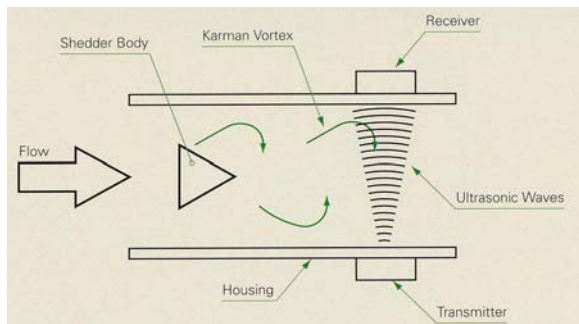


The eddysonic flowmeter is a flowmeter for fluids that detects the vortex street using the ultrasonic sensor mounted on the outside of it. Its part in contact with fluids is entirely molded with PFA to provide no movable part, allowing the measurement for the flow rates of pure water or corrosive chemical fluids.

Operating Principle



If a fluid flows past a shedder body, a regular pattern of vortices called Karman Vortex street alternately trails aft in the wake. The ultrasonic wave oscillating time varies proportional to the vortex shedding frequency. We can obtain the measured flow by detecting any changes in ultrasonic wave oscillating time.

Features

- Because PFA Flowmeters measure Karman Vortexes using a non-contact ultrasonic sensor method, they contain no moving parts such as flippers & floats, thus eliminating particle generation.
- Contact parts are constructed with PFA material, so Flowmeters can be used to measure even highly corrosive chemicals and other fluids.
- Lightweight and compact, Flowmeters can be mounted directly onto existing piping systems.
- Flowmeters allow for easy maintenance, as they contain no mechanical moving parts
- Rated output signal is 4 ~ 20 mA.
- High and low alarm boundaries can be set to any level using selector keys.

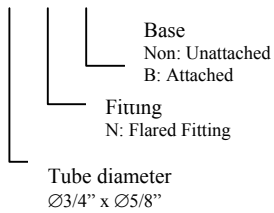


PFA EDDYSONIC FLOW METERS by **SURPASS**

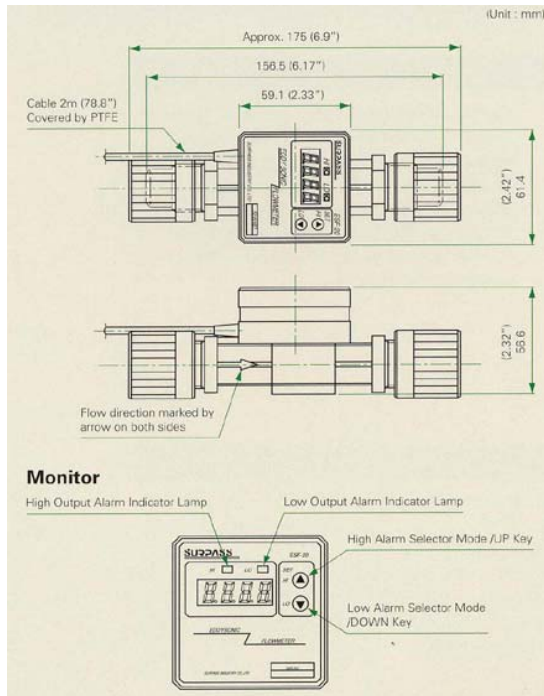


Model	ESF-20U-N □	
Applicable Media	Liquids	
Flow Meter Range (at water)	6~40 l/min (at 1x10 ⁻⁶ m ² /s)	
Measurement Accuracy	± 1.5% F.S.	
Environmental Temperature	5~60°C (41~140°F)	
Fluid Temperature	5~85°C (41~185°F)	
Fluid Pressure	Max. 600kPa (at 25°C)/ (Max. 87 psig at (77°F))	
Connector Tube Diameters	Ø3/4" x Ø5/8"	
Material in contact with fluid	PFA	
Mounting Positions	Horizontal – Vertical or Diagonal (Do not use in vertical drop position)	
Analog Output	- Output - Load Resistance	DC 4~20 mA 500 Ω or less
Pulse Output	- Output - Excitation Voltage/Current - Pulse Unit - Pulse Range	NPN Open Collector Max. DC 30 V / 80 mA 10 ml/P 5 mS
High and low boundary output	- Output - Excitation	NPN Open Collector Max. DC 30 V / 80 mA
Power Supply		DC 24V ± 10%
Current Consumption		120 mA or Less
Cable		2m (78.8")

