

Mark 978LF Series

Sanitary Low Flow Control Valves

The Mark 978LF Sanitary Low Flow Control Valve is designed to meet the stringent specifications for low flow sterile processes. Steriflow's strict adherence to ASME BPE, and sanitary regulations make these low flow control valves suitable for a wide variety of liquid and gaseous media. The Mark 978LF is ideal for use in Clean air or gas, USP Purified Water, and CIP service in pharmaceutical and bioprocess, and in a variety of applications in the cosmetic, dairy, and food & beverage industries.

Whether the need is to control pressure, temperature, flow pH, level, or other variables, the MK978LF's true characterized trims and excellent repeatability makes it the right choice for your sanitary process applications.

FEATURES

- Maintenance-friendly – easy to perform maintenance with simple disassembly, reassembly and steam-in-place/clean-in-place capabilities
- Wetted parts made of 100% 316L Stainless Steel barstock
- No guiding surfaces in the fluid – prevents particulate generation
- Epoxy coated multi-spring actuators provide excellent corrosion resistance during washdown
- Self-draining – when mounted in vertical or horizontal orientations
- No threads in contact with service media – prevents accumulation of contaminants
- Mechanically polished internal components – 20 Ra (0,5 µm) finish, electropolish – standard, 8 Ra optional
- FDA and USP Class VI conformity on all process seal materials

DOCUMENTATION

The following documentation is kept in an electronic data base, and included with each order at no charge:

- Steriflow Unicert - Certificate of Compliance for:
 - Material, including MTR's
 - Surface Finish
 - FDA/USP Class VI

Each Unicert document lists the orders individual valve Serial/Suffix numbers and wetted component Heat numbers. MTR's for each Heat number follow on attached pages. The Serial numbers and Heat numbers are directly traceable to each individual valve.



New, optional Remote mount positioner!

AVAILABLE FINISHES

Body

- *Standard:* 20 Ra mechanical finish on internal wetted surfaces (0,5 µm); machine finish on exterior (63 RMS), and electropolished inside and out
- *Optional:* 20 Ra mechanical finish on external surfaces (0,5 µm); 8 Ra finish on internal or external surfaces (0,2 µm)

Stem

- *Standard:* 20 Ra mechanical finish and electropolish (0,5 µm)
- *Optional:* 8 Ra mechanical finish (0,2 µm)

APPLICATIONS

A wide variety of applications exist for the MK978LF in the pharmaceutical, biotech, cosmetic, and food and beverage industries.

- Clean air or gas, USP Purified Water, and CIP service
- Liquid ingredient addition

SPECIFICATIONS

Sizes: 1/2" (DN15) & 3/4" (DN20)
Material: 316L Barstock body and trim
End Connections: ASME Tri-Clamp, tube weld ends, for others, consult factory
Cv (Kv) - Linear or Equal Percentage:
 0.10 (0,086)
 0.08 (0,069)
 0.05 (0,043)
Cv (Kv) - Linear*:
 0.02 (0,017)
 0.01 (0,008)
 0.005 (0,004)

*Equal Percentage action can be configured through the positioner settings

Body/Bonnet Seal: Teflon® gasket (FDA/USP Class VI)

Shutoff: ANSI Class III

Actuator: 14M multispring actuator, aluminum (standard) or SST (optional)

O-Ring Material: EPDM, Viton, Flouraz, Silicone, Kalrez (all FDA/USP Class VI)

Stem Seal

- FDA/USP Class VI EPDM – to 275°F (+135°C)
- FDA/USP Class VI Silicon – to +450°F (+232°C)*
- FDA/USP Class VI Viton® – to +400°F (+204°C)*
- FDA/USP Class VI Kalrez® – to +450°F (+232°C)
- FDA/USP Class VI Fluoraz® – to +450°F (+232°C)

*While rated to exceed normal Clean Steam operating temperatures, Steriflow does not recommend the use of non-encapsulated Viton, or Silicon for continuous clean steam service. Contact the factory if questions.

