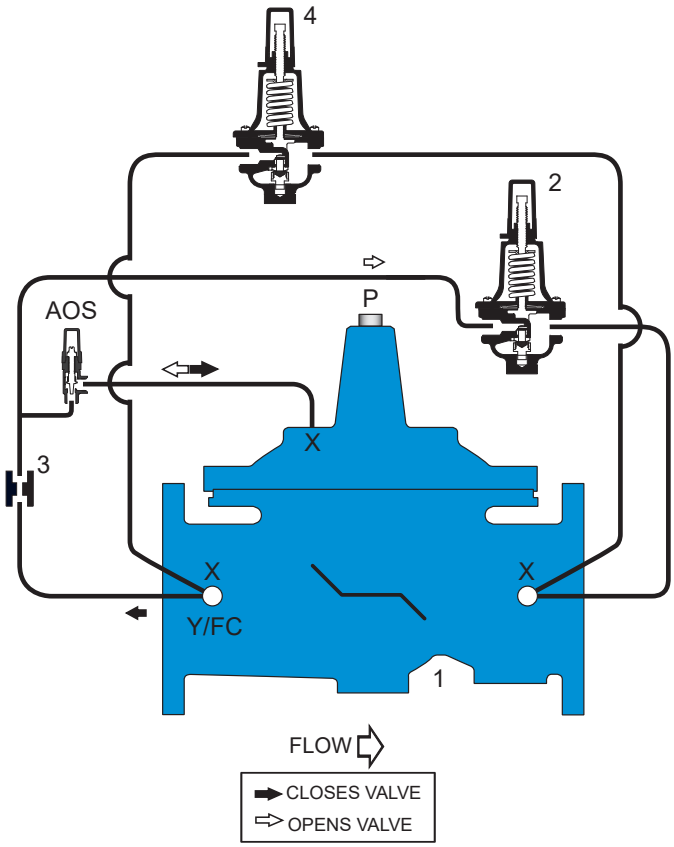
Automatic Control Valve Schematic

LEAD FREE*

LFF6115-74JM (Globe)

Pressure Reducing Control Valve with Low Flow By-Pass



Features

- Designed for retrofit applications with compact 12¼ laying length
- Throttles to reduce high upstream pressure to constant lower downstream pressure
- Low Flow By-Pass controls at low flows
- Main Line valve controls at high flows
- Reducing and Low Flow By-Pass setpoints are separately adjustable
- 4" Reduced Port ANSI 150# Flanged

Standard Components

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

Options and Accessories

O Y—Y-Strainer (Replaces Flo-Clean)

Operation

The Pressure Reducing Automatic Control Valve with Low Flow By-Pass is designed to automatically reduce a fluctuating higher upstream pressure to a constant lower downstream pressure regardless of varying flow rates. It 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.

A Low Flow By-Pass Valve is piped parallel to the Main Pressure Reducing Valve, and is set approximately 10 PSI higher. The Low Flow By-Pass handles flow requirements below the range of the Main Pressure Reducing Valve. During “off peak” demand conditions, the Low Flow By-Pass provides flow and pressure to the downstream zone. As flow requirements increase beyond the capacity of the Low Flow By-Pass, downstream pressure falls below the setpoint of the Main Pressure Reducing Valve allowing it to throttle toward open, supplementing flow and pressure. As flow requirements decrease, downstream pressure rises above the setpoint of the Main Pressure Reducing Valve, causing it to throttle toward closed, allowing the Low Flow By-Pass to resume command of flow and pressure.

***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.

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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

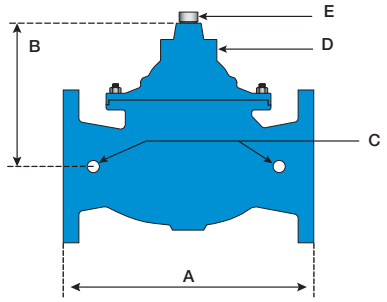
150# Flanged = 250psi (17.2 bar)

