

Automatic Control Valve Schematic

LEAD FREE*

LFF6115-7JM (Globe)

Pressure Reducing Control Valve with Downstream Surge Control Feature

Features

- Designed for retrofit applications with compact 12¼ laying length
- Throttles to reduce high upstream pressure to constant lower downstream pressure
- Closes quickly when downstream pressure exceeds reduced pressure setpoint
- Ideal for use when high capacity on-off equipment is installed downstream
- Reducing and Surge Control setpoints are separately adjustable
- 4" Reduced Port ANSI 150# Flanged

Standard Components

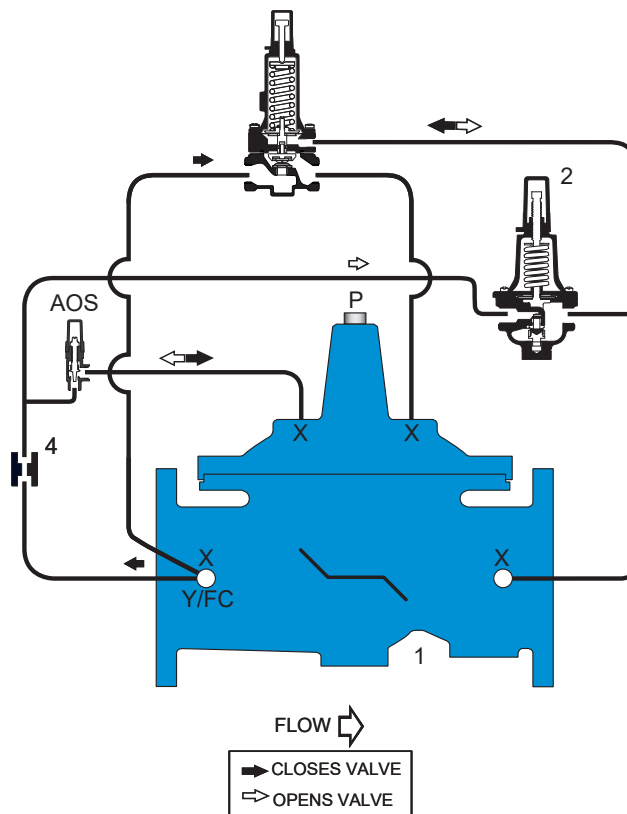
- 1—Main Valve (LF6100 - Single Chamber)
- 2—Pressure Reducing Control
- 3— Downstream Surge Control
- 4— Fixed Orifice
- X—Isolation Cocks
- FC—Flo-Clean Strainer
- AOS—Adjustable Opening Speed
- P—Position Indicator

Options and Accessories

- Y—Y-Strainer (Replaces Flo-Clean)

Operation

The Combination Pressure Reducing and Surge Automatic Control Valve is designed to automatically reduce a fluctuating higher upstream pressure to a constant lower downstream pressure, and will quickly modulate toward a closed position if downstream pressure suddenly becomes greater than the desired regulated setpoint. The quick closing action prevents possible damaging high inlet pressure from passing through the valve to downstream piping. Normal regulating action is controlled by a normally open, pressure reducing pilot designed to: 1) Open (allowing fluid out of the main valve cover chamber) when downstream pressure is below the adjustable setpoint, and 2) Close (allowing fluid to fill the main valve cover chamber) when downstream pressure is above the adjustable setpoint. A



decrease in downstream pressure causes the valve to modulate toward an open position, raising downstream pressure. An increase in downstream pressure causes the valve to modulate toward a closed position, lowering downstream pressure.

If downstream pressure suddenly becomes greater than the desired regulated setpoint, the normally closed surge control pilot opens and rapidly admits higher inlet pressure into the valve cover, increasing rate of valve closure. Normal pressure reducing operation resumes when downstream pressure decreases below the desired regulated setpoint.

*The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.

NOTICE

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

Watts product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact Watts Technical Service. Watts reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Watts products previously or subsequently sold.

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LFF6100-JM

4" Reduced Port ANSI 150# Ductile Iron Single Chamber Basic Valve

This Watts Automatic Control Valve (ACV) Model LF6100-JM, is a reduced port, single chamber basic valve that incorporates a one-piece disc and diaphragm assembly. This assembly is the only moving part within the valve allowing it to open, close, or modulate as commanded by the pilot control system.

Watts ACV Main Valves are Lead Free. The Watts ACV piloting system contains Lead Free* components, ensuring all of our configurations are Lead Free compliant.

Model LF6100-JM - Globe Pattern Single Chamber Basic Valve

Standard Materials

- Body and Cover:** Ductile Iron ASTM A536
- Coating:** NSF Listed Fusion Bonded Epoxy Lined and Coated
- Trim:** 316 Stainless Steel
- Elastomers:** Buna-N (standard)
EPDM (optional)
Viton® (optional)
- Nut, Spring and Stem:** Stainless Steel
- Anti-Scale (Optional):** Xylan Coated Stem and Seat

Viton® is a registered trademark of DuPont Dow Elastomers.