Maximum Pressure @ 100°F (37,8°C): 450 psi (31,0 bar)

Pressure @ Maximum Temperature: 200 psi @ 300°F

(13,8 bar @ 149°C) depending on o-ring selection

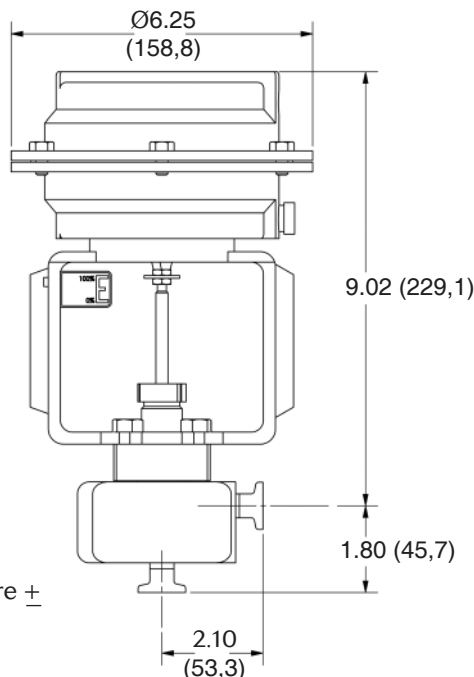
Weight:

- 8.2 lbs (3,7 kgs) – with Aluminum 14M actuator
- 10.2 lbs (4,6 kgs) – with Stainless Steel 14M actuator

Cv vs TRAVEL

Cv	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
0.10 EQ	0.011	0.014	0.018	0.022	0.025	0.029	0.032	0.058	0.083	0.106
0.08 EQ	0.010	0.012	0.015	0.018	0.020	0.023	0.025	0.046	0.066	0.085
0.05 EQ	0.009	0.011	0.014	0.018	0.020	0.022	0.024	0.028	0.045	0.061
0.10 LN	0.018	0.028	0.038	0.048	0.058	0.068	0.078	0.088	0.098	0.107
0.08 LN	0.015	0.023	0.031	0.039	0.046	0.054	0.062	0.069	0.077	0.084
0.05 LN	0.023	0.026	0.028	0.031	0.033	0.035	0.038	0.041	0.045	0.049
0.02 LN	0.0050	0.0066	0.0082	0.0097	0.0113	0.0128	0.0144	0.0159	0.0175	0.0190
0.01 LN	0.0018	0.0026	0.0034	0.0042	0.0050	0.0058	0.0066	0.0074	0.0082	0.0090
0.005 LN	0.0007	0.0013	0.0018	0.0023	0.0028	0.0033	0.0038	0.0044	0.0050	0.0055

