LF Actuators, On/Off

Models

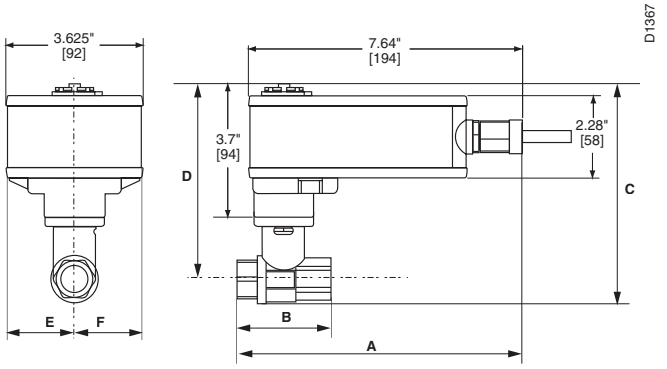
LF24 US
LF24-S US w/built-in Aux. Switch
LF120 US
LF120-S US w/built-in Aux. Switch

Technical Data		
Control		on/off, floating point
Power supply		
LF24(-S) US		24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
LF120(-S) US		120 VAC ± 10% 50/60 Hz
Power consumption		
LF24(-S) US	running	5 W
	holding	2.5 W
LF120(-S) US	running	5.5 W
	holding	3.5 W
Transformer sizing		
LF24(-S) US		7 VA, class 2 power source
LF120(-S) US		7.5 VA, class 2 power source
Electrical connection (-S models have 2 cables)		½" conduit connector 3 ft [1m], 18 GA appliance cable
Electrical protection		120V actuators double insulated
Overload protection		electronic throughout rotation
Angle of rotation		95°
Spring return direction		reversible with CW/CCW mounting
Position indication		visual indicator 0° to 90°
Running time	motor	<40 to 75 seconds (on/off)
	spring	<25 sec. @-4°F to 122°F [-20°C to 50°C] <60 sec. @-22°F [-30°C]
Ambient temperature		-22° F to 122° F [-30° C to 50° C]
Housing		NEMA 2
Agency listings†		cULus according to UL 873 and CAN/CSA C22.2 No. 24-93
Noise level (max)	running	<30 db(A)
	spring return	62 dB(A)
Quality standard		ISO 9001

LF…-S US	
Auxiliary switch	1 x SPDT, 6A (1.5A) @ 250 VAC, UL Listed, adjustable 0° to 95° (double insulated)

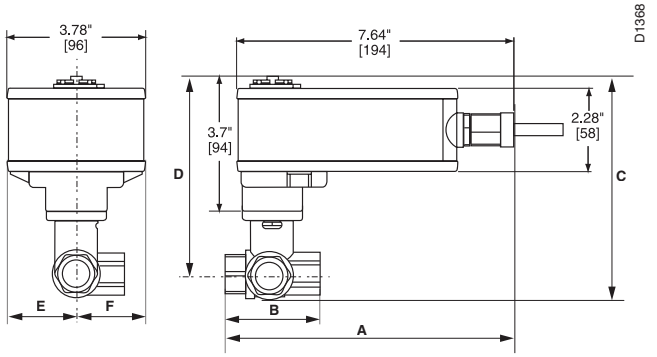
† Rated impulse voltage 800V (4kV for 120V model), Control pollution degree 3, Type of action 1.AA (1.AA.B for -S models)

Dimensions with 2-Way Valve



	Valve Nominal Size		Dimensions (Inches [mm])	
Valve Body	Inches	DN [mm]	A	B
B207(B)-B211(B)	½"	15	2.41" [61.1]	1.39" [35.2]
B212(B)-B215(B)	½"	15	2.38" [60.4]	1.78" [45.2]
B217(B)-B220(B)	¾"	20	2.73" [69.3]	1.87" [47.4]
B222-B225	1"	25	3.09" [78.4]	1.87" [47.4]
B229-B230	1¼"	32	3.72" [94.6]	1.87" [47.4]

Dimensions with 3-Way Valve



	Valve Nominal Size		Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	A	B	C
B307(B)-B311(B)	½"	15	2.41" [61.1]	1.39" [35.2]	1.20" [30.6]
B312(B)-B315(B)	½"	15	2.38" [60.4]	1.78" [45.2]	1.29" [32.8]
B317(B)-B320(B)	¾"	20	2.73" [69.3]	1.87" [47.4]	1.47" [37.3]
B322-B325	1"	25	3.09" [78.4]	1.87" [47.4]	1.59" [40.3]

Wiring Diagrams

INSTALLATION NOTES

1 Provide overload protection and disconnect as required.

2 ***CAUTION** Equipment damage!*
Actuators may be connected in parallel.
Power consumption must be observed.