Operating Pressure

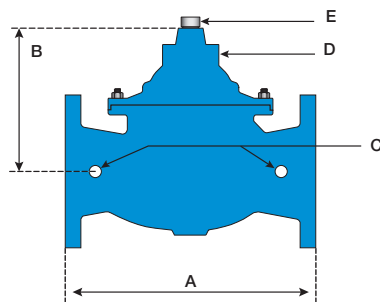
150# Flanged = 250psi (17.2 bar)

Operating Temperature

- Buna-N: 160°F (71°C) Maximum
- EPDM: 300°F (140°C) Maximum
- Viton®: 250°F (121°C) Maximum
- Epoxy Coating**: 140°F (60°C) Maximum

** Valves can be provided without internal epoxy coating consult factory

Dimensions



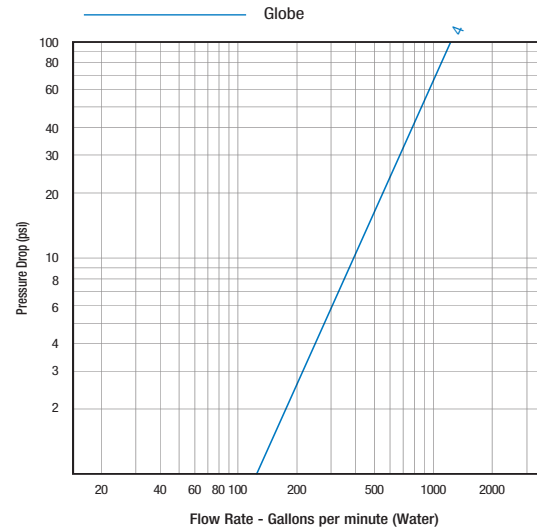
Valve Size	Globe 150#		Cover To Center		Port Size NPT	Port Size NPT	Port Size NPT	Shipping Weights*	
	A	B	C	D	E			lbs.	kgs.
in.	in.	mm	in.	mm	in.	in	in.		
4	12¼	311	7	178	½	¾	½	125	57

Flow Data

Valve Size - Inches		4
Suggested	Maximum Continuous Flow Rate Gpm (Water)	460
	Maximum Intermittent Flow Rate Gpm (Water)	570
	Minimum Flow Rate Gpm (Water)	15
Cv	CV Factor GPM (Globe)	125

- Maximum continuous flow based on velocity of 20 ft. per second.
- Maximum intermittent flow based on velocity of 25 ft. per second.
- Minimum flow rates based on a 20-40 psi pressure drop.
- The Cv Factor of a valve is the flow rate in US GPM at 60°F that will cause a 1psi drop in pressure.
- Cv factor can be used in the following equations to determine Flow (Q) and Pressure Drop (ΔP):

$$Q \text{ (Flow)} = C_v \sqrt{\Delta P} \quad \Delta P \text{ (Pressure Drop)} = (Q/C_v)^2$$
- The Cv factors stated are based upon a fully open valve.
- Many factors should be considered in sizing control valves including inlet pressure, outlet pressure and flow rates.
- For sizing questions including cavitation analysis consult Watts with system details.



Valve Cover Chamber Capacity

Valve Size - Inches	4
fl.oz.	10
U.S. Gal	

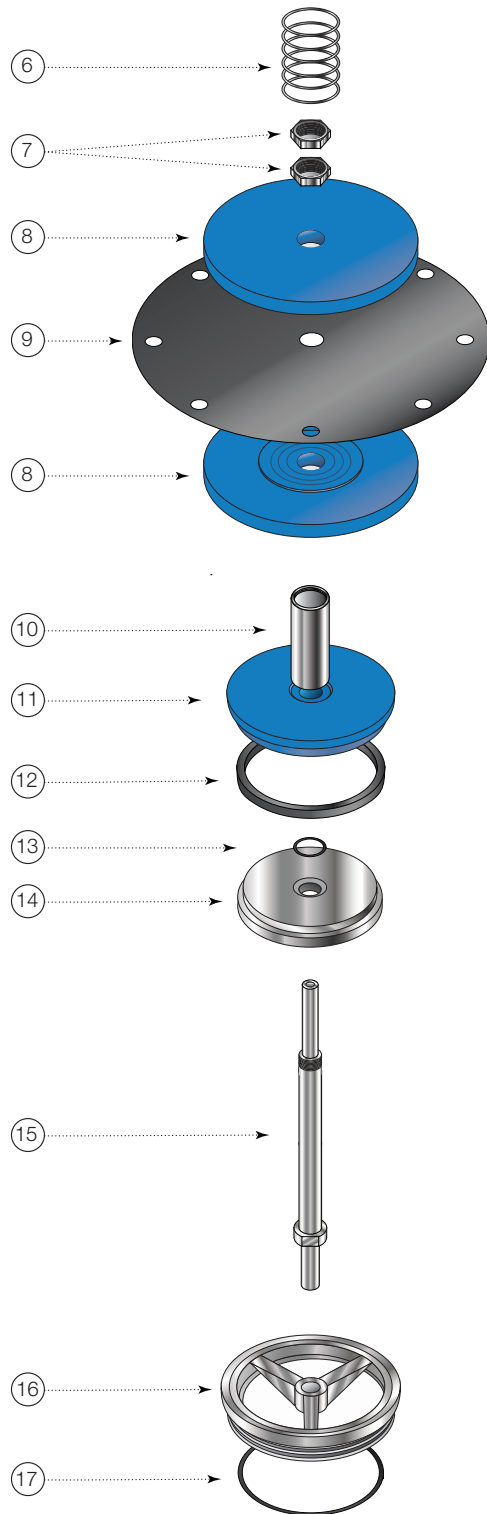
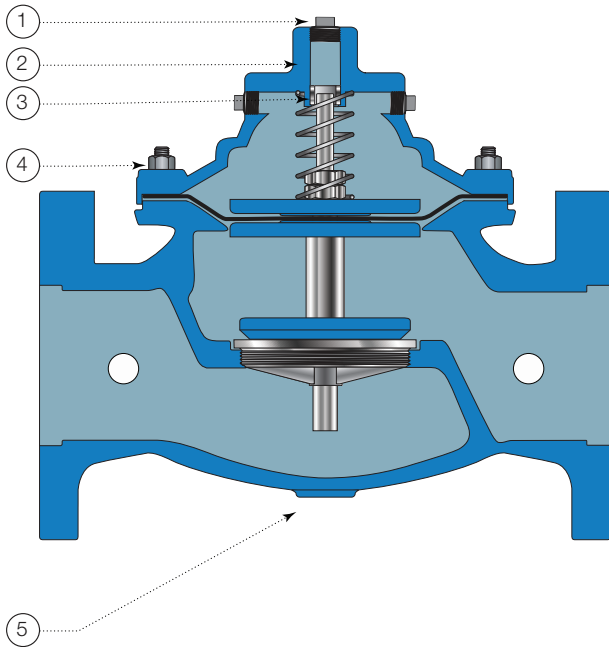
Valve Travel

