

DOROT Back-flushing Valves



Advanced hydraulic solutions for optimal management of liquid conveyance systems

 **Aquestia**

Directing the Flow

Introduction

DOROT Control Valves has earned a decades-long reputation for delivering superior control valve solutions for Back-flush Systems. Owing to our strong relationships with leading filter manufacturers worldwide, Dorot can offer the most advanced, high-reliability/high-performance solutions available in the marketplace, supported by our deep understanding of filtration systems. All Dorot valves are designed and manufactured in-house, to exacting levels of performance and reliability.

This catalog supports design engineers, dealers and end-users with essential operating procedures and technical specifications. It includes hydraulic performance and ordering guides for the entire range of Dorot Back-flush Valves, plus additional information on special solutions and control applications.

Filtration is an indispensable function in today's water systems. Whether for residential, agricultural or industrial use, the efficient and effective removal of impurities from water systems is critical.

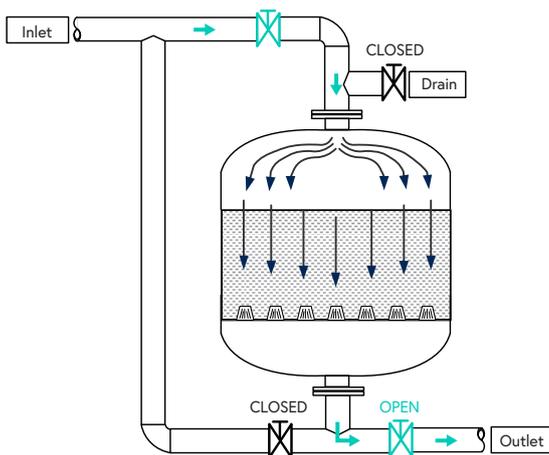
Different filtration methods are available such as, screen filters, disc filters, media filters, sand separators and others. All filter types however, require consistent comprehensive cleaning for the removal of accumulated dirt, particulate matter and other contaminants from the filtration element.

Cleaning the filtration element can be performed in several ways: manual rinsing, mechanical brushing/scraping, suction by scanner or Back-flushing.

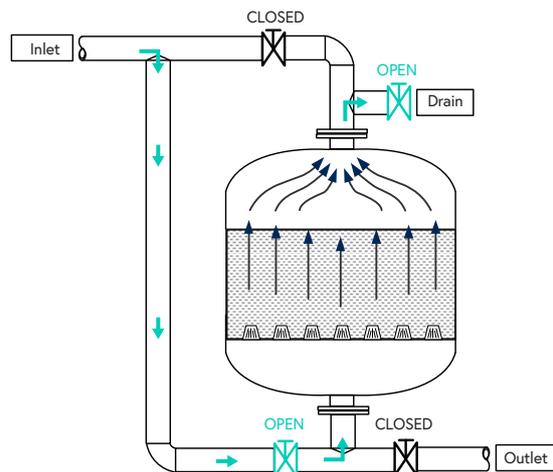
Back-flushing operation consists of applying a relatively clean, reverse-flow through the filter element and then discharging the water flow carrying dirt and debris out of the system through a drain line.

Example: Single media filter Back-flushing principle (without Back-flushing valves):

Filtration Mode



Back-flushing Mode



Back-flushing procedures require numerous valves (at least 4 per filter) in synchronized operation, making it complex to operate manually and costly to automate.

The use of Hydraulic Back-flushing Valves simplifies synchronization of the control system, reducing the number of valves required and allowing valve operation with little or no electrical power consumption.

Operating principle

Hydraulic Back-flushing Valve

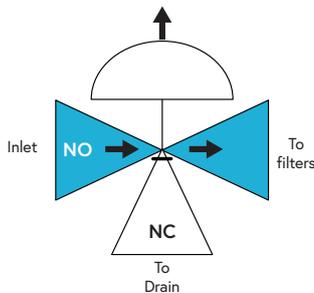
Back-flushing control valves are 3/2, semi-automatic control valves actuated by a pressure command. The valve has 3 ports:

Inlet port	connected to the water source
Outlet / Common port	connected to the filter
Drain port	connected to the drain collector

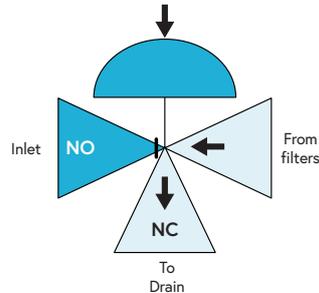
The valve is controlled manually, electrically or by remote pressure command to change position and connect the outlet and drain ports during the Back-flushing cycle. As flushing cycle ends, the valve returns to its normal position - connecting the inlet and outlet ports.

Straight-flow, Back-flush Control Valve

Filtration Mode

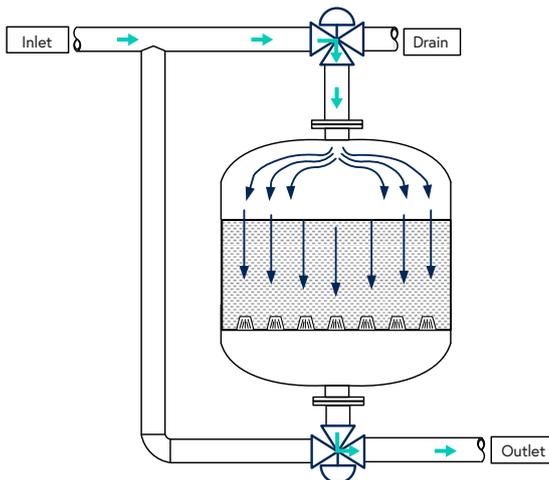


Back-flushing Mode

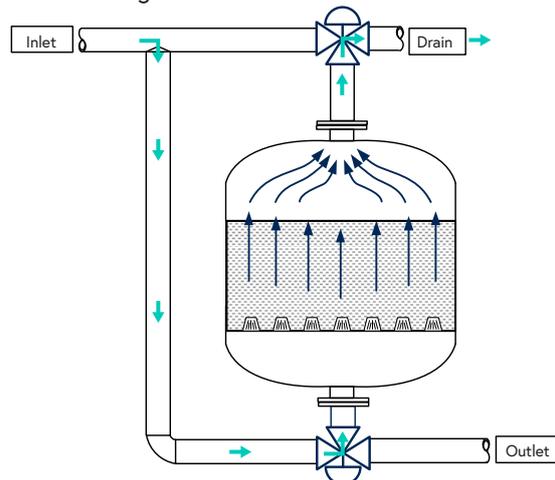


Media filter back-flush system using back-flush control valves:

Filtration Mode



Back-flushing Mode



Benefits

Hydraulic Back-flushing Valves:

- Low-power automation (actuation by the line pressure or by compressed air). Electric actuation is possible using low-power solenoid valves that can be fed either by continuous power or by battery powered controller.
- Minimal number of valves required per filter.
- No need to synchronize the operation of two valves - one port closes while another simultaneously opens - the entire operation is integrated in the back-flush control valve.
- Simple maintenance, no motor gear or other electro-mechanical elements.

Direct Diaphragm, Polymeric Back-flushing Control Valve

Reinforced Polyamide body, direct diaphragm-sealing valve, designed for automatic back-flush of filtration batteries

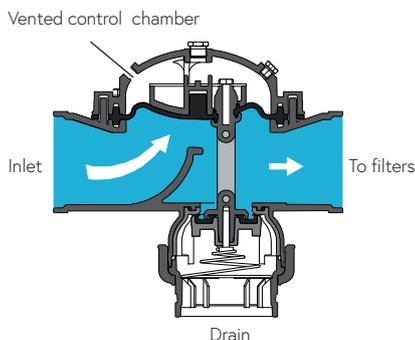


Features

- Corrosion-proof materials (additional versions for seawater and aggressive media available)
- Sturdy body, made of Glass-Reinforced Polyamide (GRP)
- Lightweight
- Valve changes position in a frictionless manner
- Simple and easy maintenance
- Easy installation, no special tools or expertise required
- Special design models for disc and media filtration systems

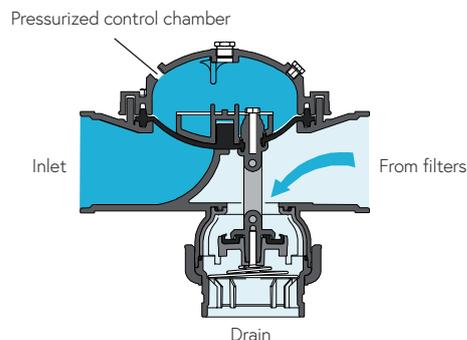
Operating principle

Filtration Mode



De-pressurized command - control chamber is vented to atmosphere: The valve allows straight flow. Bottom drain port is closed.