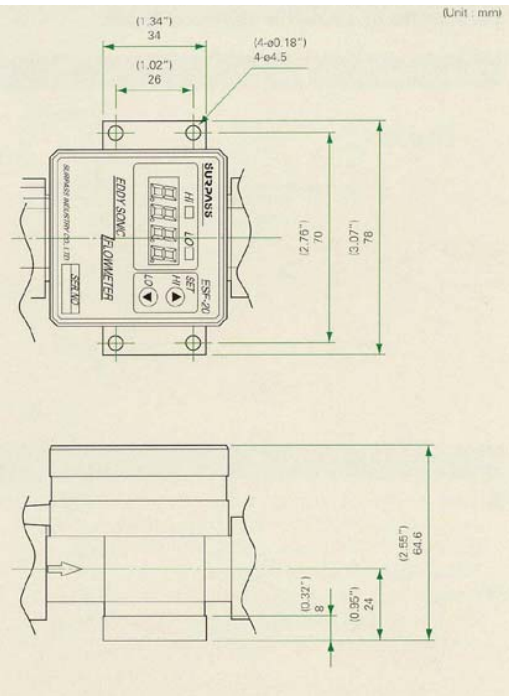
ESF-20U-N □



Dimensions



Dimensions of ESF-20U-N



NANO-MASTER, Inc. 3019 Alvin Devane Blvd. Suite 300, Austin, TX 78741
Tel. (512) 385-4552; Fax (512) 385-4900; <http://www.nanomaster.com>; main@nanomaster.com

PFA EDDYSONIC FLOW METERS by
SURPASS



Model	ESF-15U	ESF-10U
Applicable Media	Liquids	
Flow Meter Range (at water)	2.5~16 l/min (at $1 \times 10^{-6} \text{m}^2/\text{s}$)	0.7~3.5 l/min (at $1 \times 10^{-6} \text{m}^2/\text{s}$)
Measurement Accuracy	$\pm 2.5\%$ F.S.	$\pm 5\%$ F.S.
Environmental Temperature	5~60°C (41~140°F)	
Fluid Temperature	5~85°C (41~185°F)	
Fluid Pressure	Max. 800kPa (at 25°C)/ (Max. 116 psig at (77°F))	
Connector Tube Diameters	$\varnothing 1/2'' \times \varnothing 3/8''$	$\varnothing 3/8'' \times \varnothing 1/4''$
Material in contact with fluid	PFA	
Mounting Positions	Horizontal – Vertical or Diagonal (Do not use in vertical drop position)	
Analog Output	- Output - Load Resistance	DC 4~20 mA 500 Ω or less
Pulse Output	- Output - Excitation Voltage/Current - Pulse Unit - Pulse Range	NPN Open Collector Max. DC 30 V / 80 mA 10 ml/P 5 mS
High and low boundary output	- Output - Excitation Voltage/Current	NPN Open Collector Max. DC 30 V / 80 mA
Power Supply	DC 24V $\pm 10\%$	
Current Consumption	120 mA or Less	
Cable	2m (78.8'')	

ESF-15U

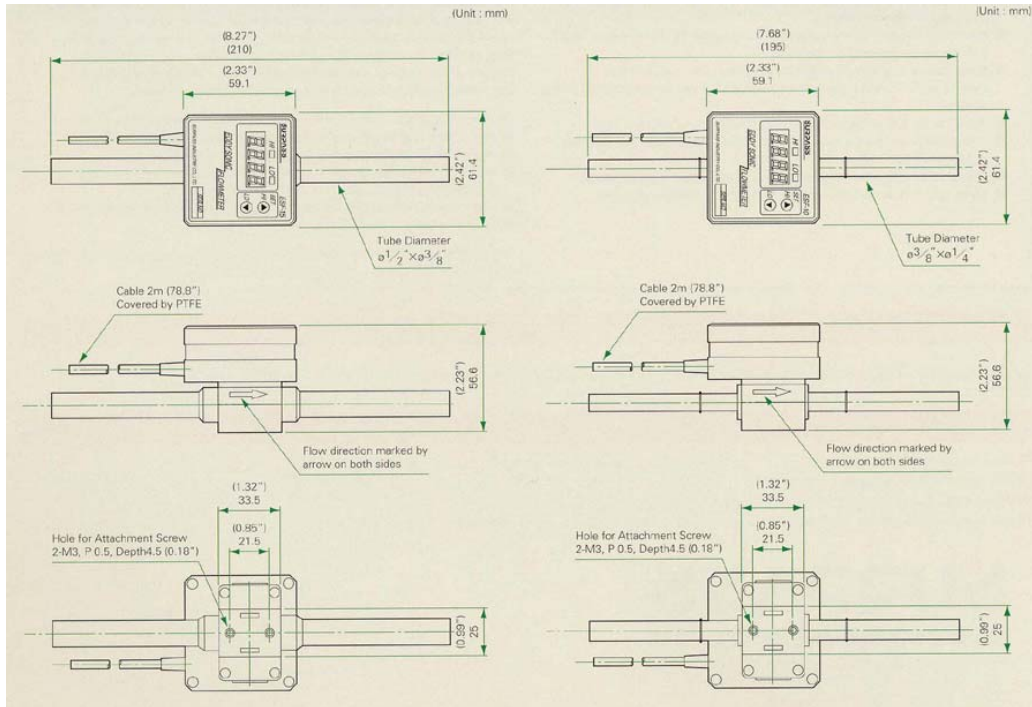
Tube Diameter
 $\varnothing 1/2'' \times \varnothing 3/8''$