Valve Size - Inches	4
Travel - Inches	¾

Classic Series Basic Valve

LFF6100-JM

4" Reduced Port ANSI 150# Ductile Iron Single Chamber Basic Valve



Item	Description	Material
1	Pipe Plug	Lead Free Brass
2	Cover	ASTM A536 65-45-12 Epoxy Coated Ductile Iron
3	Cover Bearing	ASTM A276 304 Stainless Steel
4	Stud with Cover Nut and Washer	ASTM A570 Gr.33 Zinc Plated Steel
5	Body	ASTM A536 65-45-12 Epoxy Coated Ductile Iron
6	Spring	ASTM A276 302 Stainless Steel
7	Stem Nut	ASTM A276 304 Stainless Steel
8	Diaphragm Washer	ASTM A536 65-45-12 Epoxy Coated Ductile Iron
9	Diaphragm*	Buna-N (Nitrile)
10	Spacer	ASTM A276 304 Stainless Steel
11	Quad Seal Retainer	ASTM A536 65-45-12 Epoxy Coated Ductile Iron
12	Quad Seal*	Buna-N (Nitrile)
13	O-Ring*	Buna-N (Nitrile)
14	Quad Seal Plate	ASTM A743 CF8M (316) Stainless Steel
15	Shaft / Stem	ASTM A276 304 Stainless Steel
16	Seat Ring	ASTM A743 CF8M (316) Stainless Steel
17	Seat Gasket*	Buna-N (Nitrile)

* Contained in Main Valve Repair Kit

NOTICE

Installation: If unit is installed in any orientation other than horizontal (cover up) OR extreme space constraints exist, consult customer service prior to or at the time of order.

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Model LFCP15

Pressure Reducing Pilot

Size: 3/8" NPT

The Model LFCP-15 is a direct acting, diaphragm actuated Pilot that automatically reduces a higher upstream (inlet) pressure to a constant downstream (outlet) pressure. It is normally held open by the force of the adjustable spring setting above the diaphragm.

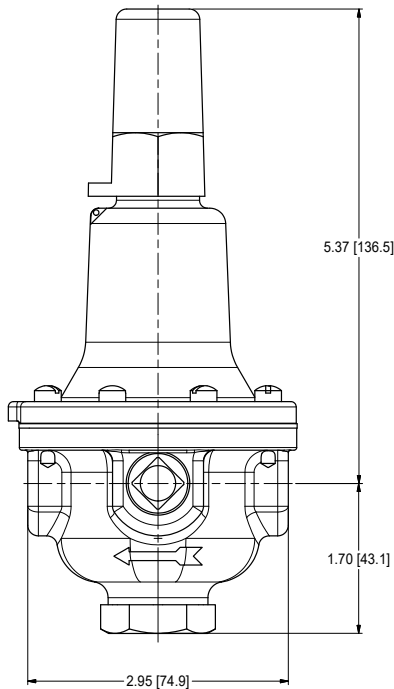
The Pilot modulates towards a closed position when outlet pressure exceeds the spring setpoint, lowering the delivery pressure. It modulates towards an open position when the outlet pressure falls below the spring setpoint, increasing the delivery pressure.

When a Model LFCP-15 is installed in the piping circuit of an Automatic Control Valve, its throttling action causes the Main Valve to throttle open or closed accordingly. Turning the adjustment screw clockwise raises the control setpoint, increasing main valve outlet pressure. Turning the adjustment screw counterclockwise lowers the control setpoint, decreasing Main Valve outlet pressure.

The Model LFCP-15 is equipped with one 3/8" NPT inlet and two outlet ports for ease of installation. The unused outlet port may be plugged or used as a pressure gauge connection.