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



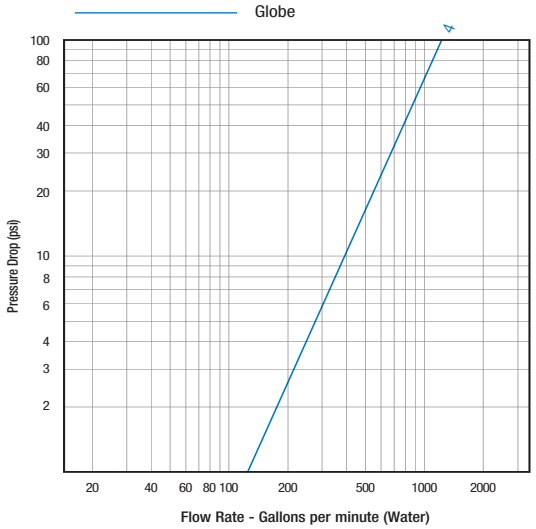
Valve Size	Globe 150#		Cover To Center		Port Size NPT	Port Size NPT	Port Size NPT	Shipping Weights*	
	A		B		C	D	E		
in.	*in.*	*mm*	*in.*	*mm*	*in.*	*in*	*in.*	*lbs.*	*kgs.*
4	12¼	311	7	178	½	⅜	½	125	57

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
C_v	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 C_v Factor of a value is the flow rate in US GPM at 60°F that will cause a 1psi drop in pressure.
- C_v factor can be used in the following equations to determine Flow (Q) and Pressure Drop (ΔP):

  $Q\ (Flow) = C_v\sqrt{\Delta P}$ $\Delta P\ (Pressure\ Drop) = (Q/C_v)^2$
- The C_v 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

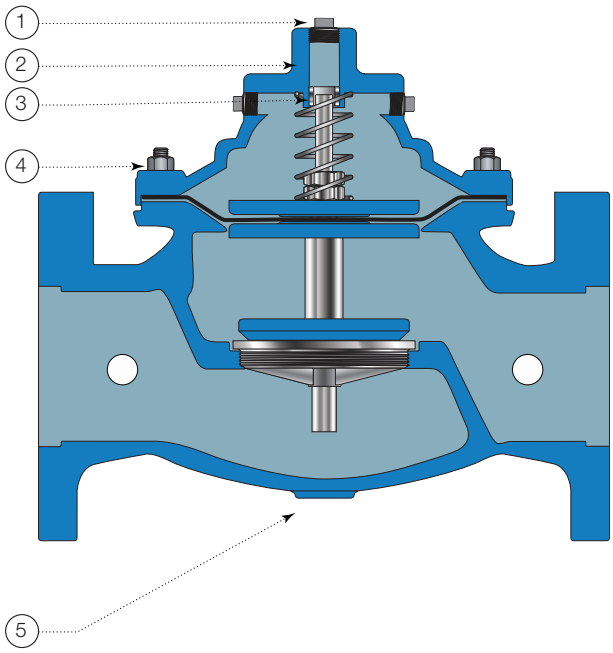
Valve Size - Inches	4
fl.oz.	10
U.S. Gal	