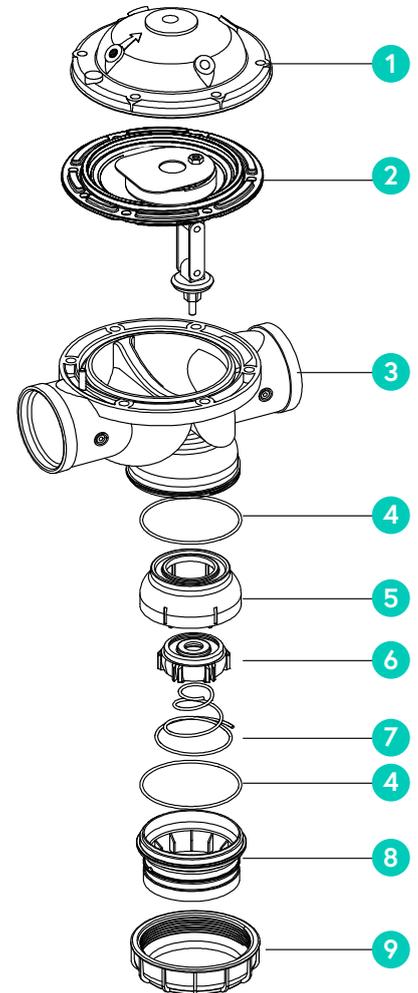
Back-flushing Mode



Pressure command - control chamber is pressurized: The valve inlet port is closed by the diaphragm and the bottom port opens to allow flow from the filter, out to the drain.

Main parts

No.	Part
1	Bonnet
2	Diaphragm kit
3	Body
4	Sealing ring
5	Seat
6	Plug
7	Spring
8	Adapter
9	Locking nut

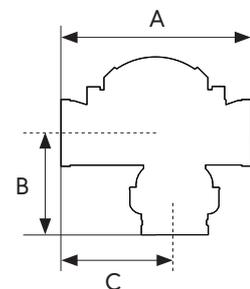


Materials

Part	Standard	Drinking Water	Seawater	Mines
Body & Bonnet	PA	PA	PA	PA
Shaft	SST 302	SST 302	SST 316	SST 316
Spring	SST 302	SST 302	SST 316	SST 316
Screws	SST 302	SST 302	SST 316	SST 316
Seals	NR	EPDM	NR	ALD
Diaphragm	NR	EPDM	NR	ALD

Dimensions

Inlet / Outlet		Drain		Dimensions mm / inch			Weight Kg / Lbs
mm	inch	mm	inch	A	B	C	
100	4	100	4	316/12 ⁵ / ₁₆	170 / 6 ¹¹ / ₁₆	187 / 7 ³ / ₄	5.5 / 12.2
100	4	80	3	316/12 ⁵ / ₁₆	170 / 6 ¹¹ / ₁₆	187 / 7 ³ / ₄	5.5 / 12.2
80	3	80	3	286/11 ¹ / ₄	164 / 6 ⁵ / ₁₆	174 / 6 ⁷ / ₈	4.2 / 9.2
80	3	50	2	286/11 ¹ / ₄	164 / 6 ⁵ / ₁₆	174 / 6 ⁷ / ₈	4.2 / 9.2



End connections

Inlet / Outlet ports	Grooved
Drain port	Grooved, Threaded 3", Male* / Female, NPT / BSP *only for 3" drain port

Hydraulic performance

Size		3 x 2	3 x 3	4 x 3	4 x 4
Max. recommended flow at filtration mode	m ³ /h	90	90	160	160
	gpm	400	400	700	700
Max. recommended flow at Back-flushing mode	m ³ /h	40	90	90	160
	gpm	180	400	400	700
Flow rate factor at filtration mode	Kv (metric)	130	130	160	160
	Cv (US)	150	150	185	185
Flow rate factor at Back-flushing mode	Kv (metric)	57	65	70	83
	Cv (US)	66	75	81	96

Operating pressure range

Standard model: 1-10 bar / 14.5-145 psi

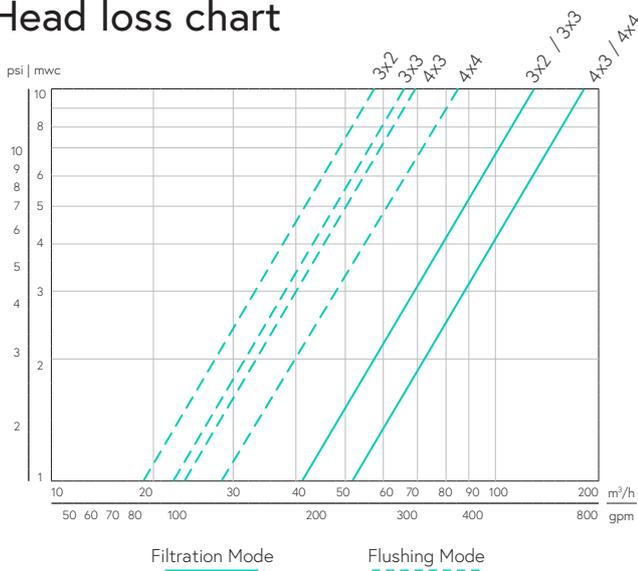
Low pressure model: 1-6 bar / 14.5-90 psi

High-pressure model: 3-10 bar / 45-145 psi

Maximum operating temperature:

60°C (140°F)

Head loss chart



Applications

Sand Media Filters



Disc Filter System



Direct diaphragm, Metal Back-flushing Control Valve

Cast iron body, 3-directional diaphragm-sealing valve, designed for automatic back-flush of filtration filters

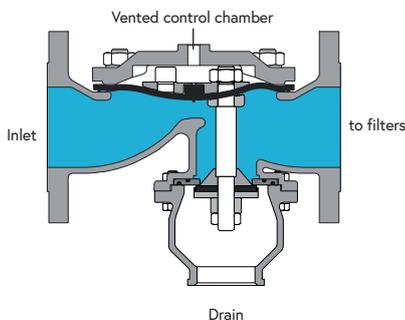


Features

- Sturdy body made of cast iron (optional SST version)
- Frictionless position change
- Low head-losses
- Easy installation, no special tools or expertise required
- Grooved (model 58) or flanged (model 57) connections available
- Special design model for disc filtration systems
- Optional model for high-pressure filtration systems available

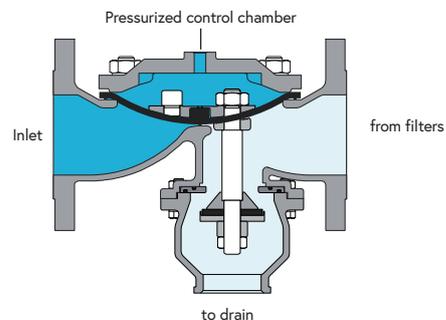
Operating principle

Filtration Mode



De-pressurized command - control chamber vents to atmosphere: The valve allows straight flow. Bottom drain plug is closed.

Back-flushing Mode



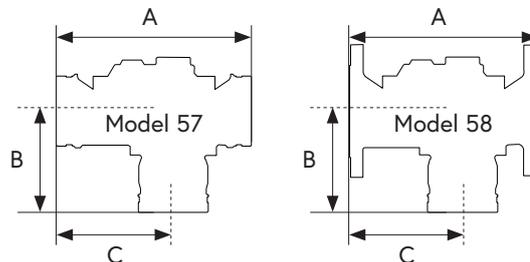
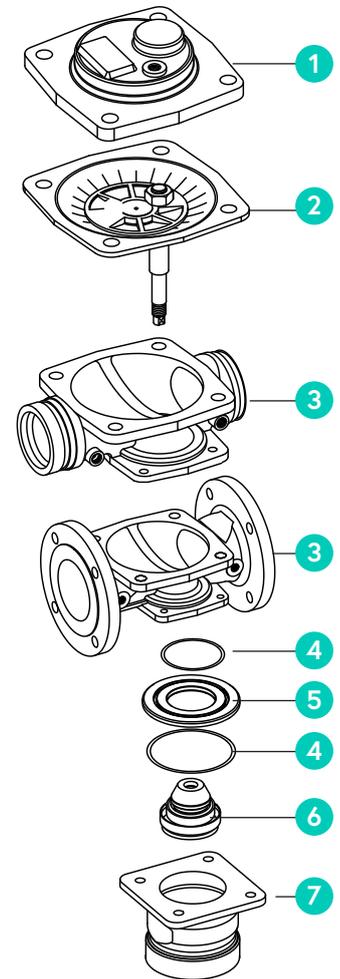
Pressure command - control chamber is pressurized: The valve inlet port is closed by the diaphragm and the bottom port opens to allow flow from the filter, out to the drain.

