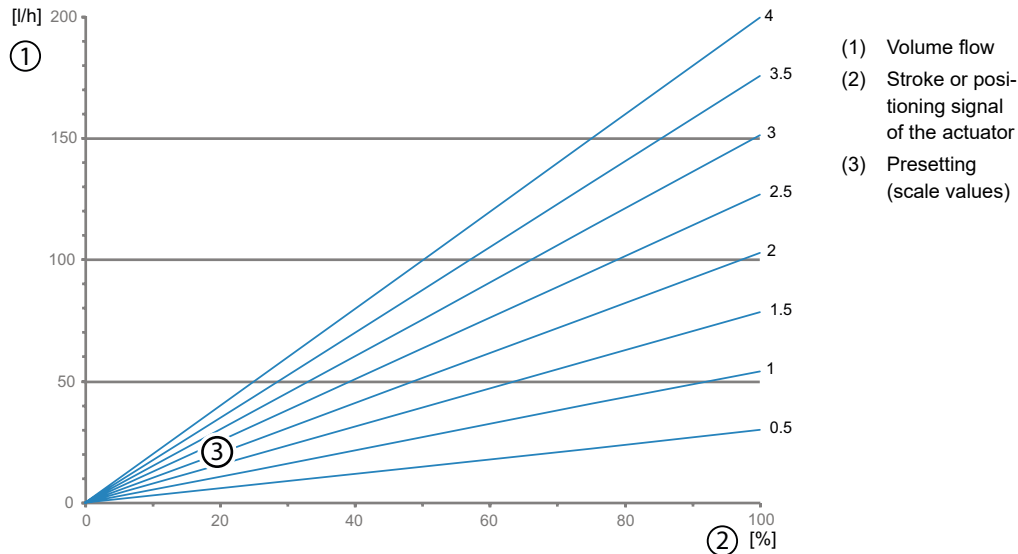
## Engineering and fitting notes

The Valveco compact comes with a protective cap. Rotating the protective cap changes the stroke position of the control unit, thus allowing full volume flow through the valve before the actuator for unit valves is fitted.

The maximum volume flow can be continuously adjusted on the preset wheel before the actuator is fitted. Use the conversion table in the fitting instructions for P100010941.

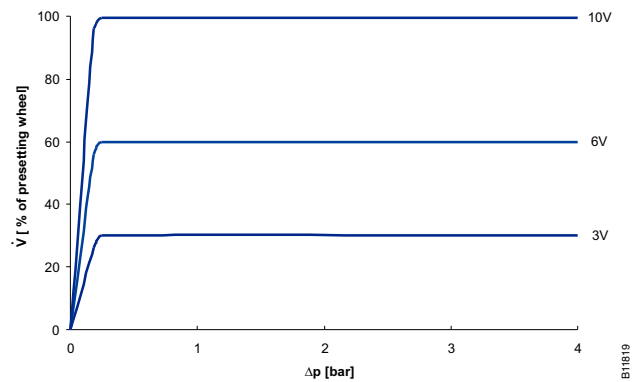
Presetting is possible without having to use any tools.

### Volume flow setting at full stroke – example VDL015F220



Due to the combination of dynamic hydronic balancing and dynamic control of the Valveco compact, adjustment of the system is not required. If the system is extended, the energy supply of the existing system remains unaffected.

### Example of volume flow



Example function:

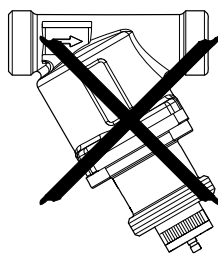
- DN 15 VDL015F210 with preset max. volume flow 370 l/h
- Volume flow as a function of the control voltage (0...10 V continuous control) and the differential pressure
- Control voltage 3 V, 6 V and 10 V

The integrated shut-off function allows easy fitting and dismantling. Thermal or motorised actuators can be fitted without using tools.

The valve may only be insulated up to the level of the cap nut or bayonet ring of the actuator.

### Fitting position

Do not fit the valve in a suspended position. The control unit could be damaged by the ingress of condensate or dripping water.



### Using with water

To increase the functional reliability of the valve, the system should conform to DIN EN 14336 (heating systems in buildings). The standard states, among other things, that the system has to be flushed through before being put into service.

To ensure that impurities are retained in the water (weld beads, rust particles, etc.) and the differential pressure controller is not damaged, we recommend fitting collecting filters, for example one for each floor or pipe run. Requirements for water quality as per VDI 2035.

When using an additive in the water such as an inhibitor or oxygen binding agent, the compatibility of the valve materials must be checked with the manufacturer of the additive. The materials table shown below may be used. When glycol is used, the recommended concentration is between 20% and 50%.

### Hydraulics and noise in plants

The valve can be used in a low-noise environment. To prevent flow noise, the pressure difference  $\Delta p_{\max}$  across the valve should not exceed 70% of the maximum values specified.