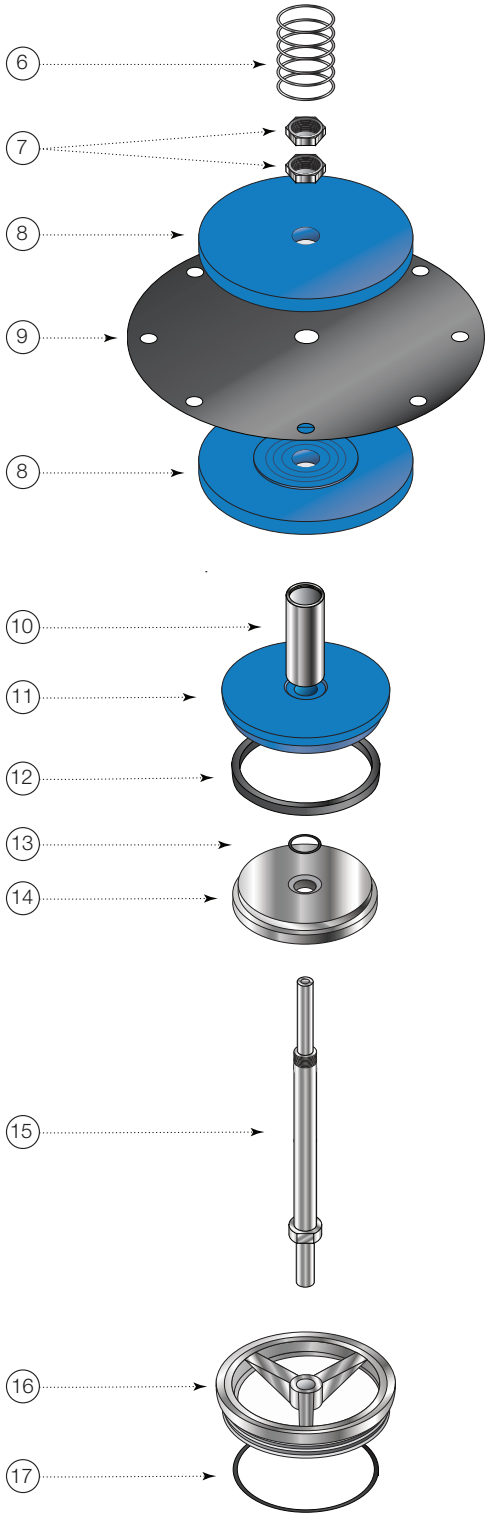
Valve Travel

Valve Size - Inches	4
Travel - Inches	¾

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: ⅜" NPT

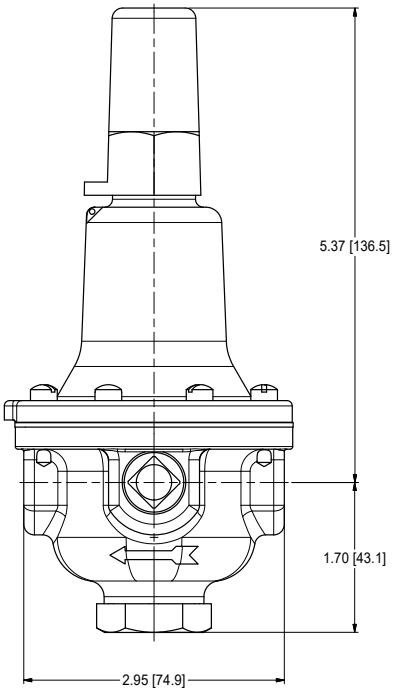
The Model LFCP-15 is a direct acting, diaphragm actuated Pilot that automatically reduces a higher upstream (inlet) pressure to a constant downstream (outlet) pressure. It is normally held open by the force of the adjustable spring setting above the diaphragm.

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 ⅜" 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

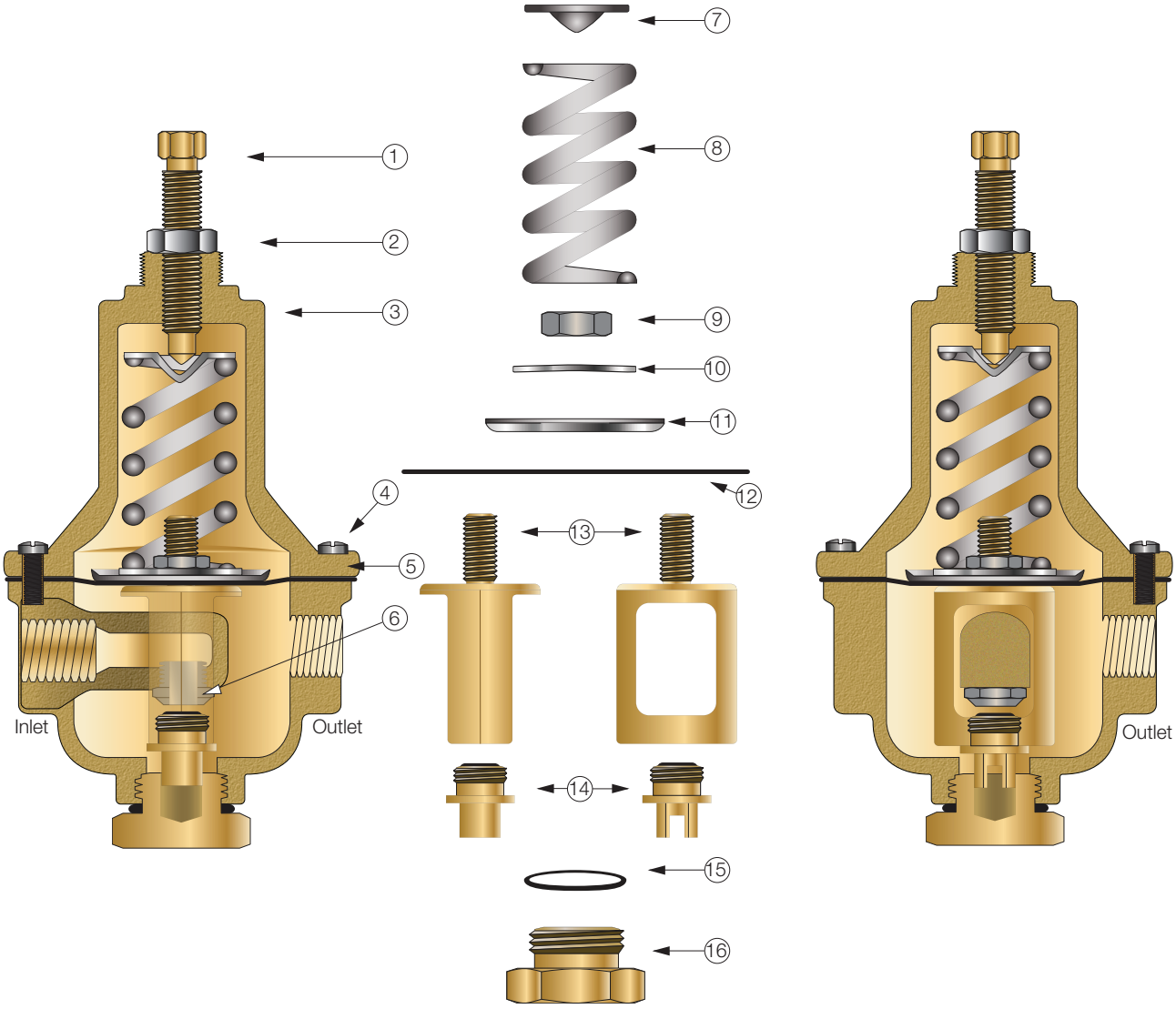
Body Material:	Lead Free Copper Silicon Alloy CF8M (316) Stainless Steel (optional)
Seat:	316 Stainless Steel
Elastomers:	Buna-N (standard) Viton® (optional) EPDM (optional)
Inlet Pressure Rating:	400psi (27.6 bar) maximum
Adjustment Range:	30-300psi (2.1 - 20.7 bar) (standard) 2-30psi (0.15-2 bar) (optional)