Main parts

No.	Part
1	Bonnet
2	Diaphragm kit
3	Body
4	Sealing ring
5	Seat
6	Plug
7	Adapter

Materials

Part	Material	Optional Material
Body & Bonnet	Cast Iron	SST
Bolts & Nuts	Coated Steel	SST
Diaphragm	NR	NBR, EPDM, ALD or other
Shaft	SST 303	
Seat	Brass	SST
Plug cone	Brass	SST
Seal	NR	NBR, EPDM, ALD or other
Spring (optional)	SST 302	



Dimensions

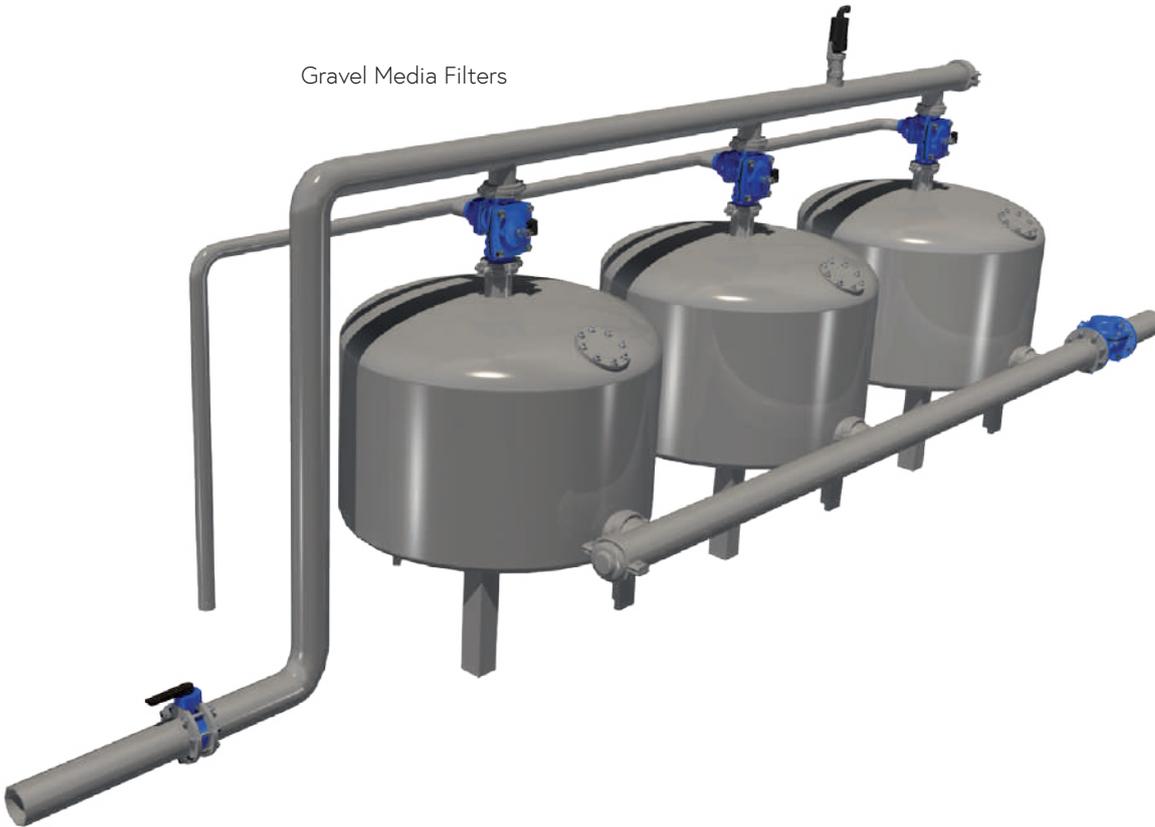
	Inlet / Outlet		Drain		Dimensions mm / inch			Weight Kg / Lbs
	mm	inch	mm	inch	A	B	C	
57	80	3	50	2	289 / 11 ³ / ₈	158 / 6 ¹ / ₄	176 / 6 ¹⁵ / ₁₆	22 / 48
	100	4	80	3	305 / 12 ³ / ₁₆	161 / 6 ⁷ / ₁₆	184 / 7 ⁵ / ₁₆	25 / 55
58	80	3	50	2	287 / 11 ⁵ / ₁₆	152 / 6	175 / 6 ⁷ / ₈	15 / 33
	100	4	80	3	323 / 12 ¹¹ / ₁₆	167 / 6 ⁹ / ₁₆	194 / 7 ⁵ / ₈	18 / 40

End connections

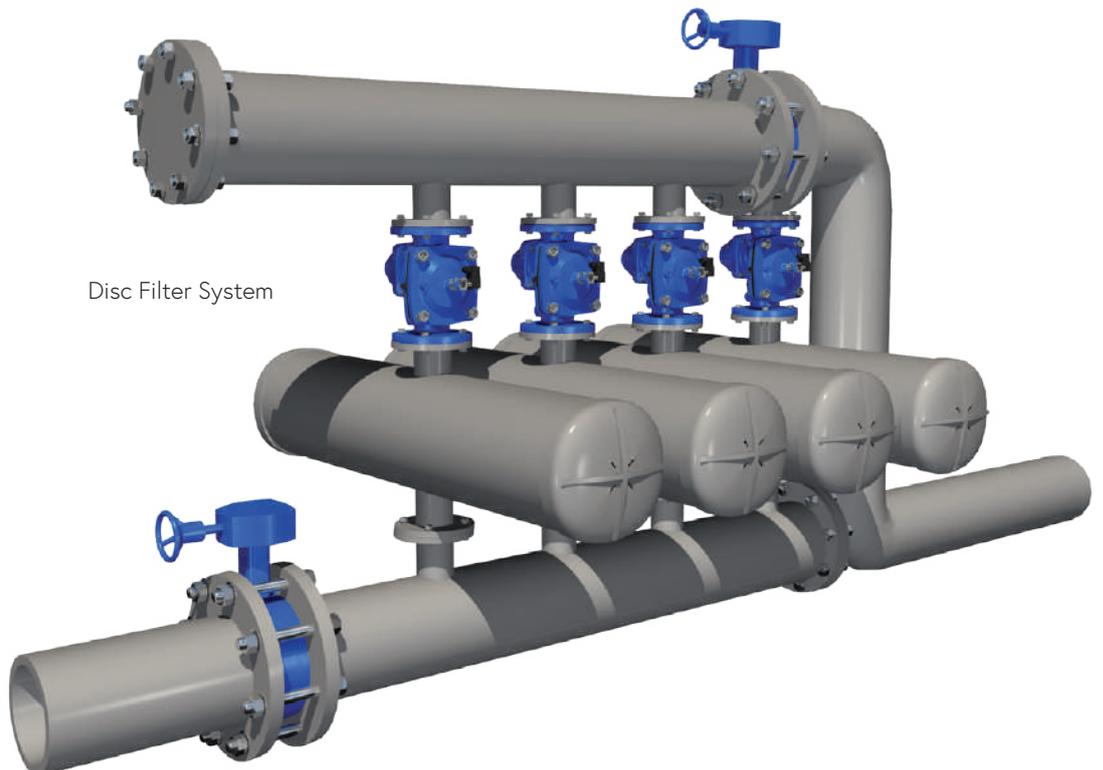
Inlet / Outlet ports	Model 57 - Flanged, Model 58 - Grooved
Drain port	Grooved or Female-threaded
In 4x3 models	Internal 3" / 80mm thread and external Grooved 4" / 100mm connection
Flange standards	ISO 2084 / ANSI B16 / BSTD (others upupon request)
Thread standards	Female NPT / BSP

Applications

Gravel Media Filters



Disc Filter System



Double-chamber, Metal Back-flushing Valve

2"/ 50mm Brass body, 3-directional, double-chamber valve for Back-flushing of filtration batteries

Features

- Simple, compact design
- Double chamber structure
- Non-metallic actuator construction
- Super-fast position change
- In-line maintenance
- Easy installation, no special tools or expertise required
- Straight or angle flow with easy conversion from one model to another, offering maximum flexibility in system design