Model LFCP15



Specifications

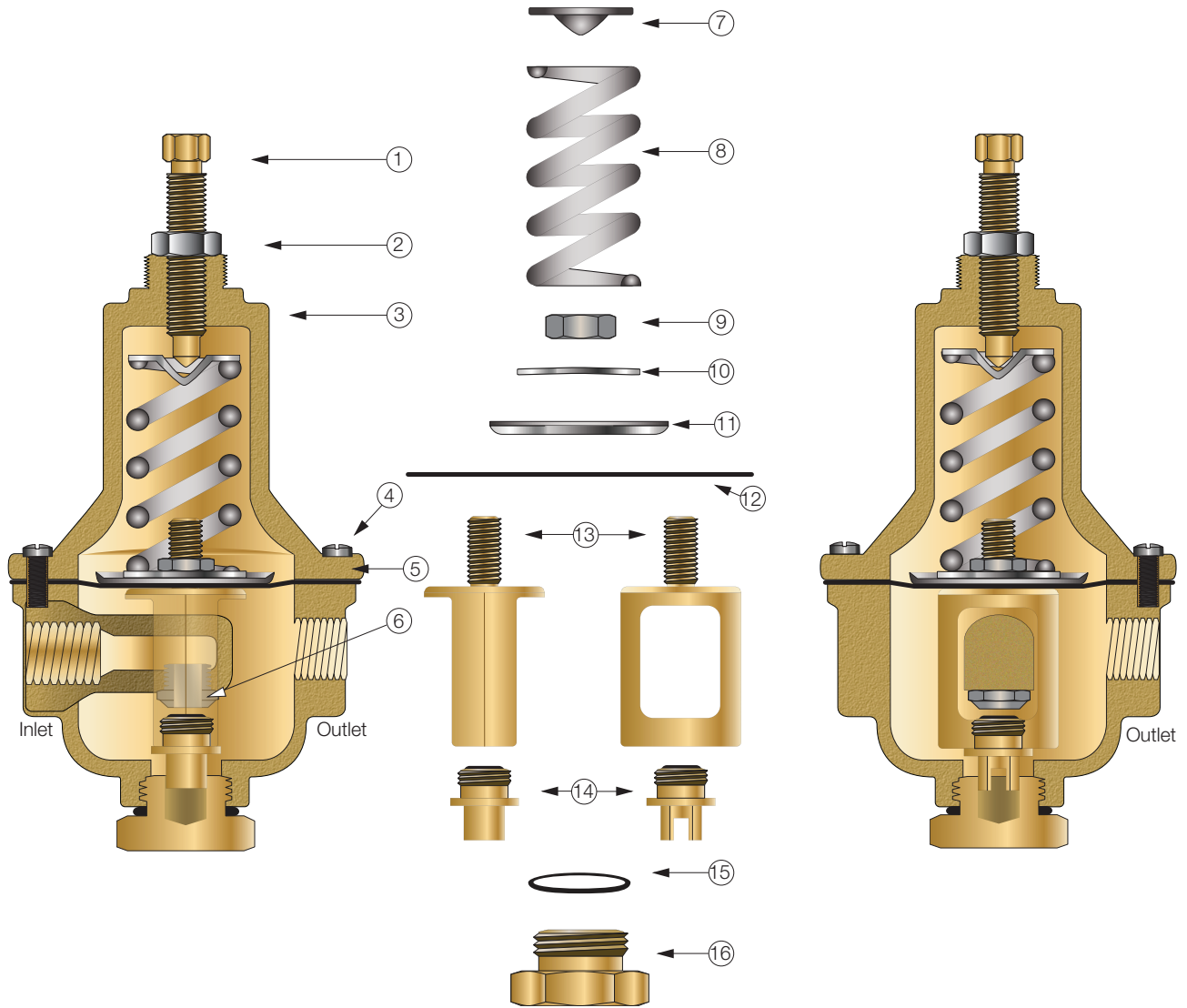
Body Material:	Lead Free Copper Silicon Alloy CF8M (316) Stainless Steel (optional)
Seat:	316 Stainless Steel
Elastomers:	Buna-N (standard) Viton® (optional) EPDM (optional)
Inlet Pressure Rating:	400psi (27.6 bar) maximum
Adjustment Range:	30-300psi (2.1 - 20.7 bar) (standard) 2-30psi (0.15-2 bar) (optional)

Viton® is a registered trademark of DuPont Dow Elastomers.

*The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.

Model LFCP15

Pressure Reducing Pilot



Item	Description
1	Adjusting Screw
2	Nut
3	Spring Housing
4	Cap Screw
5	Body
6	Seat
7	Spring Guide
8	Spring
9	Nut
10	Belleville Washer
11	Diaphragm Washer
12	Diaphragm*
13	Yoke
14	Disc and Retainer Assembly*
15	O-Ring*
16	Bottom Cap

*Included in Repair Kit

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Model LFPV20C

Pressure Relief, Sustaining or Backpressure Pilot

Size: 1/2" NPT

The Model LFPV20C is a remote sensed direct acting, diaphragm actuated Pilot that is used on various configurations of Automatic Control Valves.