DIMENSIONS

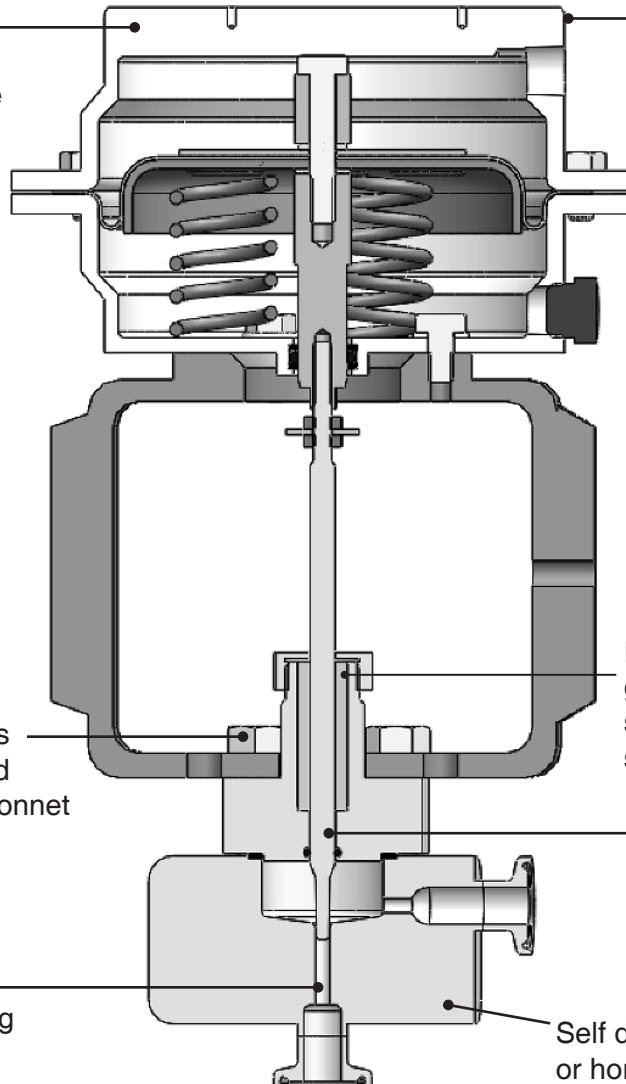


Tolerance: FE, Tri-Clamp & Tube End F-F Dim are ± 1/16" all other dimensions: ± 1/2"

FEATURES & BENEFITS

Rugged 14M actuator has been field-proven for smooth operation over the life of the valve

Corrosion resistant coating with SST fasteners. SST actuator optional



Bolted bonnet provides enhanced strength and safety over clamped bonnet

Extended FDA/USP Class VI PEEK guide bushing ensures smooth, stable movement throughout entire stroke length

316L SST solid barstock stem/plug

Broad selection of FDA/USP Class VI o-ring materials

Self draining in either vertical (shown) or horizontal orientation

ORDERING SCHEMATIC

1	—	2	—	3	/	4	5	6	7	8	9
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1	Model
978	Standard
978MV	Motor Valve
978SP	Side Mounted Positioner
978TP	Top Mounted Positioner

