

LEVIFLOW® Single Use Flow Meters & PendoTECH® LEVIFLOW Sensor Monitor



INTRODUCTION

The LEVIFLOW® single-use flow meters are for ultrasonic flow measurements in many different applications in the Biopharm Industry. Figure 1 illustrates the operating principle. Two piezoelectric transducers, mounted in the sensor housing, generate and receive an ultrasonic wave. The wave going in direction of the flow (with-stream wave) is accelerated and the wave going against the flow direction (against-stream wave) is slowed down. The two waves are processed by the PendoTECH Leviflow® Sensor Monitor. The difference of the transit time of both waves is proportional to the velocity of the fluid. The monitor has a digital LED display for the flow reading. It also has both a 4-20mA analog output and a digital frequency output. These outputs facilitate interface of the monitor to other systems for process control and data acquisition.

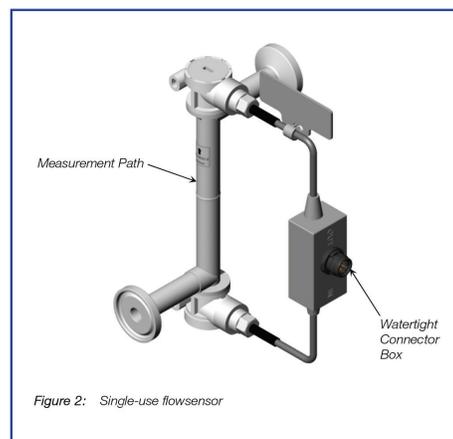
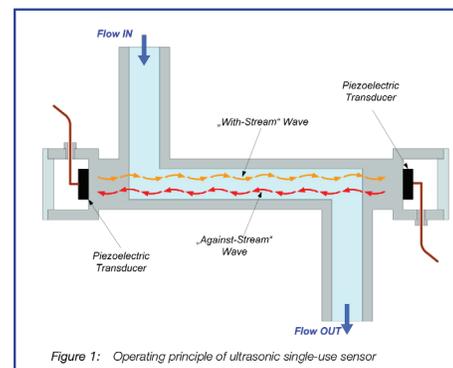
The standard configuration of the LEVIFLOW single-use flow meters (Figure 2) consists of a flow sensor and the PendoTECH LEVIFLOW Sensor Monitor with a digital signal processor (DSP) for processing the sensor signals.

SYSTEM BENEFITS

- High precision ($\approx 1\%$ of reading) flow measurement
- Flow sensor can be used as single use to prevent cross-contamination or re-used
- No moving parts -> no particle generation
- Improved bubble robustness due to DSP technology
- Easy integration into OEM equipment
- The wet materials of the single-use sensors fabricated from biocompatible (FDA, USP-VI, BSE/TSE and Animal free) gamma sterilizable polypropylene (PP).