It is normally held closed by the force of the adjustable spring setting above the diaphragm. It modulates toward an open position when control pressure, exerting force below the diaphragm, exceeds the spring setpoint, and modulates toward a closed position when the control pressure falls below the spring setpoint. The LFPV20C senses control pressure through a tapped port below the diaphragm. The large diaphragm-to-seat ratio allows it to open and close within tight pressure tolerances, accurately positioning the Main Valve.

Turning the adjustment screw clockwise raises the control setpoint. Turning the adjustment screw counterclockwise lowers the control setpoint.

The LFPV20C is equipped with one 1/2" NPT inlet and outlet port and a 1/4" NPT side sensing port located on the power chamber. The 1/4" side sensing port is used to monitor upstream or downstream pressure as required by specific valve function.



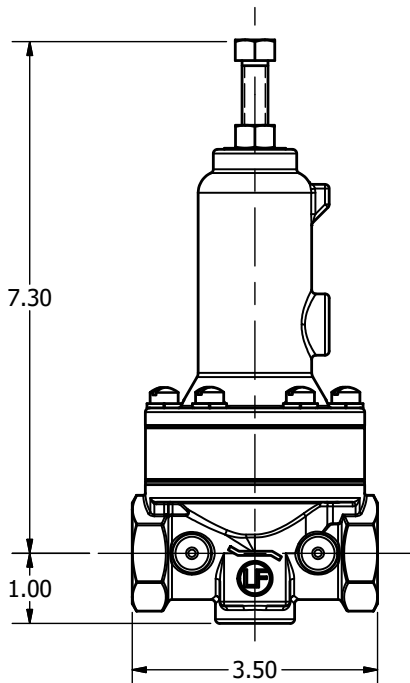
Model LFPV20C

Specifications

Body Material:	Lead Free Copper Silicon Alloy
Seat:	316 Stainless Steel
Elastomers:	Buna-N (standard) Viton® (optional) EPDM (optional)
Inlet Pressure Rating:	400psi (27.6 bar) maximum
Adjustment Rating:	20-200psi (1.4 - 13.8 bar) (standard) 0-30psi (0 - 2.1 bar) (optional) 100-300psi (6.9 - 20.7 bar) (optional) 200-450psi (13.8 - 31.0 bar) (optional)

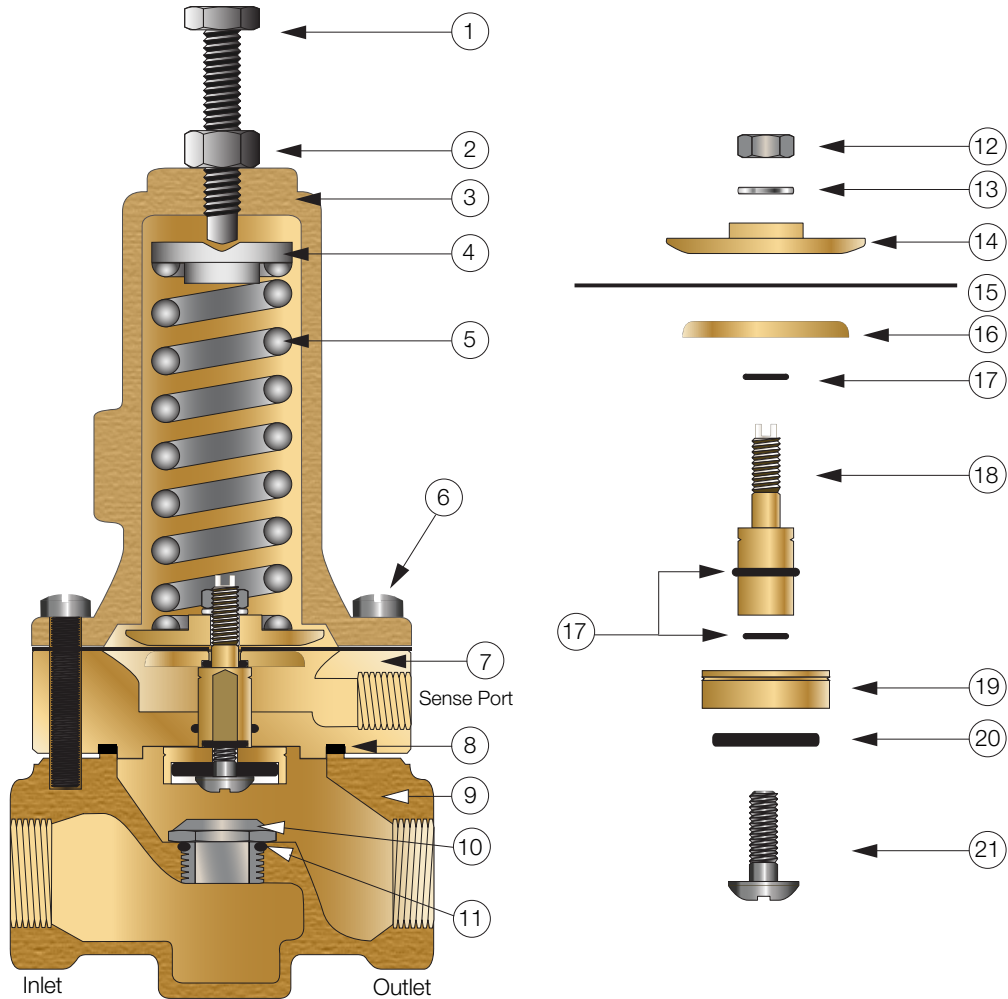
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Model LFPV20C

