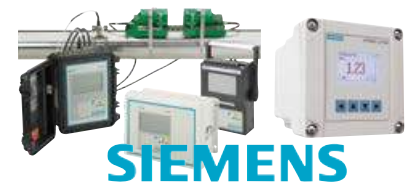


	Prices Start at	See Page
<b>Coriolis Flow</b>		
Honeywell VersaFlow Coriolis Mass Flowmeters	Call	64
Siemens SITRANS FC Coriolis Mass Flowmeters	Call	70
<b>Differential Pressure and Multivariable Mass Flow</b>		
Honeywell SMV3000 Smart Mass Flowmeter	\$2939.00	63
Pitot Tubes, Venturi Tubes, and Bluff Body Flowmeters	Call	62
Orifice Plates and Orifice Flange Unions	Call	62
<b>Electromagnetic Flow</b>		
Honeywell VersaFlow Electromagnetic Flowmeters	Call	64
Siemens SITRANS FM MAGFLO Electromagnetic Flowmeters	Call	66
<b>Mechanical Flow</b>		
GEMS Flowmeters and Switches	\$55.00	58
Kobold Flow Switches	\$87.00	56
Kobold Temperature Compensated Switches and Transmitters	\$366.00	57
RCM Direct Reading Flowmeters for Liquids, Air, or Gas	\$470.00	59
<b>Thermal Mass Flow</b>		
Thermal Instrument Company Inline and Insertion Mass Flowmeters	Call	61
<b>Turbine Flow</b>		
Turbine Flowmeters for Gas and Liquid Service	Call	60
<b>Ultrasonics for Pipes and Open Channel Flow</b>		
Siemens F US Clamp-On Ultrasonic Flowmeters	\$2005.00	72
Siemens SITRANS LUT440 Open Channel Flow Monitor	\$1896.40	76
<b>Vortex Flow</b>		
Honeywell VersaFlow Vortex Flowmeters	Call	65
<b>Reference Materials</b>		
Table of Viscosities of Common Substances		489



Level Measurement Instruments

Flow Measurement Instruments

Pressure Transmitter

Temperature Sensors and Transmitters

Wireless Sensing and Communications

Analytical Instruments and Systems

## Flowmeters, Switches and Visual Flow Indicators

### PPS Polysulfone Paddle Flow Switch



**Switch:** Hermetically sealed, magnetically actuated contact; 15VA max., 0.5A max., 250V max. capacity

**Pressure:** 145 PSI max.; 1.45 PSI max. drop

**Adjustment Accuracy:** ±20%

**Switch Repeatability:** ±3%

**Maximum Temperature:** 225° F

**Material:** NEMA 4 Polysulfone, stainless steel, ceramic magnet

**Connections:** Thread: 1" NPT; Electric: DIN 43650 plug



Pipe Bore	Cutoff mark "L" Approx.	Switch Point (GPM Water)	
		Turn-On	Turn-off
1"	0.9"	9.5	5.0
1 1/4"	1.1"	9.5	5.0
1 1/2"	1.4"	14.5	9.5
2"	2.0"	19.0	9.5
2 1/2"	2.4"	24.0	14.5
3"	2.9"	28.5	19.0

#### Model Selection Guide

Please allow 3-4 weeks for delivery.

Switch Type	Catalog Number	Price
Normally Open, SPST, 15VA Max.	PPS-3106	\$124.00
Normally Closed, SPST, 15VA Max.	PPS-3105	124.00

### BVO Series Flowmeter/Switch for Water-Like Liquids

**Accuracy:** ±12% full scale; **Repeatability:** ±2% FS

**Temperature:** -10° to 212° F

**Pressure:** 145 PSIG max.

**Flow Direction:** Vertical, up

**Switch Characteristics:** N/O switch: 240 VAC/200 VDC max., 1.5 Amp AC/1.0 Amp DC max., 50 VA, 50 W max. power, 4-8 mm float travel hysteresis. SPDT switch: 240 VAC max., 0.8 Amp AC max., 30 VA max. power, 4-8 mm float travel hysteresis.