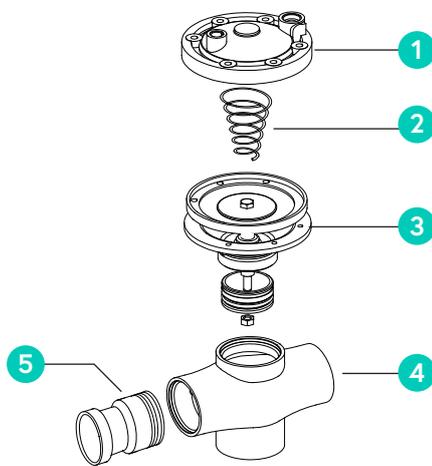


Operating principle

	Filtration Mode Control chamber is de-pressurized - The valve is in filtration mode	Back-flushing Mode Control chamber pressurized - The valve is in flushing mode
Model 51		
Model 52		

Main parts

No.	Part
1, 5	Bonnet
2	Spring
3	Diaphragm & Actuator Kit
4	Body
5	Grooved connection adapter

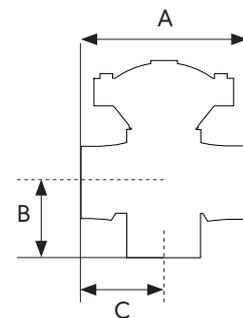


Materials

Part	Standard	High Pressure	Optional
Bonnet	GRP	Aluminum	SST
Diaphragm	NR	NR	EPDM
Spring	SST 302	SST 302	SST 316
Diaphragm discs	Brass	Brass	SST 316
Screws	SST 302	SST 302	SST 316
Operator Body	GRP	Brass	SST
Body	Brass	Brass	SST
Shaft	SST 304	SST 304	SST 316
Plug assy.	Brass	Brass	SST
Seals	NBR	NBR	Viton

Dimensions

Inlet / Outlet / Drain		Dimensions mm / inch			Weight Kg / Lbs
mm	inch	A	B	C	
50	2	155/6 ¹ / ₆	75 / 2 ¹⁵ / ₁₆	78 / 3 ¹ / ₁₆	3.1 / 6.8



End connections

Groove adapters supplied upon request.

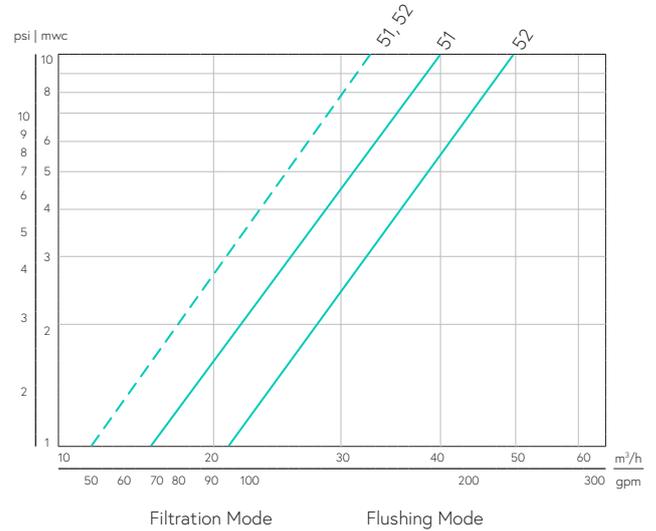
Each groove adapter adds 30 mm (11/8 inch) to the length / height dimensions according to its location.

Threaded connections: Female - NPT / BSP

Hydraulic performance

Model		51	52
Size		2 x 2	2 x 2
Max. recommended flow at filtration mode	m ³ /h	40	40
	gpm	176	176
Max. recommended flow at Back-flushing mode	m ³ /h	40	40
	gpm	176	176
Flow rate factor at filtration mode	Kv (metric)	43	52
	Cv (US)	50	60
Flow rate factor at Back-flushing mode	Kv (metric)	40	37
	Cv (US)	45	43

Head loss chart



Operating pressure range

Standard pressure model: 0.7-10 bar / 10-150 psi

High Pressure model: 0.7-16 bar / 10-250 psi

Maximal operating temperature

Standard model: 60°C (140°F)

Hot water model: 90°C (195°F)

Ordering guide

Ordering data	Ordering code							Ordering data
	5□	2x2	□	□	□	□	□□	
Filtration flow direction								Special versions
Straight	1							HW Hot Water
Angle	2							HP High Pressure (16 bar)
Inlet port connection								Coating
Grooved adapter	→		V			R	←	Polyester Red
BSP Thread	→		B			L	←	Polyester Blue
NPT Thread	→		N			X	←	Other (specify)
Outlet port connection								Drain port connection
Grooved adapter	→		V	V			←	Grooved adapter
BSP Thread	→		B	B			←	BSP Thread
NPT Thread	→		N	N			←	NPT Thread

Applications



Double-chamber, Polymeric Back-flushing Valve

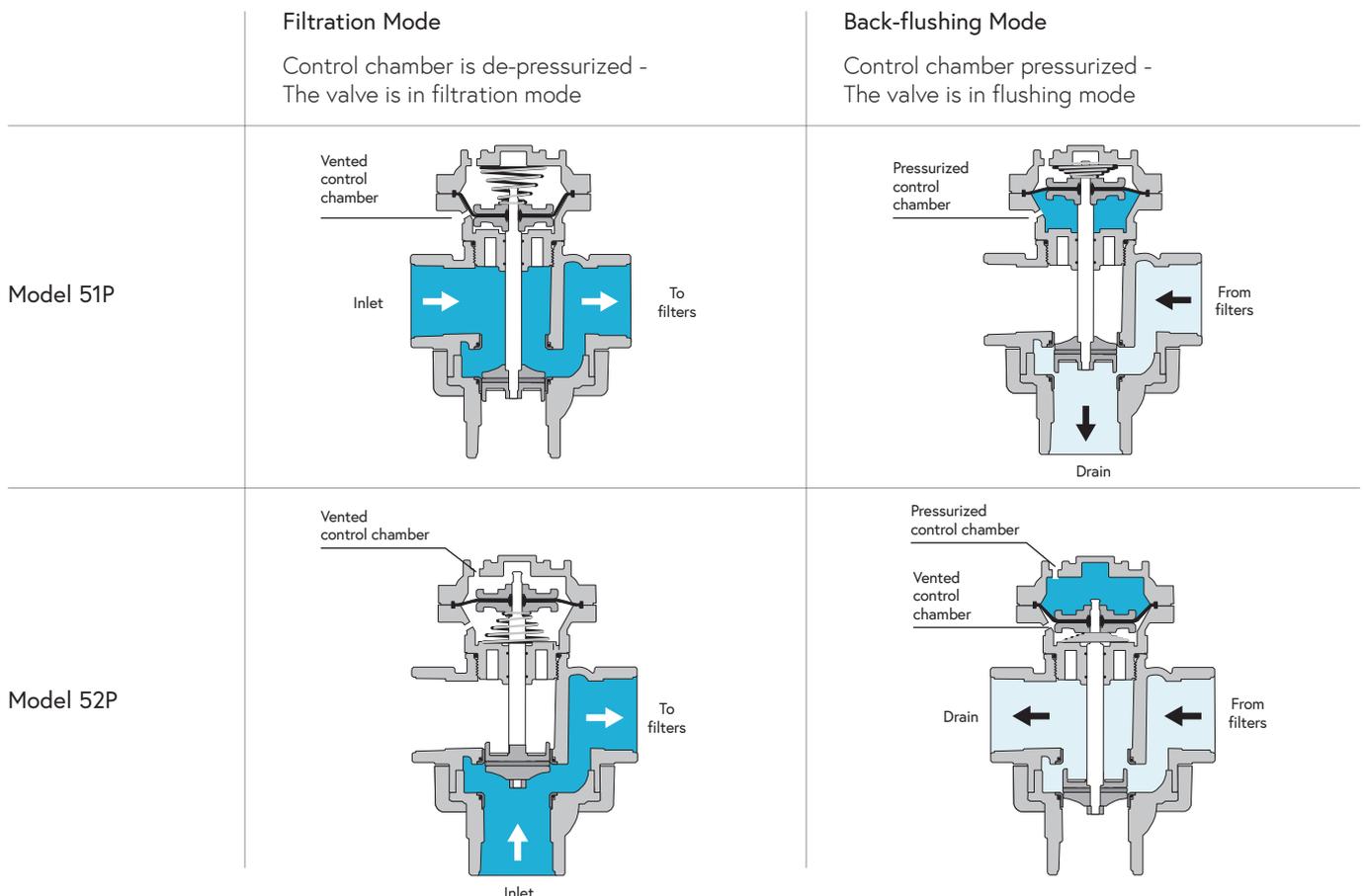
2"/ 50mm Reinforced-Polyamide body, 3-directional, double-chamber valve for Back-flushing of filtration batteries

Features

- Corrosion-proof materials (additional versions for seawater and aggressive media available)
- Sturdy body, made of Glass-Reinforced Polyamide (GRP)
- Lightweight
- Simple, compact design
- Double chamber structure
- Super-fast position change
- In-line maintenance
- Easy installation, no special tools or expertise required
- Straight or angle flow with easy conversion from one model to another, offering maximum flexibility in system design