ESF-10U

Tube Diameter
 $\varnothing 3/8'' \times \varnothing 1/4''$

Dimensions of ESF-15U

Dimensions of ESF-10U

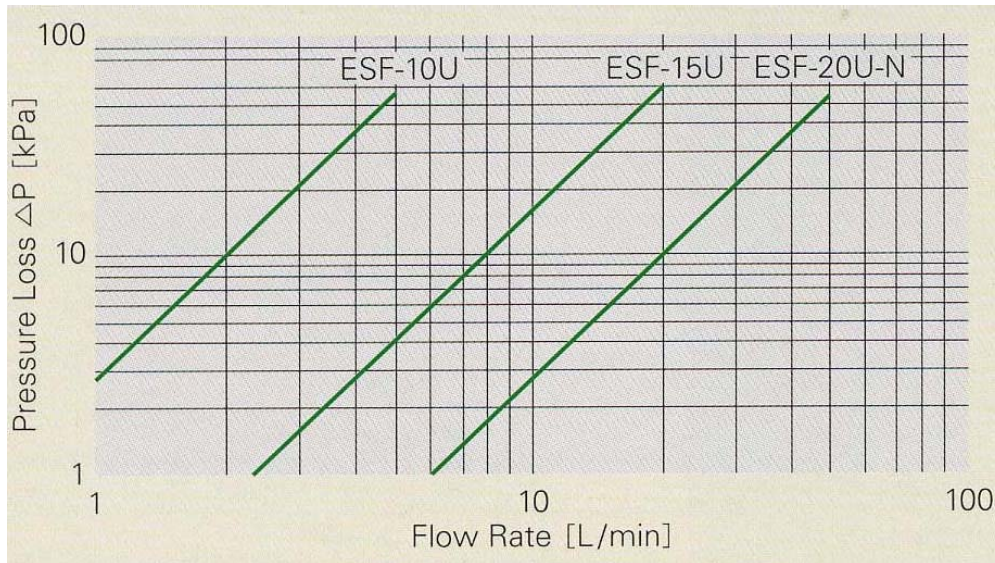


Range of Flow Rate

Kinetic viscosity of fluids [$\times 10^{-6} \text{m}^2/\text{s}$]	1	2	3	4	5	6	7	Maximum flow rate (l/min)
Minimum flow rate of ESF-20U-N□ [l/min]	6	8	12	16	20	24	28	40
Minimum flow rate of ESF-15U [l/min]	2.5	5	7.5	10	12.5	15	----	16
Minimum flow rate of ESF-10U [l/min]	0.7	1.4	2.1	2.8	----	----	----	3.5

*The minimum flow rates of the fluids, of which kinetic viscosity are more than $2[\times 10^{-6} \text{m}^2/\text{s}]$, are the theoretical values and may be different from the actual values.

Pressure Loss



Pressure at Downstream Side

To prevent the occurrence of cavitations, the pressure value at the downstream side should be more than one obtained from the following formula.

$$P_d = 2.7\Delta P = 1.3P_o$$

P_d: Pressure values at the downstream side. [kPa abs.]

ΔP: Pressure loss values [kPa]

P_o: Vapor pressure values of fluids. [kPa abs.]