Pressure Relief, Sustaining or Backpressure Pilot



Item	Description
1	Adjusting Screw
2	Jam Nut
3	Spring Housing
4	Spring Guide
5	Spring
6	Cap Screw
7	Power Chamber
8	O-Ring*
9	Body
10	Seat
11	O-Ring*

Item	Description
12	Nut
13	Lockwasher
14	Diaphragm Washer
15	Diaphragm*
16	Diaphragm Washer
17	O-Ring*
18	Stem
19	Retainer
20	Rubber Disc*
21	Screw

*Included in Repair Kit

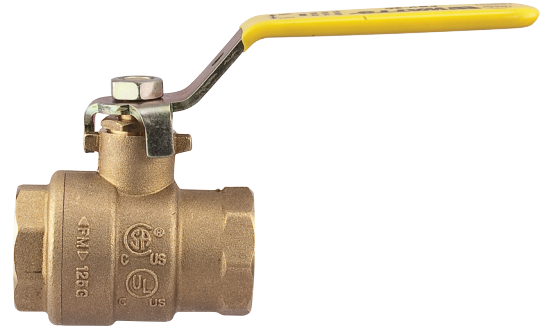
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Model BV

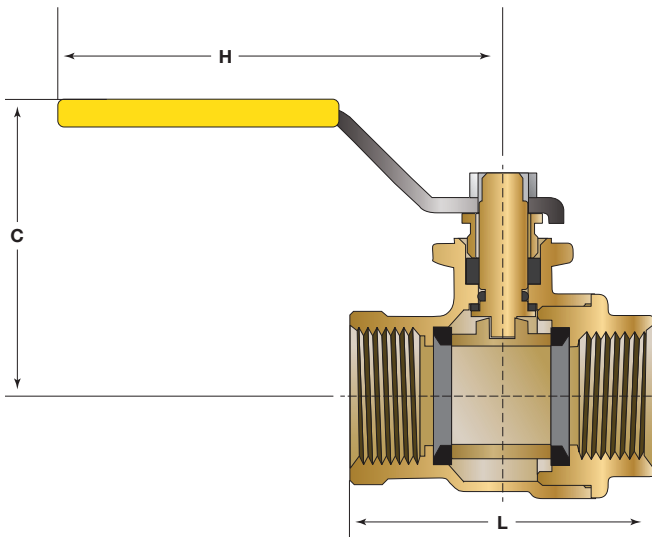
Ball Valve

Size: 1/4" – 1" NPT

Model BV Ball Valves are used in pilot lines to provide a positive shutoff in any override or maintenance situation for simple trouble shooting. This 2-piece, full port valve features: bottom loaded stems, PTFE seats and packing.



Lead Free Ball Valve



Specifications

Standard Material: Copper Silicon Alloy Body and Adaptor
Chrome Plated Ball

Optional Material: Stainless Steel Housing, Body and
Adaptor Stainless Steel Ball

Pressure Rating: 600psi (41 bar) Non Shock

Temp Rating: -40°F – 400°F

*The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.

Size	Dimensions						Weight	
	C		H		L		lbs.	kg.
in.	in.	mm	in.	mm	in.	mm		
1/4	1 13/16	46	3 7/16	87	1 3/4	45	0.4	0.2
3/8	1 13/16	46	3 7/16	87	1 3/4	45	0.4	0.2
1/2	1 13/16	46	3 7/16	87	1 5/16	50	0.4	0.2
3/4	2 1/4	57	4	101	2 5/16	59	0.8	0.3

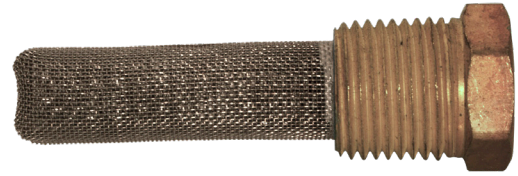
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Model LF60

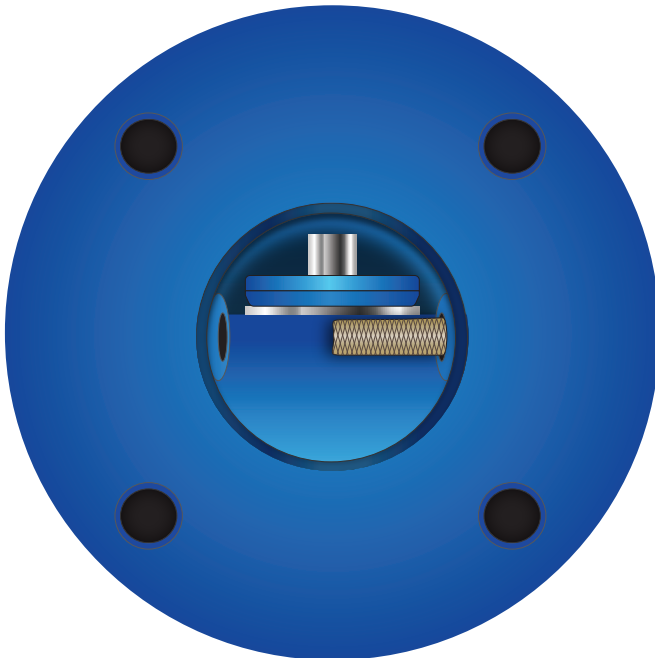
Flo-Clean Strainer

Size: 1/4" – 3/4" NPT

Model LF60 Flo-Clean Strainers are used to filter the fluid passing through the pilot circuit, and provide protection to pilot circuit speed controls and pilots. It is installed in the inlet body port of the Main Valve, exposing the strainer element to main line flow. The currents and flow across the screen create a self-scouring effect, cleaning the filter element.