Operating principle

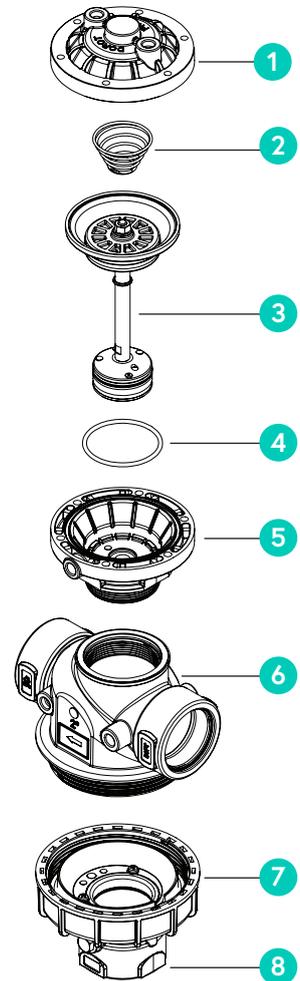


Main parts

No.	Part
1	Bonnet
2	Spring
3	Diaphragm & Actuator Kit
4	O-ring
5	Actuator body
6	Body
7	Locking ring
8	Adapter

Materials

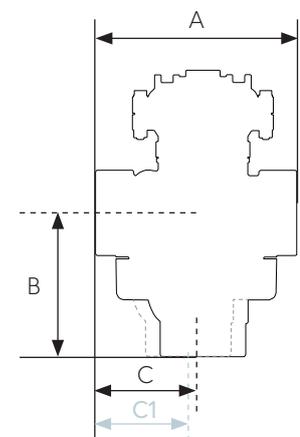
Part	Standard
Bonnet	GRP
Diaphragm	NR
Spring	SST 302
Diaphragm discs	GRP
Screws	SST 302
Operator Body	GRP
Body	GRP
Shaft	SST 316
Plug assy.	PA
Seals	NR



Dimensions

Inlet / Outlet / Drain		Dimensions mm / inch			Weight Kg / Lbs
mm	inch	A	B	C	
50	2	180 / 7 1/8	135 / 5 5/16	90 / 3 1/2	3.1 / 6.8

C1 - offset adapter model - AZ



End connections

Groove adapters supplied upon request.

Each groove adapter will add 30 mm (1 1/8 inch) to the length / height dimensions according to its location.

Threaded connections: Female - NPT / BSP

Hydraulic performance

Model		51P	52P
Size		2 x 2	2 x 2
Flow rate factor at filtering	Kv (metric)	56	61
	Cv (US)	65	70
Flow rate factor at flushing	Kv (metric)	69	55
	Cv (US)	80	63

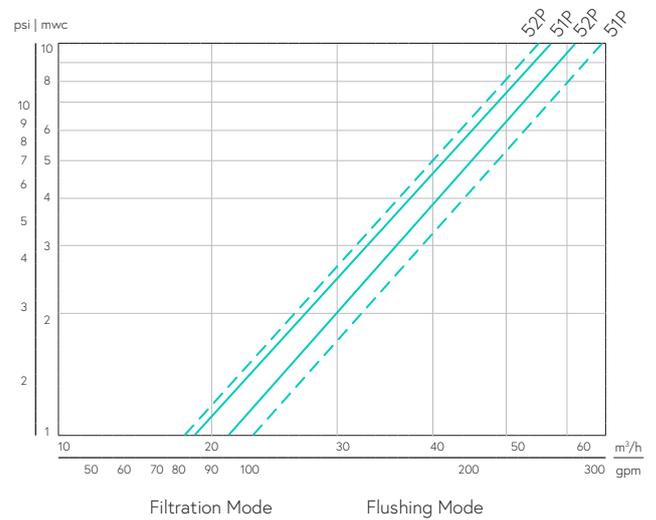
Operating pressure range

Standard model: 1-10 bar / 15-150 psi

Maximal operating temperature

Standard models: 65°C (150°F)

Head loss chart

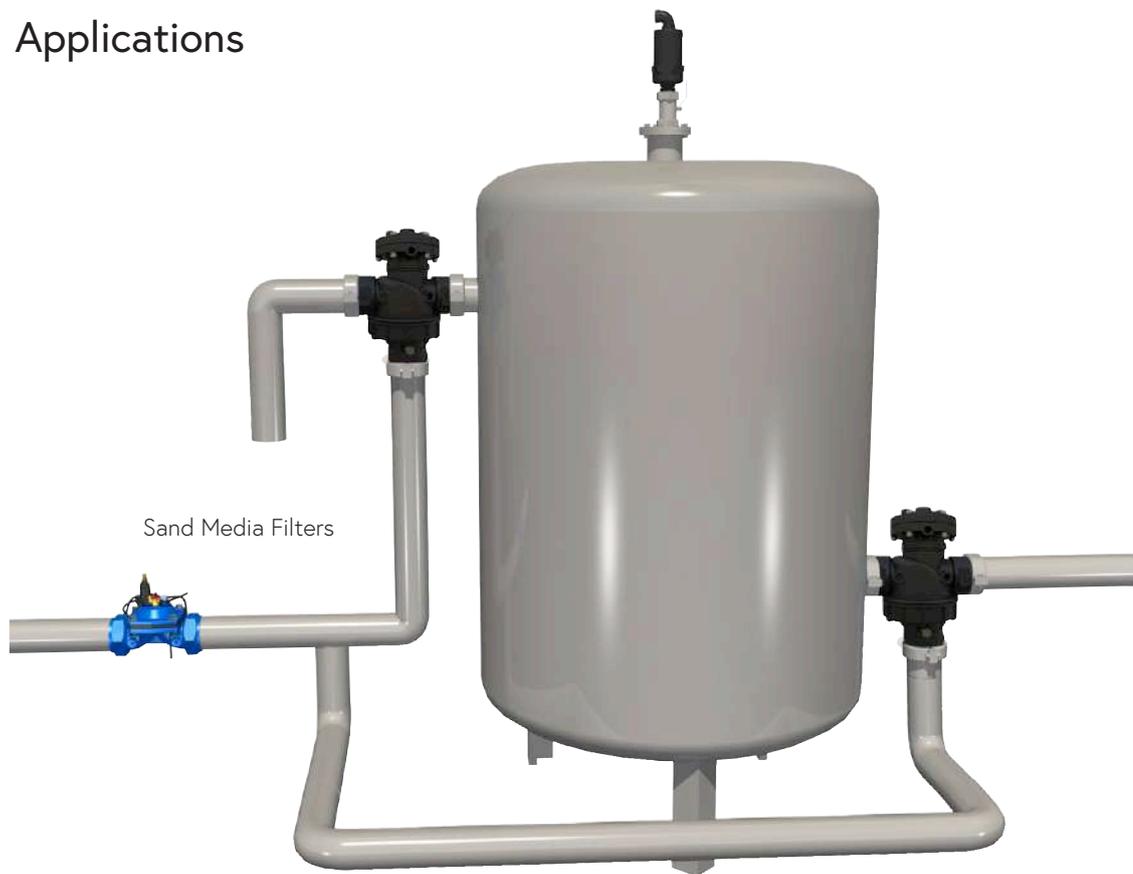


Ordering guide

Ordering data		Ordering code					Ordering data	
	5□P	2x2	□	□	□	□□		
Filtration flow direction							Special versions	
Straight	1						AZ*	Offset adapter
Angle	2							None
Inlet port connection							Drain port connection	
Grooved adapter	→						V	Grooved adapter
BSP Thread	→						B	BSP Thread
NPT Thread	→						N	NPT Thread
Outlet port connection								
Grooved adapter	→		V					
BSP Thread	→		B					
NPT Thread	→		N					

* Adapter suitable for AZUD filter batteries only.