## Additional information

	Document no.
Fitting instructions for VDL 010...050	P100010941
Fitting instructions for AXF 217S	P100019389
Fitting instructions for AXM 217/217S	P100011418
Fitting instructions for AXS 315S	P100019937
Fitting instructions for AXT 301	P100019922
SAUTER slide rule for valve sizing	P100013496
Manual for SAUTER slide rule	7000129001
Declaration on materials and the environment	MD 57.003

### Valve design



SAUTER provides various tools for valve design and engineering:

- ValveDim smartphone app
- ValveDim PC program
- ValveDim slide rule

You can find the tools under the link [www.sauter-controls.com/en/performance/valve-calculation/](http://www.sauter-controls.com/en/performance/valve-calculation/) or scan the QR code



## Design and materials

### Material numbers as per DIN/EN (VDL 010...032)

	DIN/EN material no.	DIN/EN designation
Valve body	CW602N	CuZn36Pb2As (DZR brass) as per EN 12165
Valve seat	CW602N	CuZn36Pb2As (brass) as per EN 12165
Spindle	1.4301	X5CrNi18-10 (stainless steel) as per EN 10088-1
Pressure control plug	–	PPS (polyphenylene sulphide)
Cap	–	PC/ABS (polycarbonate/acrylonitrile butadiene styrene)



	DIN/EN material no.	DIN/EN designation
Spindle seal	–	HNBR/EPDM (ethylene propylene diene monomer)
Guide plug	CW602N	CuZn36Pb2As (DZR brass) as per EN 12165
Stuffing box	–	EPDM (ethylene propylene diene monomer)

Valve body made of dezincification-resistant moulded brass (DZR)

Male thread, metric, as per ISO 228/1, class B, flat seal on housing

#### Material number as per DIN/EN (VDL 040...050)

	DIN/EN material no.	DIN/EN designation
Valve body	EN-JS1030	GJS-400 (cast iron) as per EN 1563
Valve seat	CW602N	CuZn36Pb2As (brass) as per EN 12165
Spindle	1.4301	X5CrNi18-10 (stainless steel) as per EN 10088-1
Pressure control plug	–	PPS (polyphenylene sulphide)
Spindle seal	–	HNBR/EPDM (ethylene propylene diene monomer)
Guide plug	CW602N	CuZn36Pb2As (DZR brass) as per EN 12165
Stuffing box	–	EPDM (ethylene propylene diene monomer)

Valve body made of cast iron with spheroidal graphite, painted black

Female thread, metric, as per ISO 228/1 class B

### Definition of pressure differences

- $\Delta p_v$ :** Maximum admissible pressure difference over the valve at every stroke position, limited by noise level and erosion. With this parameter, the valve is characterised as a flow element with specific hydraulic behaviour. Monitoring the cavitation and erosion along with the associated noise increases both the service life and the operational capacity.
- $\Delta p_{max}$ :** Maximum admissible pressure difference over the valve at which the actuator can reliably open and close the valve. The following are considered: Static pressure and flow effects. This value ensures trouble-free stroke movement and tightness. The value  $\Delta p_v$  of the valve is never exceeded.
- $\Delta p_s$ :** Maximum admissible pressure difference over the valve in the event of a malfunction (e.g. power failure, excessive temperature or pressure, pipe break) at which the actuator can close the valve tightly and, if necessary, maintain the entire operating pressure against atmospheric pressure. Because this is a safety function with a rapid stroke movement,  $\Delta p_s$  can be greater than  $\Delta p_{max}$  or  $\Delta p_v$ . The flow disturbing effects that arise here are quickly passed through. They are of secondary importance with this method of operation. For 3-way valves, the values only apply to the control passage.
- $\Delta p_{stat}$ :** Line pressure behind the valve. This essentially corresponds to the idle pressure when the pump is switched off, caused for example by the fluid level in the system, increased pressure due to pressure tanks or steam pressure. For valves that close with pressure, the static pressure plus the pump pressure are used.

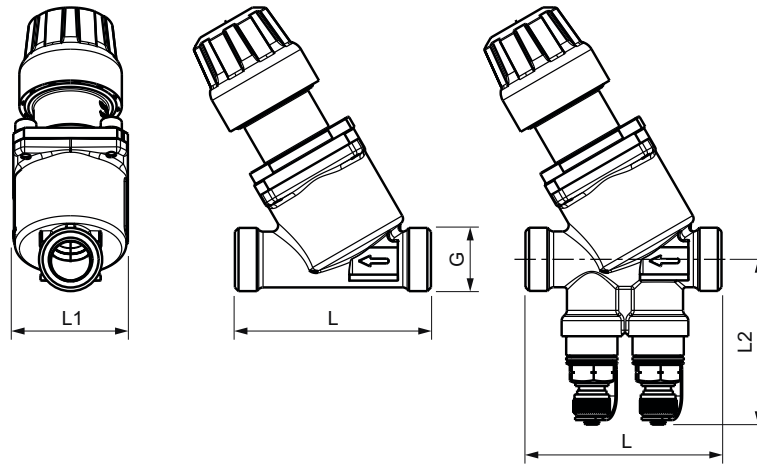
### Disposal

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

All dimensions in mm.

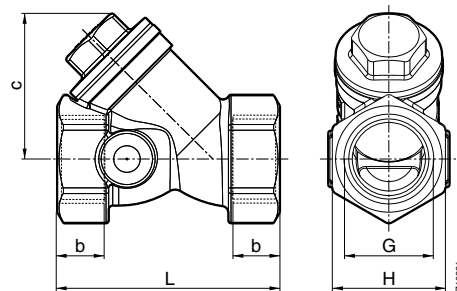


Actuator mount: M30×1.5

Type	G (inch)	L	L1	L2
VDL010F2**	G½ B	65	38	57
VDL015F2**	G¾ B			
VDL020F2**	G1 B	70	38	57
VDL025F200	G1¼ B	104	63	63
VDL025F201				
VDL025F210		78	38	59
VDL025F211				
VDL032F20*	G1½ B	104	63	68
VDL040F201	G1½ B	138	90	71
VDL050F201	G2 B			77

### Accessories

Strainer 05603320\*\*



DN	b	c	G (inch) ISO 228-1	L	H
15	12	38	G½	54	27
20	15	43	G¾	67	34
25	16	53	G1	79	41
32	17	64	G1¼	98	51*
40	18	70	G1½	106	57*
50	20	85	G2	122	69*

\*) octagonal