APPLICATIONS

- TFF filtrate flow
- Normal flow/depth filtration
- Chromatography

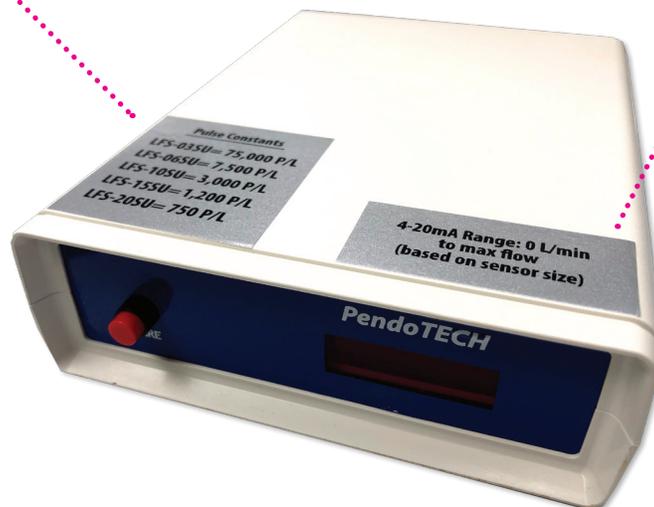


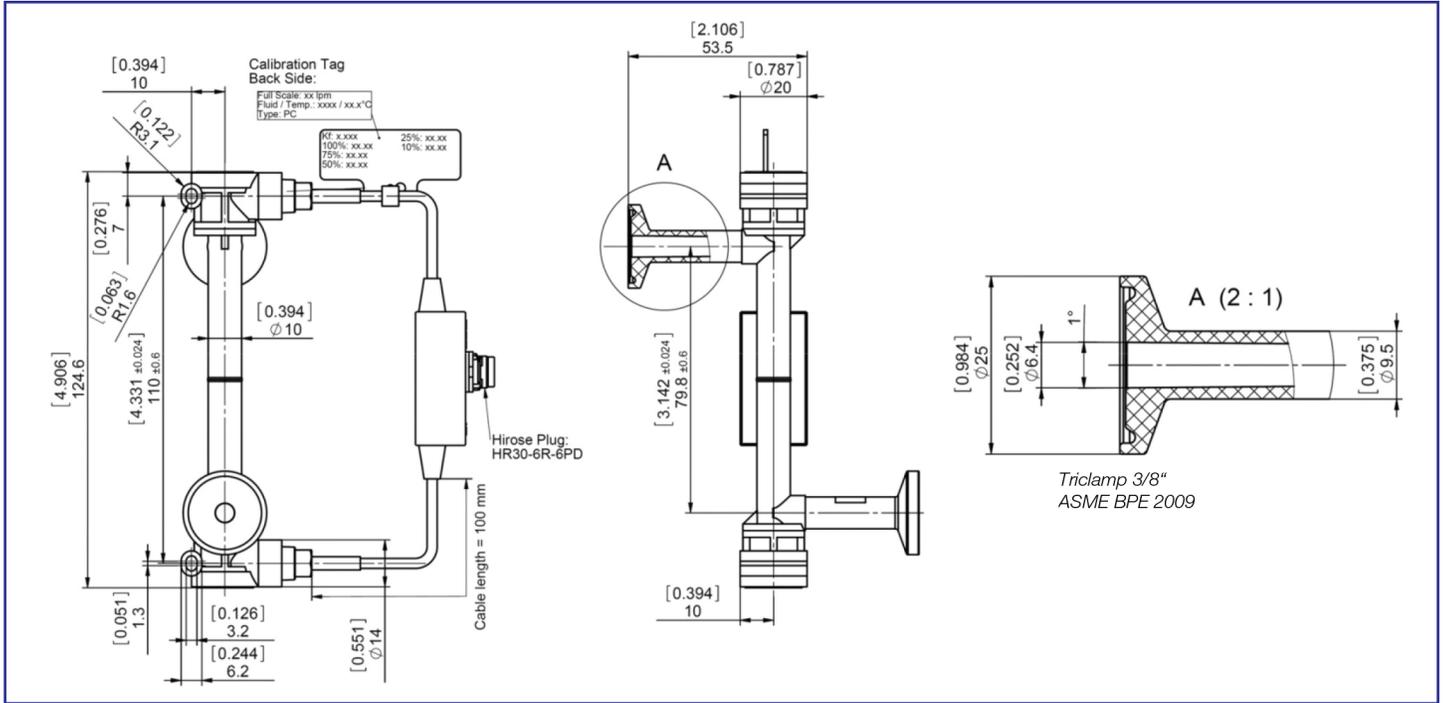
Sensor Specifications:

Sensor Type/Characteristics	FM-LFS-03SU	FM-LFS-06SU	FM-LFS-10SU	FM-LFS-15SU	FM-LFS-20SU
Flow Range [lpm]	0 – 0.8	0 – 8	0 – 20	0 – 50	0 – 80
Triclamp Fitting Size	3/8inch (ID = 6.4mm)	3/8inch (ID = 6.4mm)	1/2inch (ID = 9.4mm)	1inch (ID = 22.2mm)	1inch (ID = 22.2mm)
Measurement Path ID in [mm]	2.5	6	10		20
Accuracy of Reading Note: Repeatability < Accuracy/2	> 6ml/min: ±1% < 6ml/min: ±0.06ml/min	> 1.7l/min: ±1% < 1.7l/min: ±17ml/min	> 4.7l/min: ±1% < 4.7l/min: ±47ml/min	> 10.6l/min: ±1% < 10.6l/min: ±106ml/min	>18.8l/min: ±1 % <18.8l/min: ±188ml/min
Wetted Surface Area [cm ²]	29.5	32.2	53.2	141.2	173.5
Wetted Surface Area [ml]	4	4.8	12.3	61.7	95.8
Weight [g]	42	43	61	96	125
Pressure Drop Coefficient C at 20°C $\Delta P = C \times Q^2$, Q = Flow [lpm], ΔP = Press. Drop [kPa]	16.8	0.88	0.075	0.0101	0.0035
Fluid Temperature	Normal range: 10 – 60°C (50 – 140°F)				
Ambient Temperature	0 – 40°C (32 – 104°F)				
Maximum Fluid Pressure	0 – 0.5MPa (0 – 5bar, 0 – 72.5psi)				
Kinematic Viscosity	0.8 – 40mm ² /s (0.8 – 40cSt)				
Sound Speed	1000 – 2200m/s				
Wet Materials	Polypropylene (FDA, USP VI, ADI free), Gamma robust for up to 40kGy				
Sensor Enclosure Classification	IP-65 (for connected sensor)				
Cable Jacket Material	PVC				
Cable Length (re-usable cable)	9ft/3 meter				
Electrical Connectors	Circular type (IP-67), lock-release mounting				

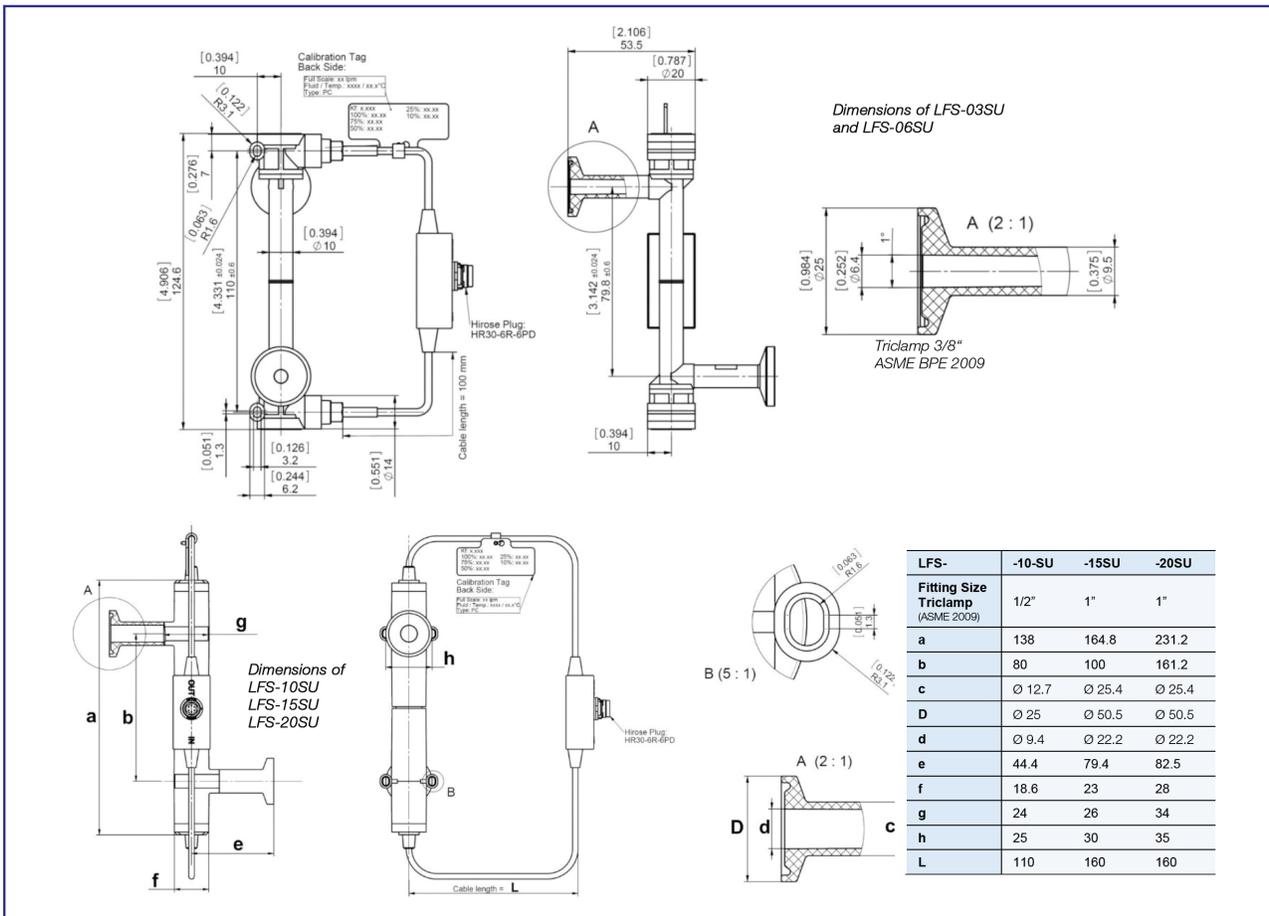
Pulse Constants
LFS-03SU = 75,000 P/L
LFS-06SU = 7,500 P/L
LFS-10SU = 3,000 P/L
LFS-15SU = 1,200 P/L
LFS-20SU = 750 P/L