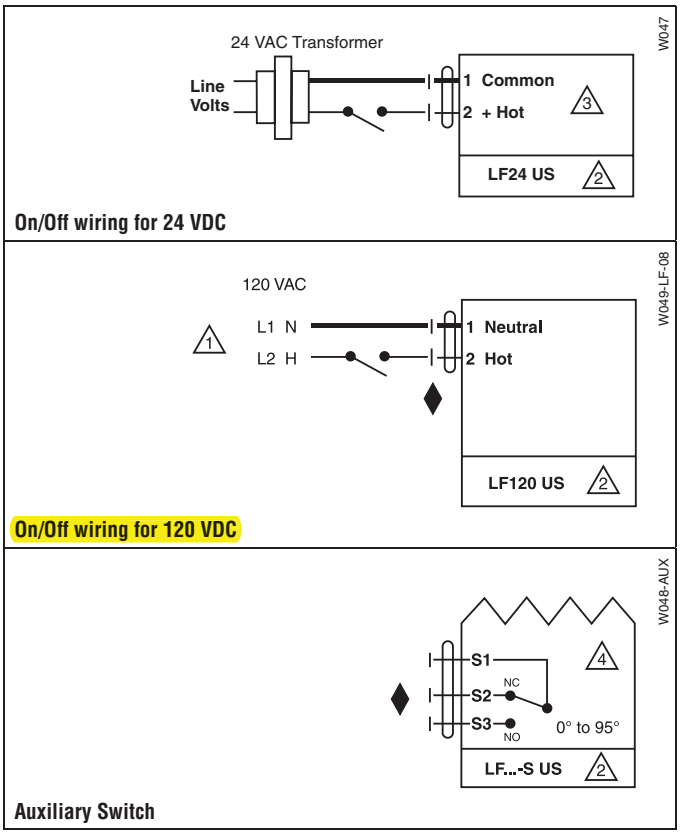
3 Actuator may also be powered by 24 VDC.

4 For end position indication, interlock control, fan startup, etc., LF24-S US and LF120-S US incorporates a built-in auxiliary switch: 1 x SPDT, 6A (1.5A) @ 250 VAC, UL listed, adjustable 0° to 95°.