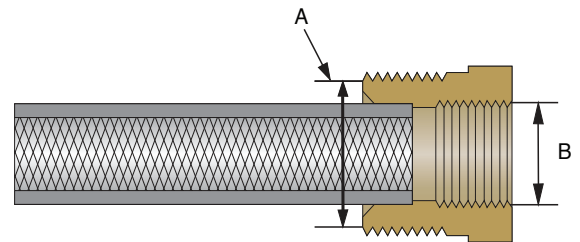


Valve inlet with Filter installed



Specifications

Body Material:	Lead Free Brass (standard) Stainless Steel (optional)
Pressure Rating:	400psi (27.6 bar)
Filter Element:	Monel
Screen Mesh:	40 Mesh (standard)



A	B
<i>Male Pipe Thread</i>	<i>Female Pipe Thread</i>
in.	in.
1/4	1/8
3/8	1/4
1/2	3/8

*The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.

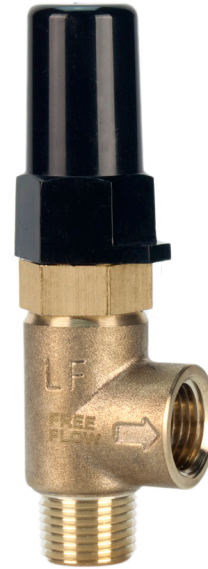
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Model LFFC

Flow Control

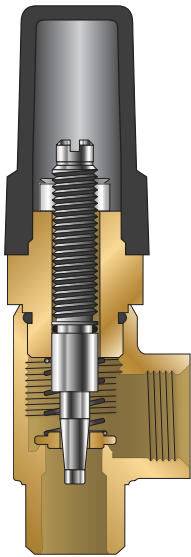
Size: 1/2" NPT

A Flow Control is an adjustable device used for tuning valve performance. It can be installed to either control the opening or closing the speed of the automatic control main valve. When the flow is in the direction of the needle the flow control is an adjustable restriction. In the free flow direction the seat moves out of the flow path to all unrestricted flow.

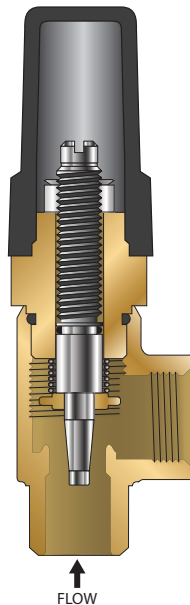


LF Flow Control

CLOSED
Fluid Speed
Controlled by Needle



OPEN
Free Flow
Seat Full Open



Specifications

Size: 1/2" NPT

Body Material: Lead Free Brass
Stainless Steel (optional)

Seat: Lead Free Brass

Needle: Stainless Steel (304)

Elastomers: Buna-N (standard)

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Model 50 Position Indicator

When specified as an option on a Control Valve, the Model 50 Position Indicator is installed in the topmost cover port of the Main Valve and allows for visual indication of valve position. The Model 50 is also very useful during valve start-up and troubleshooting procedures.

A stainless steel indicating rod threads into the tapped portion of the Main Valve stem and moves inside of a cylindrical Pyrex sight tube. The indicating rod travels up and down, following Main Valve stem movement. The housing protects the sight tube and indicating rod, and allows visibility on two sides. The screw driver operated test cock installed on the top of the Model 50 housing provides a controlled method of removal of air from the cover chamber during start-up or troubleshooting of the Main Valve.



Dimensions

Valve Size (in)	Dimension (in)
1¼ - 1½	7¾
2	4¾
2½	4¾
3	4¾
4	5
6	5
8	5¾
10	5¾
12	7¼
14	7¼
16	7¼
18*	7¼
20*	7¼
24*	7¼

*Reduced Port



Specifications

Standard Material: Stainless Steel Housing and Body
Stainless Steel Indicating Rod