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*

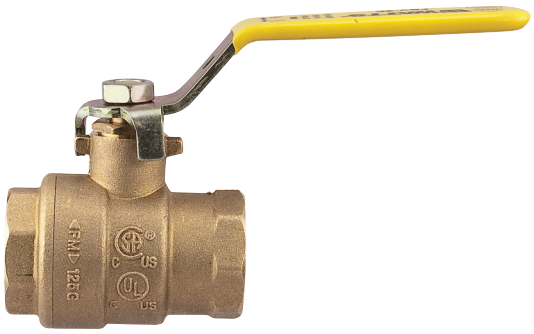
LEAD FREE*

Model BV

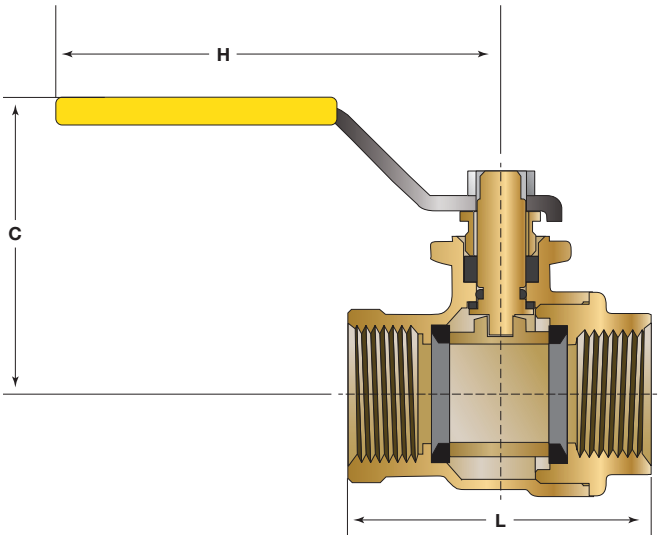
Ball Valve

Size: ¼" – 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



Size	Dimensions						Weight	
	C		H		L			
in.	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*lbs.*	*kg.*
¼	1 13/16	46	3 7/16	87	1 ¾	45	0.4	0.2
⅜	1 13/16	46	3 7/16	87	1 ¾	45	0.4	0.2
½	1 13/16	46	3 7/16	87	1 15/16	50	0.4	0.2
¾	2 ¼	57	4	101	2 5/16	59	0.8	0.3