2	Size
050	1/2"
075	3/4"

3	Low Flow
LF	Low Flow

MARK 978LF SANITARY LOW FLOW CONTROL VALVES

4	1/2" Tri-C Body, Cv, Char. Finish
AALN6A	1/2" LIN Cv 0.05 20Ra int./63RMS ext.
A1LN6A	1/2" LIN Cv 0.05 20Ra int./20Ra ext.
A2LN61	1/2" LIN Cv 0.05 8Ra int./20Ra ext.
A3LN61	1/2" LIN Cv 0.05 8Ra int./8Ra ext.
A4LN61	1/2" LIN Cv 0.05 8Ra int./63 RMS ext.
AAEPA6	1/2" EQP Cv 0.05 20Ra int./63 RMS ext.
A1EPA6	1/2" EQP Cv 0.05 20Ra int./20Ra ext.
A2EP16	1/2" EQP Cv 0.05 8Ra int./20Ra ext.
A3EP16	1/2" EQP Cv 0.05 8Ra int./8Ra ext.
A4EP16	1/2" EQP Cv 0.05 8Ra int./63 RMS ext.
AALN7A	1/2" LIN Cv 0.08 20Ra int./63 RMS ext.
A1LN7A	1/2" LIN Cv 0.08 20Ra int./20Ra ext.
A2LN71	1/2" LIN Cv 0.08 8Ra int./20Ra ext.
A3LN71	1/2" LIN Cv 0.08 8Ra int./8Ra ext.
A4LN71	1/2" LIN CV 0.08 8Ra int./63 RMS ext.
AAEPA7	1/2" EQP Cv 0.08 20Ra int./63RMS ext.
A1EPA7	1/2" EQP Cv 0.08 20Ra int./20RA ext.
A2EP17	1/2" EQP Cv 0.08 8Ra int./20RA ext.
A3EP17	1/2" EQP Cv 0.08 8Ra int./8RA ext.
A4EP17	1/2" EQP Cv 0.08 8Ra int./63RMS ext.
AALN8A	1/2" LIN Cv 0.1 20Ra int./63 RMS ext.
A1LN8A	1/2" LIN Cv 0.1 20Ra int./20Ra ext.
A2LN81	1/2" LIN Cv 0.1 8Ra int./20Ra ext.
A3LN81	1/2" LIN Cv 0.1 8Ra int./8Ra ext.
A4LN81	1/2" LIN CV 0.1 8Ra int./63 RMS ext.
AAEPA8	1/2" EQP Cv 0.1 20Ra int./63RMS ext.
A1EPA8	1/2" EQP Cv 0.1 20Ra int./20RA ext.
A2EP18	1/2" EQP Cv 0.1 8Ra int./20RA ext.
A3EP18	1/2" EQP Cv 0.1 8Ra int./8RA ext.
A4EP18	1/2" EQP Cv 0.1 8Ra int./63RMS ext.
CALN3A	1/2" LIN Cv 0.005 20RA INT. /63 RMS EXT.
C1LN3A	1/2" LIN Cv 0.005 20RA INT. /20 RA EXT.
C2LN31	1/2" LIN Cv 0.005 8RA INT. /20 RA EXT.
C3LN31	1/2" LIN Cv 0.005 8RA INT. /8RA EXT.
C4LN31	1/2" LIN Cv 0.005 8RA INT. /63 RMS EXT.
CALN4A	1/2" LIN Cv 0.01 20RA INT. /63 RMS EXT.
C1LN4A	1/2" LIN Cv 0.01 20RA INT. /20 RA EXT.
C2LN41	1/2" LIN Cv 0.01 8RA INT. /20 RA EXT.
C3LN41	1/2" LIN Cv 0.01 8RA INT. /8RA EXT.
C4LN41	1/2" LIN Cv 0.01 8RA INT. /63 RMS EXT.
CALN5A	1/2" LIN Cv 0.02 20RA INT. /63 RMS EXT.
C1LN5A	1/2" LIN Cv 0.02 20RA INT. /20 RA EXT.
C2LN51	1/2" LIN Cv 0.02 8RA INT. /20 RA EXT.
C3LN51	1/2" LIN Cv 0.02 8RA INT. /8RA EXT.
C4LN51	1/2" LIN Cv 0.02 8RA INT. /63 RMS EXT.