4-20mA Range: 0L/min to max flow
(based on sensor size)



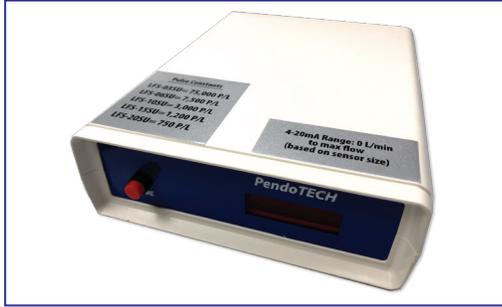


Dimensions in mm(inches) for FM-LFS-03SU and FM-LFS-06SU flow sensors

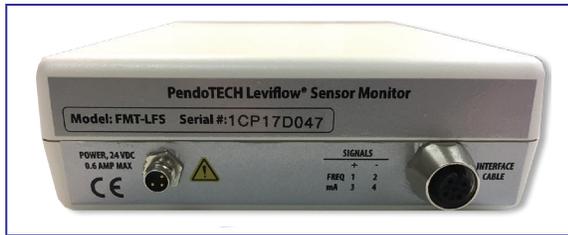


Dimensions for FM-LFS-10SU, FM-LFS-15SU & FM-LFS-20SU flow sensors

Specifications



FMT-LFS PendoTECH Leviflow Sensor Monitor



FMT-LFS PendoTECH Leviflow Sensor Monitor
(back view)



Flow sensor stand included with monitor

PendoTECH Leviflow® Monitor Specifications

Characteristics	Descriptions or Values
Power Supply	24VDC +/- 10%
Current/Inrush (Start-Up) Current	150mA / Peak of 3.8A within 210µs
Ambient Temp	0-40°C (32-104°F)
Humidity Range	30-85% R.H. (no condensation)
Interfaces	Analog Milliamp: Analog Output 4-20mA (20 mA set to max flow automatically) Digital as Frequency (max flow set to 1KHZ)
Weight	485g
Dimensions (W x L x H) cm	13.65 x 19.05 x 4.45

Ordering Information

FM-LFS-03SU	Leviflow single use flow sensor to 0.8LPM
FM-LFS-06SU	Leviflow single use flow sensor to 8LPM
FM-LFS-10SU	Leviflow single use flow sensor to 20LPM
FM-LFS-15SU	Leviflow single use flow sensor to 50LPM
FM-LFS-20SU	Leviflow single use flow sensor to 80LPM
FM-LFI-C-1-30	LeviFlow Sensor Interconnect Cable, 3m, PVC
FM-LFI-C-1-60	LeviFlow Sensor Interconnect Cable, 6m, PVC
FMT-LFS	PendoTECH Leviflow Sensor Monitor with display (includes power supply, Leviflow interconnect cable, stand; also includes interface cable or connector of choice)
PDKT-US-PMATA	Single Use and Low Flow Ultrasonic flowmeter to PressureMAT analog input, 6ft
MC-6897K35	Micro connector with integral cable with flying leads
FM-LF-CONVERT	Levitronix single channel DIN rail transmitter
FM-LF-EXT-1M	LeviFlow Wall Mount Extension Cable, 1M
FM-LF-EXT-3M	LeviFlow Wall Mount Extension Cable, 3M
FM-LF-EXT-6M	LeviFlow Wall Mount Extension Cable, 6M
LEVI-STAND	Flow Sensor Stand



Complete setup

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