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.**

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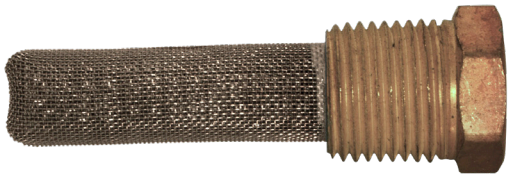
Model LF60

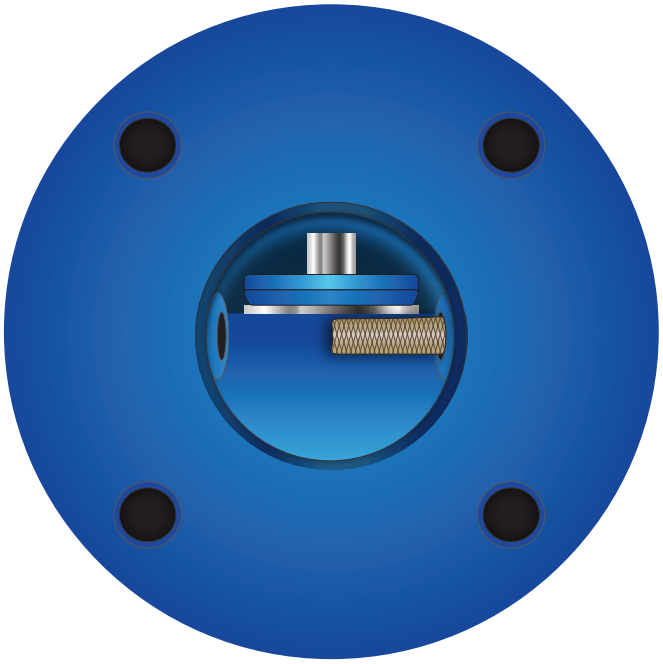
Flo-Clean Strainer

Size: ¼" – ¾" 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.

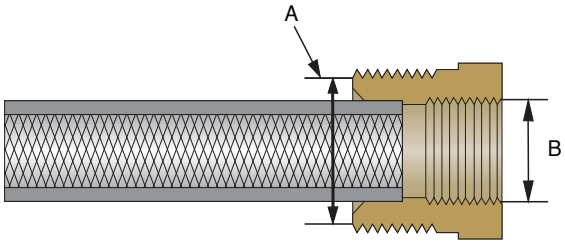


Valve inlet with Filter installed



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
Male Pipe Thread	*Female Pipe Thread*
in.	in.
¼	⅛
⅜	¼
½	⅜

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LEAD FREE*

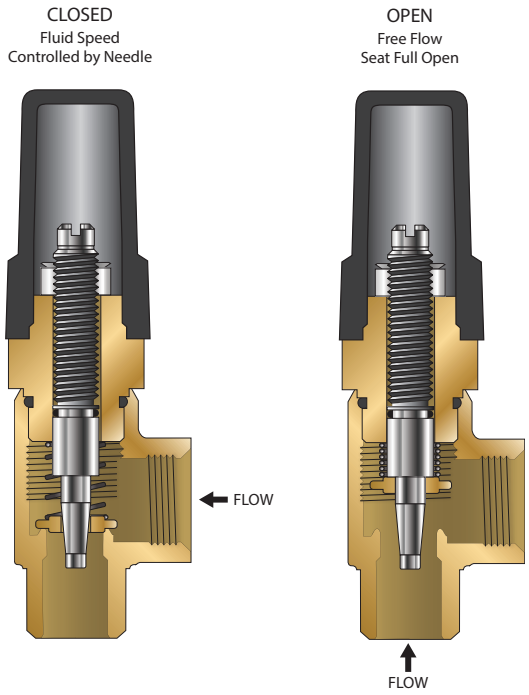
Model LFFC

Flow Control

Size: ½" 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



Specifications

Size:	½" 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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LEAD FREE*

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	7⅜
2	4⅞
2½	4⅞
3	4⅞
4	5
6	5
8	5⅞
10	5⅞
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)