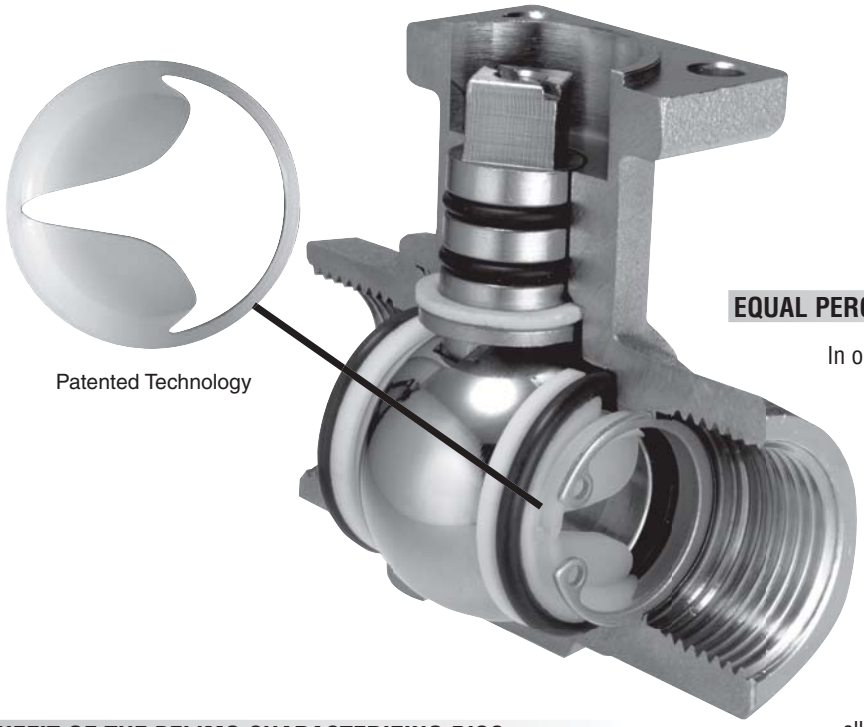
APPLICATION NOTES

♦ Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

***WARNING** Live Electrical Components!*
During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



Features and Benefits



EQUAL PERCENTAGE VALVE CHARACTERISTIC

In order to ensure good stability of control, it is essential for a control valve to have an equal percentage characteristic. This type of characteristic produces a linear variation in thermal output according to the amount of opening of the valve (also known as the system characteristic). Under normal testing conditions a conventional ball valve exhibits an S-shaped characteristic. When it is installed in a real system, however, this characteristic is seriously deformed because, compared with its nominal size, a ball valve possesses an extremely high flow coefficient. Whether used with or without pipe reducers or a reduced bore, they do not normally allow stable regulation of the thermal capacity.

Belimo's unique Characterized Control Valve™ (CCV) is very different. A special characterizing disc inside the valve gives it an equal percentage characteristic which is comparable with that of a globe valve of the same nominal size. The flow (the C_V value) is reduced to the required value by a combination of the hole in the ball and the shaped aperture in the disc. The increase in flow as the valve is opened is very slow and controlled.

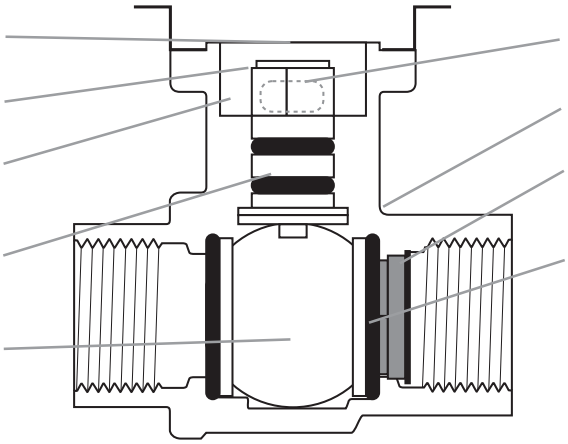
This produces better part-load behavior and improved stability of control while also optimizing energy consumption.

BENEFIT OF THE BELIMO CHARACTERIZING DISC

- Equal percentage flow characteristic.
- Excellent control stability assured with the characterizing disc.
- C_V values equal to C_V values of globe valves the same size.
- The need for multiple pipe reduction is usually eliminated.
- Better control prevents "hunting" of the control loop, increasing life span of actuator and valve.

FEATURES

- Thermal isolating adapter between flange and actuator.
- Easy direct coupling of actuator with a single screw.
- Perpendicular mounting flange and square drive head eliminate lateral forces on the stem.
- Blow-out proof stem with thrust-bearing Teflon® disc and double O-ring design for long service life.*
- Non-corroding chrome-plated brass or stainless ball.



- Vent holes reduce condensation build-up.
- Forged brass valve body — no pin-hole leaks.
- Characterizing disc — made of Tefzel® known for excellent strength and chemical resistance.
- Teflon® seats with O-rings provide constant seating force against the ball and reduce torque requirement.
- Actuator can be mounted in four different positions.

* Designed for service life of over 100,000 full cycles.
Teflon® and Tefzel® are both registered trademarks of Dupont.