Applications



Sand Media Filters



Double Disc Filter System

Double-chamber, Metal Back-flushing Control Valve

Cast iron, 3-directional, double-chamber valve for Back-flushing of filtration batteries



Features

- Sturdy body made of cast iron
- Double chamber structure
- High-flow coefficient allows high flow and low pressure losses
- Super-fast position change
- Easy installation, no special tools or expertise required
- Suitable materials for drinking-water use
- Straight or angle flow with easy conversion from one model to another, offering maximum flexibility in system design

Operating principle

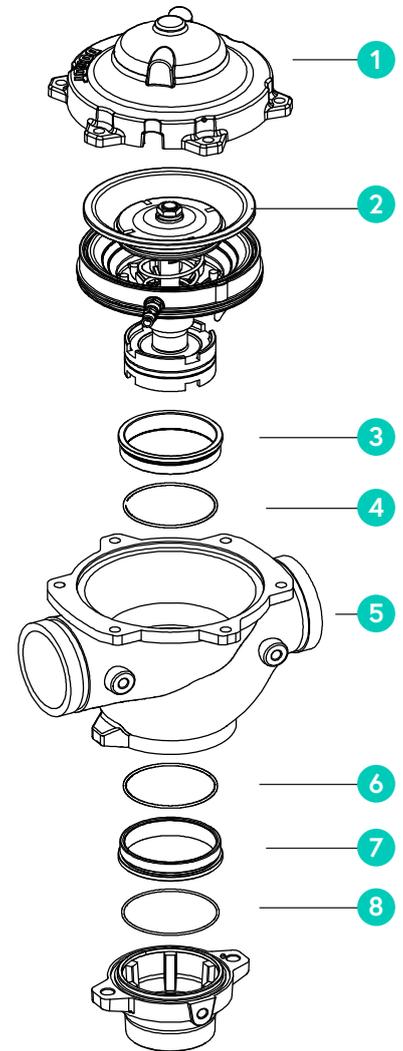
	Filtration Mode Control chamber is de-pressurized - The valve is in filtration mode	Back-flushing Mode Control chamber pressurized - The valve is in flushing mode
Model 62	<p>Vented control chamber</p> <p>Inlet → to filters</p> <p>Drain</p>	<p>Pressurized control chamber</p> <p>Inlet ← from filters</p> <p>Drain</p>
Model 63	<p>Vented control chamber</p> <p>Drain to filters</p> <p>Inlet</p>	<p>Pressurized control chamber</p> <p>Drain ← from filters</p> <p>Inlet</p>

Main parts

No.	Part
1	Bonnet
2	Diaphragm & Actuator Kit
3	Seat
4	O-ring
5	Body
6	O-ring
7	Seat
8	O-ring

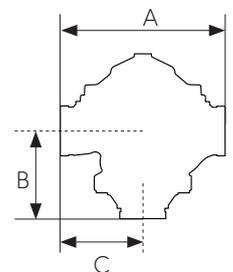
Materials

Part	Standard	High Pressure
Bonnet	C.I.	C.I.
Diaphragm discs	PAGF	PAGF
Bottom chamber	PAGF	Bronze
Spring	SST 302	SST 302
Seals	NR	NR
Diaphragm	NR	NR
Bolts & Nuts	SST 302	SST 302
Shaft	SST 316	SST 316
Plug Assy.	PAGF	PAGF
Seats	SST 304	SST 304



Dimensions

Inlet / Outlet		Drain		Dimensions mm / inch			Weight Kg / Lbs
mm	inch	mm	inch	A	B	C	
80	3	50	2	290 / 11 ⁷ / ₁₆	168 / 6 ⁵ / ₈	145 / 5 ¹¹ / ₁₆	18 / 40
80	3	80	3	290 / 11 ⁷ / ₁₆	157 / 3 ³ / ₁₆	145 / 5 ¹¹ / ₁₆	
100	4	80	3	317 / 12 ¹ / ₂	200 / 7 ⁷ / ₈	158 / 6 ¹ / ₄	27 / 60
100	4	100	4	317 / 12 ¹ / ₂	200 / 7 ⁷ / ₈	158 / 6 ¹ / ₄	



End connections

Inlet / Outlet ports	Grooved
Drain port	Threaded or Grooved
Thread standards	Female NPT / BSP

Hydraulic performance

Model		62 & 63				
Size		4 x 2	4 x 3	4 x 4	3 x 3	3 x 2
Max. recommended flow at filtration mode	m ³ /h	160			90	
	gpm	700			400	
Max. recommended flow at Back-flushing mode	m ³ /h	40	90	160	90	40
	gpm	180	400	700	400	180
Flow rate factor at filtration mode	Kv (metric)	160			100	
	Cv (US)	185			115	
Flow rate factor at Back-flushing mode	Kv (metric)	110	140	205	145	80
	Cv (US)	128	163	238	168	93

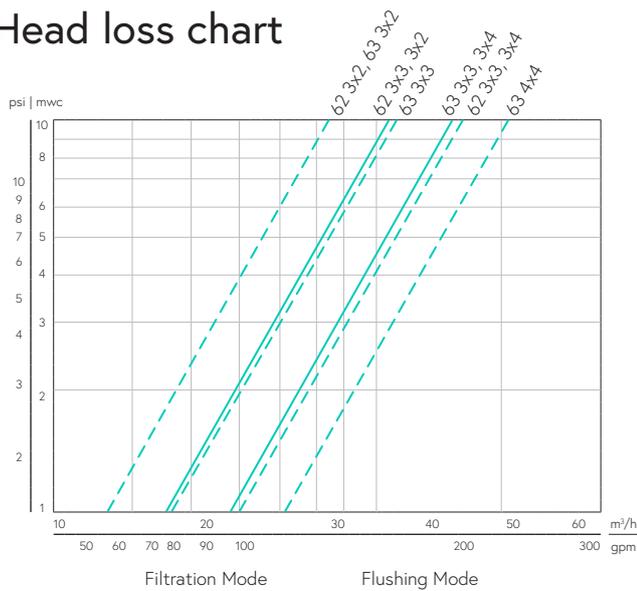
Operating pressure range:

Standard version: 0.5-12 bar / 7-180 psi

*When using 4-way control circuit with external pressure source, no minimal line pressure is required

Maximum operating temperature: 60°C (140°F)

Head loss chart



Ordering guide

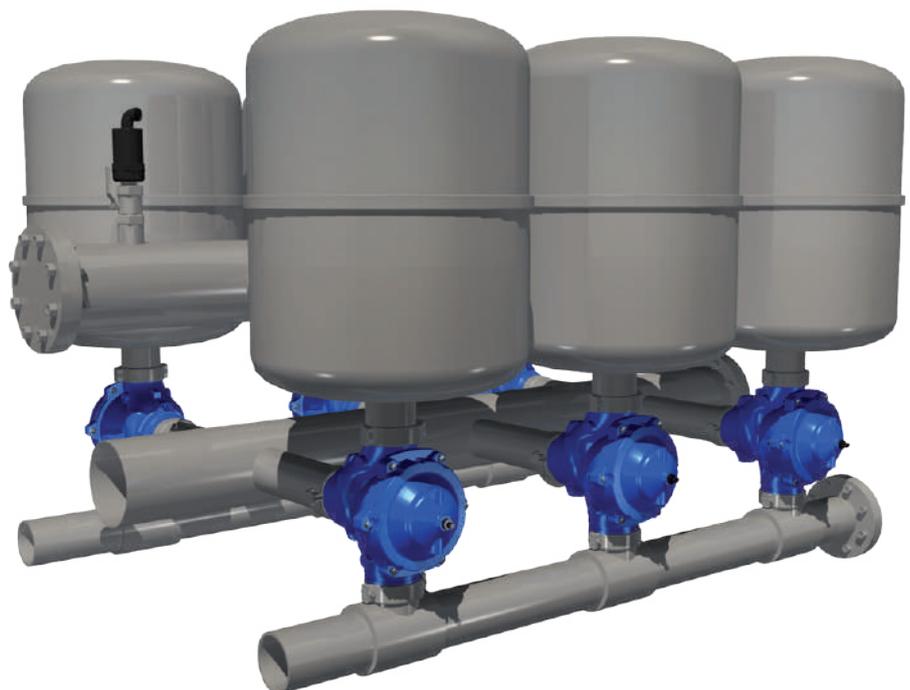
Ordering data		Ordering code					Ordering data	
	6□	□	X	□	□	□		
Flow direction at filtering							Coating	
Straight	2					L	Polyester Blue	
Angle	3					R	Polyester Red	
Top port size						X	Other (specify)	
4" / 100mm	→	4				Drain port connection		
3" / 80mm	→	3				V	Grooved (VIC)	
Bottom port size						B	BSP Thread	
4" / 100mm	→		4			N	NPT Thread	
3" / 80mm	→		3					
2" / 50mm	→		2					

Applications

Sand Media Filters



Disc Filter System



Double-chamber 2"/50mm Back-flushing Valve

Brass body, double-chamber control valve, designed to enable automatic backflush of screen filters