Lead Free Test Cock
Pyrex Sight Tube

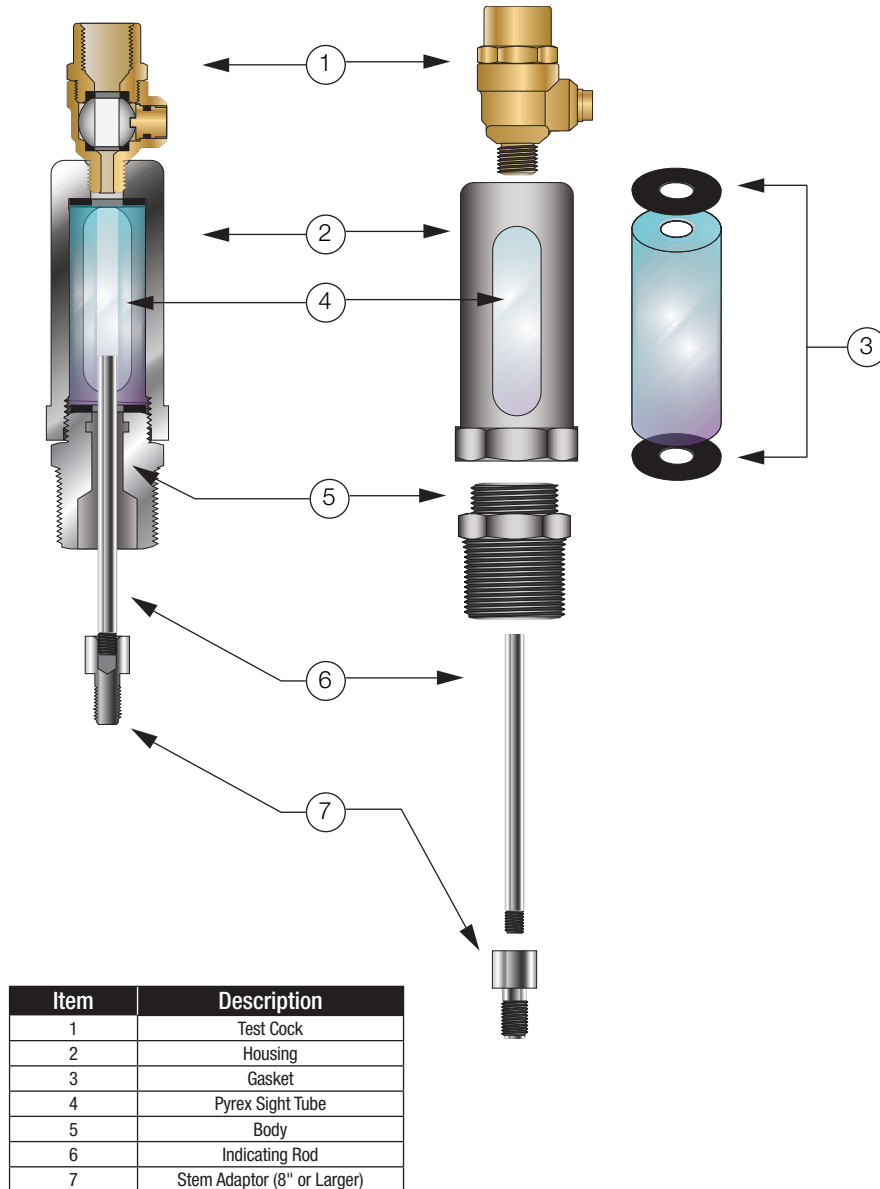
Optional Material: Stainless Steel Test Cock

Pressure Rating: 400psi (27.6 bar)

*The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.

Model 50

Position Indicator



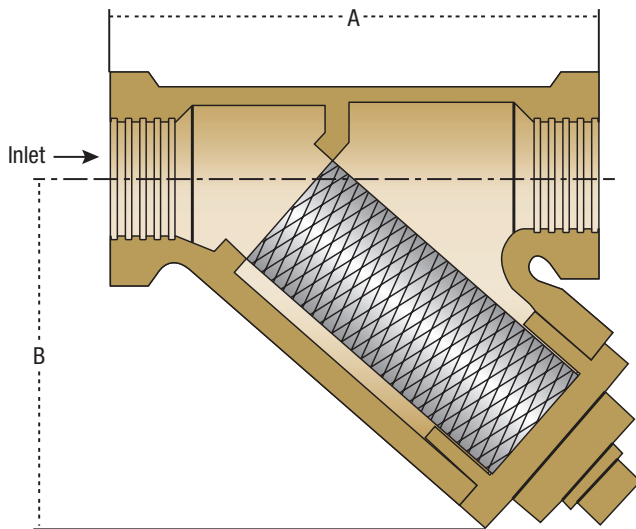
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Model LF60-1

Y-Pattern Strainer

Size: 1/4" – 3/4" NPT

Model LF60-1 Y-Pattern Strainers are used to filter the fluid passing through the pilot circuit, and provide protection to pilot circuit speed controls and pilots. The filter element can be accessed for cleaning by removing the clean-out cap, or may be cleaned by installing an optional "blow-down" ball valve.



Specifications

- Body Material:** Lead Free Copper Silicon Alloy
CF8M (316) Stainless Steel (optional)
- Retainer Cap:** Lead Free Copper Silicon Alloy
- Cap Gasket:** EPDM
- Pressure Rating:** 400psi (27.6 bar)
- Filter Element:** 304 Stainless Steel
- Mesh Options:** 60 Mesh (standard)
100 Mesh (optional)

*The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.

Dimensions

SIZE	DIMENSIONS				WEIGHT	
	A		B		lbs.	kgs.
in.	in	mm	in	mm		
1/4	2 1/16	68	1 1/16	43	1.7	0.77
3/8	2 1/16	68	1 1/16	43	1.7	0.77
1/2	3	76	2	51	1.7	0.77
3/4	3 5/16	84	2 5/16	59	1.7	0.77