2-Way Valve Flow Rate for Water Applications (Gallons Per Minute, GPM)

C_v Maximum Rating	Inches	DN mm	2-Way CCV	Pressure Drop Across the Valve									
				1 psi	2 psi	3 psi	4 psi	5 psi	6 psi	7 psi	8 psi	9 psi	10 psi
0.3	½"	15	B207(B)	0.3	0.4	0.5	0.6	0.7	0.7	0.8	0.8	0.9	0.9
0.46	½"	15	B208(B)	0.5	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5
0.8	½"	15	B209(B)	0.8	1.1	1.4	1.6	1.8	2.0	2.1	2.3	2.4	2.5
1.2	½"	15	B210(B)	1.2	1.7	2.1	2.4	2.8	2.9	3.2	3.4	3.6	3.8
1.9	½"	15	B211(B)	1.9	2.7	3.3	3.8	4.2	4.7	5.0	5.4	5.7	6.0
3	½"	15	B212(B)	3.0	4.2	5.2	6.0	6.8	7.3	7.9	8.5	9.0	9.5
4.7	½"	15	B213(B)	4.7	6.6	8.1	9.4	11	12	12	13	14	15
7.4	½"	15	B214(B)	7.4	10	13	15	17	18	20	21	22	23
10	½"	15	B215(B)*	10	14	17	20	22	24	26	28	30	32
14	½"	15	B216(B)*	14	20	24	28	31	34	37	40	42	44
4.7	¾"	20	B217(B)	4.7	6.6	8.1	9.4	11	12	12	13	14	15
7.4	¾"	20	B218(B)	7.4	10	13	15	17	18	20	21	22	23
10	¾"	20	B219(B)	10	14	17	20	22	24	26	28	30	32
14	¾"	20	B220(B)*	14	20	24	28	31	34	37	40	42	44
24	¾"	20	B221(B)*	24	34	42	48	54	59	63	68	72	76
7.4	1"	25	B222	7.4	10	13	15	17	18	20	21	22	23
10	1"	25	B223	10	14	17	20	22	24	26	28	30	32
19	1"	25	B224	19	27	33	38	42	47	50	54	57	60
30	1"	25	B225*	30	42	52	60	67	73	79	85	90	95
10	1¼"	32	B229	10	14	17	20	22	24	26	28	30	32
19	1¼"	32	B230*	19	27	33	38	42	47	50	54	57	60
25	1¼"	32	B231	25	35	43	50	56	61	66	71	75	79
37	1¼"	32	B232*	37	52	64	74	83	91	98	105	111	117
19	1½""	40	B238	19	27	33	38	42	47	50	54	57	60
29	1½"	40	B239	29	41	50	58	65	71	77	82	87	92
37	1½"	40	B240*	37	52	64	74	83	91	98	105	111	117
29	2"	50	B248	29	41	50	58	65	71	77	82	87	92
46	2"	50	B249	46	65	80	92	103	113	122	130	138	145
57	2"	50	B250*	57	81	99	114	127	140	151	161	171	180
65	2"	50	B251	65	92	113	130	145	159	170	194	195	206
85	2"	50	B252	85	120	147	170	190	208	225	240	255	269
120	2"	50	B253	120	170	208	240	268	294	318	339	360	380
240	2"	50	B254*	240	339	416	480	537	588	635	679	720	759
60	2½"	65	B261	60	85	104	120	134	147	159	170	180	190
75	2½"	65	B262	75	106	130	150	168	194	198	212	225	237
110	2½"	65	B263	110	156	191	220	246	269	291	311	330	348
150	2½"	65	B264	150	212	260	300	335	367	397	424	450	474
210	2½"	65	B265*	210	297	364	420	470	514	556	594	630	664
70	3"	80	B277	70	99	121	140	157	172	185	198	210	221
130	3"	80	B278	130	194	225	260	290	318	344	368	390	411
170	3"	80	B280*	170	240	294	340	380	416	450	481	510	538
70	2½"	65	B6250S-070	70	99	121	140	157	171	185	198	210	221
110	2½"	65	B6250S-110	110	156	191	220	244	266	282	296	312	320
110	3"	80	B6300S-110	110	156	191	220	244	266	282	296	312	320
186	4"	100	B6400S-186	186	263	322	372	416	456	492	526	558	588
290	5"	125	B6500S-290	290	410	502	580	648	710	767	820	870	917
400	6"	150	B6600S-400	400	566	693	800	894	980	1058	1131	1200	1265

$GPM = C_v \times \sqrt{\Delta p}$

*Models with no characterizing disc.

The influence of the pipe geometry due to reduced flow is negligible for all valves 57 C_v and below with characterizing discs.