4	3/4" Tri-C Body, Cv, Char. Finish
BALN6A	3/4" LIN Cv 0.05 20Ra int./63RMS ext.
B1LN6A	3/4" LIN Cv 0.05 20Ra int./20Ra ext.
B2LN61	3/4" LIN Cv 0.05 8Ra int./20Ra ext.
B3LN61	3/4" LIN Cv 0.05 8Ra int./8Ra ext.
B4LN61	3/4" LIN Cv 0.05 8Ra int./63 RMS ext.
BAEPA6	3/4" EQP Cv 0.05 20Ra int./63 RMS ext.
B1EPA6	3/4" EQP Cv 0.05 20Ra int./20Ra ext.
B2EP16	3/4" EQP Cv 0.05 8Ra int./20Ra ext.
B3EP16	3/4" EQP Cv 0.05 8Ra int./8Ra ext.
B4EP16	3/4" EQP Cv 0.05 8Ra int./63 RMS ext.
BALN7A	3/4" LIN Cv 0.08 20Ra int./63 RMS ext.
B1LN7A	3/4" LIN Cv 0.08 20Ra int./20Ra ext.
B2LN71	3/4" LIN Cv 0.08 8Ra int./20Ra ext.
B3LN71	3/4" LIN Cv 0.08 8Ra int./8Ra ext.
B4LN71	3/4" LIN CV 0.08 8Ra int./63 RMS ext.
BAEPA7	3/4" EQP Cv 0.08 20Ra int./63RMS ext.
B1EPA7	3/4" EQP Cv 0.08 20Ra int./20RA ext.
B2EP17	3/4" EQP Cv 0.08 8Ra int./20RA ext.
B3EP17	3/4" EQP Cv 0.08 8Ra int./8RA ext.
B4EP17	3/4" EQP Cv 0.08 8Ra int./63RMS ext.
BALN8A	3/4" LIN Cv 0.1 20Ra int./63 RMS ext.
B1LN8A	3/4" LIN Cv 0.1 20Ra int./20Ra ext.
B2LN81	3/4" LIN Cv 0.1 8Ra int./20Ra ext.
B3LN81	3/4" LIN Cv 0.1 8Ra int./8Ra ext.
B4LN81	3/4" LIN CV 0.1 8Ra int./63 RMS ext.
BAEPA8	3/4" EQP Cv 0.1 20Ra int./63RMS ext.
B1EPA8	3/4" EQP Cv 0.1 20Ra int./20RA ext.
B2EP18	3/4" EQP Cv 0.1 8Ra int./20RA ext.
B3EP18	3/4" EQP Cv 0.1 8Ra int./8RA ext.
B4EP18	3/4" EQP Cv 0.1 8Ra int./63RMS ext.
FALN3A	3/4" LIN CV 0.005 20Ra int./63 RMS ext.
F1LN3A	3/4" LIN CV 0.005 20Ra int./20 RA ext.
F2LN31	3/4" LIN CV 0.005 8Ra int./20 RA ext.
F3LN31	3/4" LIN CV 0.005 8Ra int./8 RA ext.
F4LN31	3/4" LIN CV 0.005 8Ra int./63 RMS ext.
FALN4A	3/4" LIN CV 0.01 20Ra int./63 RMS ext.
F1LN4A	3/4" LIN CV 0.01 20Ra int./20 RA ext.
F2LN41	3/4" LIN CV 0.01 8Ra int./20 RA ext.
F3LN41	3/4" LIN CV 0.01 8Ra int./8 RA ext.
F4LN41	3/4" LIN CV 0.01 8Ra int./63 RMS ext.
FALN5A	3/4" LIN CV 0.02 20Ra int./63 RMS ext.
F1LN5A	3/4" LIN CV 0.02 20Ra int./20 RA ext.
F2LN51	3/4" LIN CV 0.02 8Ra int./20 RA ext.
F3LN51	3/4" LIN CV 0.02 8Ra int./8 RA ext.
F4LN51	3/4" LIN CV 0.02 8Ra int./63 RMS ext.

continued

MARK 978LF SANITARY LOW FLOW CONTROL VALVES

5	Stem Seal
EP	EPDM / FDA/ USP CL6
FZ	Fluoraz / FDA/ USP CL6
KZ	Kalrez / FDA / USP CL6
SI	Silicone / FDA/ USP CL6
VI	Viton / FDA / USP CL6
ZZ	Non-Standard

6	Actuator/Range
	978 / 978TP
D1	14M Aluminum / 3-15 / Direct
R1	14M Aluminum / 3-15 / Reverse
D2	14M Aluminum / 6-30 / Direct
R2	14M Aluminum / 6-30 / Reverse
D3	14M SST / 3-15 / Direct
R3	14M SST / 3-15 / Reverse
D4	14M SST / 6-30 / Direct
R4	14M SST / 6-30 / Reverse
	978SP
D1	14M Aluminum / All / Direct
R1	14M Aluminum / All / Reverse
D3	14M SST / All / Direct
R3	14M SST / All / Reverse
	978MV
1D	MV1010 / 4-20MA Direct / All
1R	MV1010 / 4-20MA Reverse / All
ZZ	Non-Standard

7	Action
DD	Direct
RR	Reverse
ZZ	Non-Standard

8	Accessories
00	None
1A	I/P Trans. 4-20MA / 3-15P
2A	Air regulator with gage
3A	I/P Trans. 4-20MA / 6-30P
ZZ	Non-Standard

9	Positioners
N	None
A	SMP Dir / Rev 3-15
B	SMP Dir / Rev 3-9
C	SMP Dir / Rev 9-15
D	SMP/IP Dir / Rev 4-20
E	SMP/IP Dir / Rev 4-12
F	SMP/IP Dir / Rev 12-20
G	MK 16IQ-S
H	MK 16IQ-B Dir / Rev
J	MK 16IQ-FF Dir / Rev
Z	Non-Standard



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