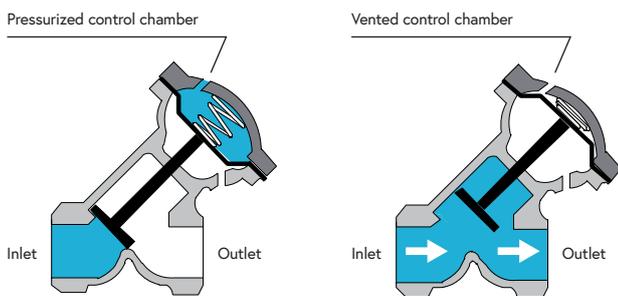


Features

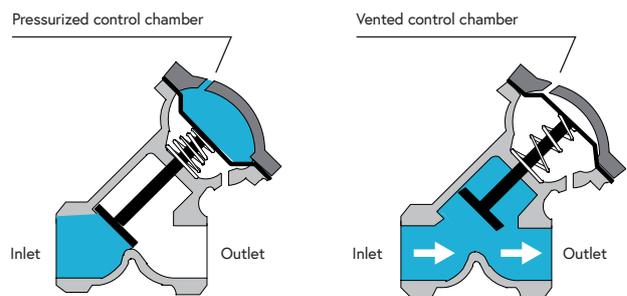
- A sturdy body made of Brass (SST optional)
- Double chamber control
- In-line maintenance
- Fast reaction
- Easy installation, no special tools or expertise required
- Configurable to "Normally Open" or "Normally Closed" operation
- Optional manual throttling
- Straight (model 09) or angle (model 09-A) flow

Operating principle

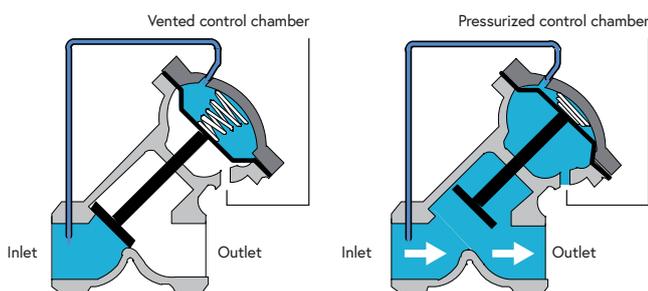
Standard Model



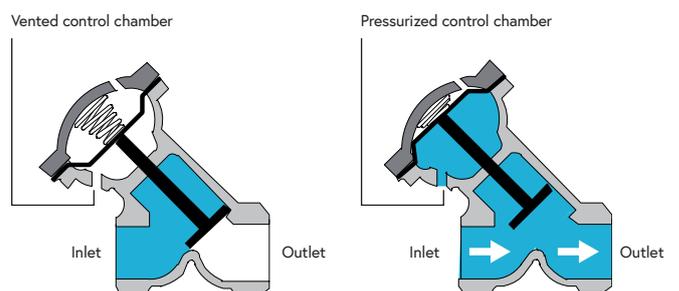
Normally Open Model



Normally Closed Model (Normal Flow)

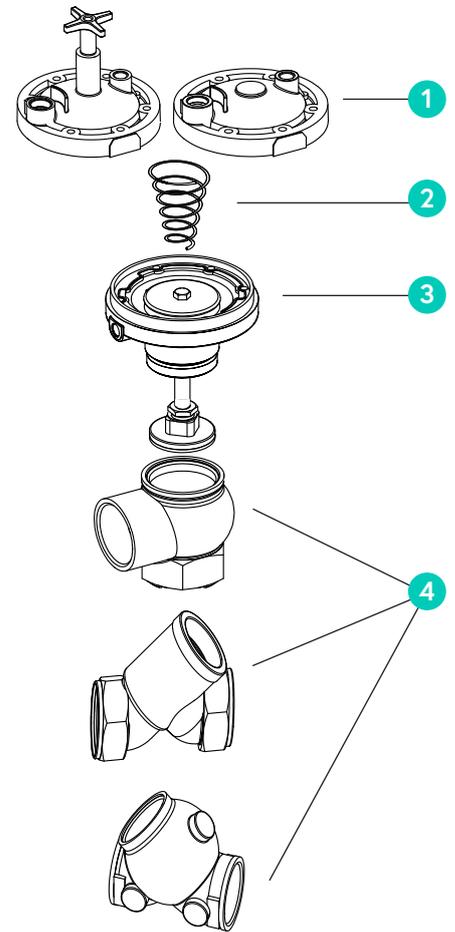


Normally Closed Model (Reverse Flow)



Main parts

No.	Part
1	Bonnet
2	Spring
3	Operator kit
4	Body



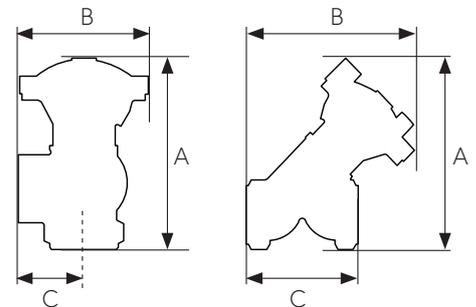
Materials

#	Part	Standard	High Pressure	Hot Water	Seawater*
1	Body	Brass	Brass	Brass	SST 316
2	Bonnet	PAGF	AL	AL	SST 316
3	Actuator housing	PAGF	Brass	Brass	SST 316
4	Shaft	SST 302	SST 302	SST 302	SST 316
5	Spring	SST 302	SST 302	SST 302	SST 316
6	Screws	Steel	Steel	Steel	SST 316
7	Seals	NR	NR	Viton / EPDM	NR
8	Diaphragm	NR	NR	EPDM	NR

* In Angle pattern only

Dimensions

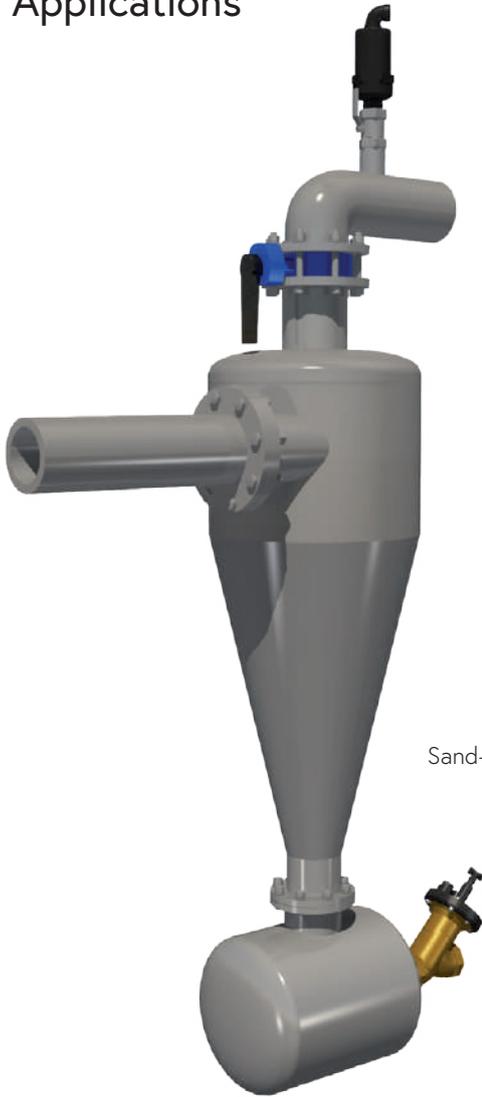
Model	Type	Dimensions mm / inch			Weight Kg / Lbs
		A	B	C	
09	Straight	196 / 7 ¹¹ / ₁₆	193 / 7 ⁵ / ₈	125 / 4 ¹⁵ / ₁₆	3.2 / 7
09 + throttling handle	Straight	235 / 9 ¹ / ₄	219 / 8 ⁵ / ₈	125 / 4 ¹⁵ / ₁₆	
09-A	Angle	192 / 7 ⁹ / ₁₆	130 / 5 ¹ / ₈	66 / 2 ⁵ / ₈	
09-A + throttling handle	Angle	260 / 10 ¹ / ₄	130 / 5 ¹ / ₈	66 / 2 ⁵ / ₈	