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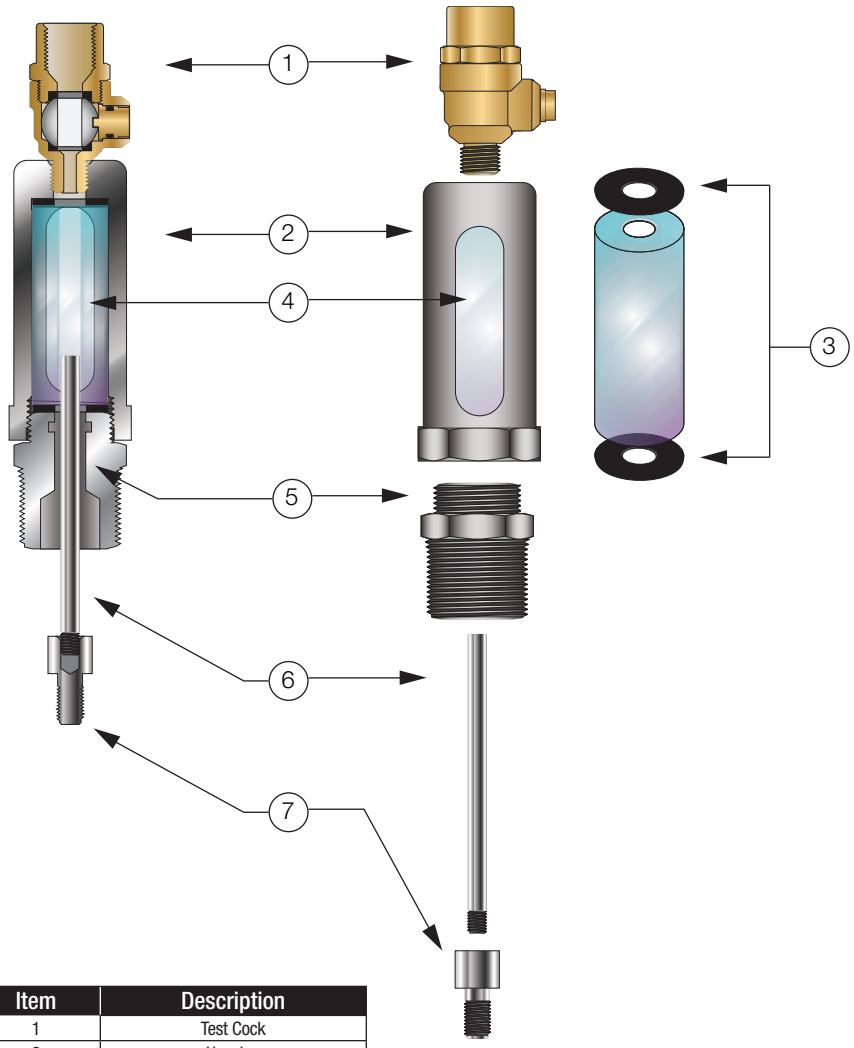
Model 50
Position Indicator



Item	Description
1	Test Cock
2	Housing
3	Gasket
4	Pyrex Sight Tube
5	Body
6	Indicating Rod
7	Stem Adaptor (8" or Larger)

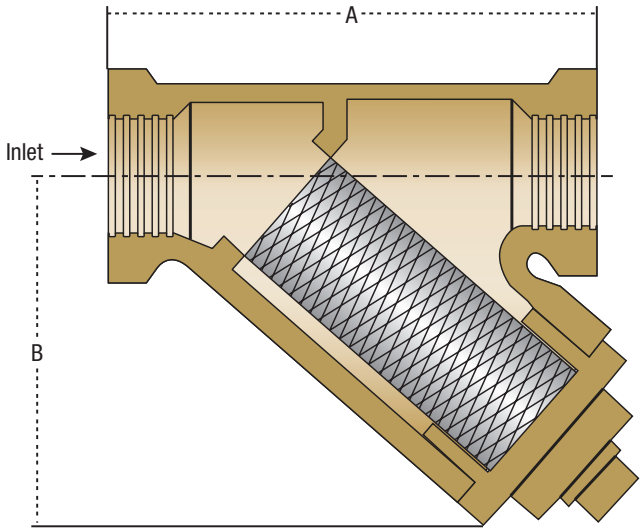
LEAD FREE*

Model LF60-1

Y-Pattern Strainer

Size: ¼" – ¾" 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			
in.	in	mm	in	mm	lbs.	kgs.
¼	2 11/16	68	1 11/16	43	1.7	0.77
⅜	2 11/16	68	1 11/16	43	1.7	0.77
½	3	76	2	51	1.7	0.77
¾	3 5/16	84	2 5/16	59	1.7	0.77

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