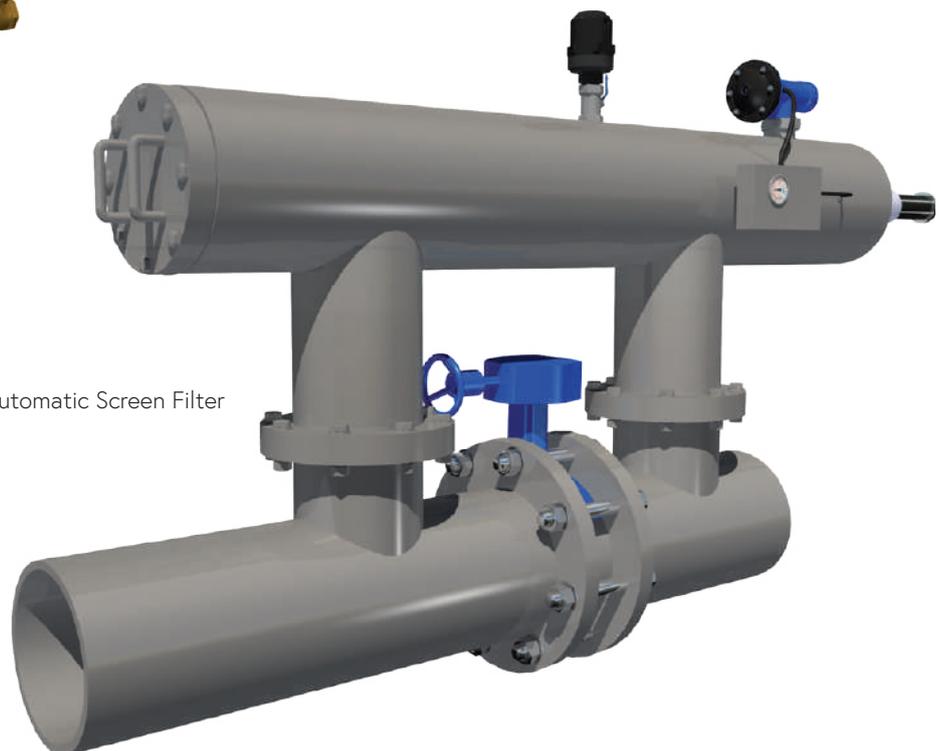
End connections

Threaded connections: Female - NPT / BSP

Applications



Sand-Separator (Hydrocyclone) System



Automatic Screen Filter

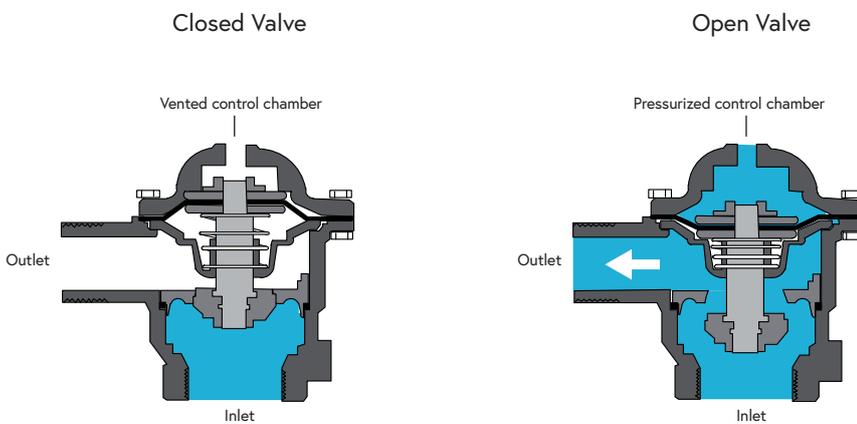
Normally-closed, Polymeric Back-flushing Valve

Features

- High resistance to corrosive fluids
- Normally-closed operation
- Fast reaction
- Easy installation and maintenance
- Tough and durable construction
- Drip-tight sealing at zero pressure
- Angle pattern minimizes pressure losses



Operating principle

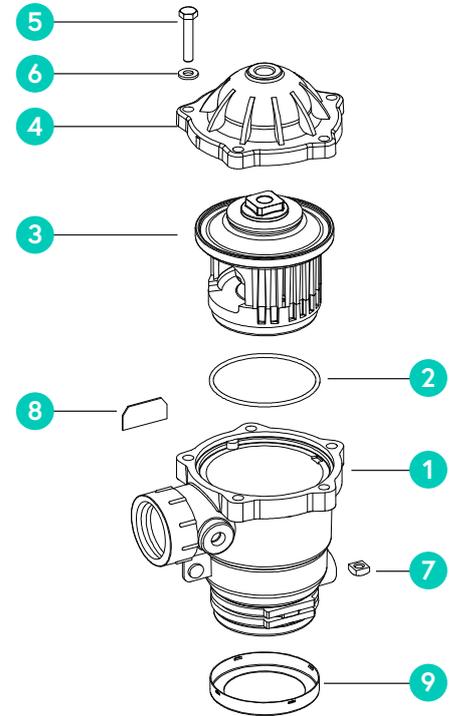


Main parts

No.	Part
1	Body
2	O-ring
3	Diaphragm assembly
4	Bonnet
5	Bolt
6	Washer
7	Nut
8	ID Plate
9	Ring

Materials

Part	Standard	Mining
Body	PPGF	PPGF
Bonnet	PPGF	PPGF
Shaft	PPGF	PPGF
Spring	SST 302	SST 316
Screws	SST 304	SST 304
Seals	EPDM	ALD and Viton
Diaphragm	EPDM	ALD

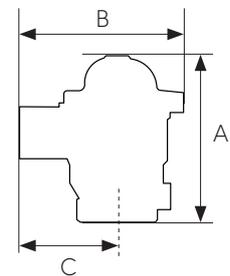


Dimensions

Size	Dimensions mm / inch			Weight Kg / Lbs
	A	B	C	
40mm / 1.5"	164 / 6 ⁷ / ₁₆	127 / 5	89 / 3 ¹ / ₂	0.7 / 1.6

End connections

Threaded connections: Inlet Female, Outlet Male - NPT / BSP



Hydraulic performance

Size		1 1/2" / 40mm
Max. recommended flow rate	m ³ /h	25
	gpm	110
Flow rate factor	Kv (metric)	25
	Cv (US)	30

Operating pressure range:

Standard model: 0.4-8 bar / 6-115 psi

Maximal operating temperature: 60°C (140°F)

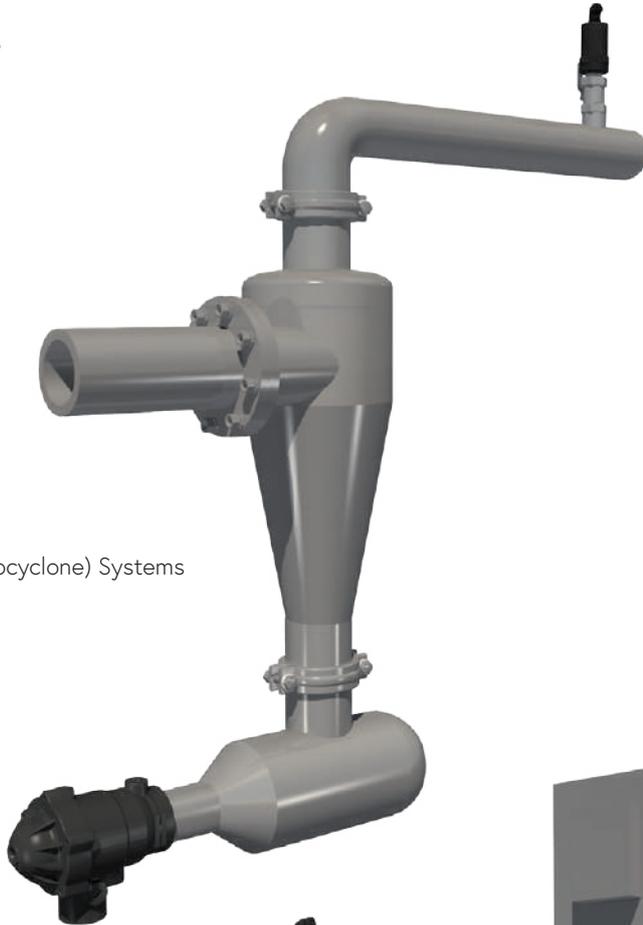
Minimal command pressure: 0.4 bar, to be at least 60% of line pressure

Ordering guide

Ordering data	Ordering code			Ordering data
	60-ANC	□□	□□	
Connection standard				Special features
NPT	→	NP	ST	Standard
BSP	→	BS	MI	Mining

Applications

Sand Separator (Hydrocyclone) Systems



Automatic Screen / Disc Filters





Directing the Flow

Advanced hydraulic solutions for optimal management of liquid conveyance systems

Aquestia is a world leader in providing optimal solutions for surge protection, water loss reduction and pressure management, by integrating uniquely developed products with innovatively designed software. Bringing together three strong brands - A.R.I., DOROT and OCV – we combine decades of experience, a wealth of knowledge and expertise, and a wide range of solutions and services. We are where liquid flows, serving customers in segments that include waterworks and wastewater systems, irrigation, fire protection, mining, ballast water, desalination, commercial plumbing, aviation fueling, oil & gas, and more.

Aquestia – high-quality, reliable products and committed service - for your peace of mind.