#### Model Selection Guide

Body	Water Range	Fitting Size	Pressure Loss @ Max. Flow	Catalog Number	Price
Brass	0.1 to 1.0 GPM	1/4" NPT	0.9 PSIG	BVO-6102	\$283.00
Brass	1.0 to 5.0 GPM	1/2" NPT	1.1 PSIG	BVO-6116	283.00
304 SS	0.1 to 1.0 GPM	1/4" NPT	0.9 PSIG	BVO-6202	541.00
304 SS	1.0 to 5.0 GPM	1/2" NPT	1.1 PSIG	BVO-6216	541.00
Optional SPDT Contact				Suffix -U	0.00



### Insertion Paddle/Bellows Flow Switch for Liquids

- Position-Independent Installation
- Max. Pressure 160 PSI/450 PSI, Media Temperatures to 250° F

Kobold FPS paddle bellows flow switches are used wherever reliable control for minimum or maximum liquid flow is required. The flowing medium exerts a force on the paddle to actuate a micro switch. The instrument internals are separated from the process by the bellows, making the FPS an excellent choice for dirty media.



#### Model Selection Guide

Please allow 3-4 weeks for delivery.

De-Actuating GPM H <sub>2</sub> O	Actuating GPM H <sub>2</sub> O	Pipe Size	Catalog Number	Price	Catalog Number	Price
2.6-8.8	4.4-9.3	1"	FPS-5100 (Brass)	\$277.00	FPS-5200 (SS)	\$368.00
3.5-12.3	5.7-13.2	1.25"				
4.8-16.3	7.5-17.6	1.5"				
9.7-25.1	13.7-26.9	2"				
11.9-28.6	17.6-30.2	2.5"				
18.9-47.1	27.3-50.2	3"				
50.2-122.0	64.7-127.7	4"				
100.8-234.7	125.1-244.8	5"				
158.1-360.0	189.8-385.0	6"				
319.7-729.6	374.7-759.5	8"				



#### Looking for a compact flow switch for non-viscous liquids?

Kobold's KAL-D is a compact all-stainless calorimetric thermal flow switch for use in small spaces and 1/4" NPT fittings. It has a switching range from 0.15 to 6.6 feet per second, works in pressures to 580 PSIG, and temperatures to 176° F. KAL-D can even be used in Clean-in-Place applications with short-term temperature limits of 250° F.

**KAL-D prices start at \$357.00.**



### All Metal Paddle Flow Switch

**Flow Speed:** 12 ft/sec max., adjustable flow ranges

**Contact:** Reed switch SPST, N/O or N/C; 50VA, 50 watt, 250V, 1.5A max ratings

**Pressure:** 1450 PSI max.

**Temperature:** 230° F max.

**Materials:** Housing: NEMA 4, Glass-reinforced Polyamid; Paddle, Leaf Spring, Beam: SS; Locking Plate, Screws: Brass; O-Ring: Buna-N



#### Model Selection Guide

Please allow 3-4 weeks for delivery.

	Switch ON GPM H <sub>2</sub> O	Switch OFF GPM H <sub>2</sub> O	NPT Conn.	Catalog Number	Price
Brass paddle flow switch, 5' PVC cable	0.9 - 1.3	0.6 - 1.2	1/4"	PSR-5105	\$87.00
	1.3 - 2.1	1.0 - 2.0	1/2"	PSR-5115	87.00
	3.0 - 4.0	2.2 - 3.0	3/4"	PSR-5120	87.00
	3.2 - 5.0	2.4 - 4.5	1"	PSR-5125	99.00
	4.9 - 8.5	3.8 - 7.8	1-1/4"	PSR-5132	118.00
	9.2 - 15.0	7.9 - 14.3	1-1/2"	PSR-5140	130.00

**Call for stainless steel bodies or larger pipe sizes.**

## What's the Right Flow Technology for Your Process?

Need help figuring out which flow measurement instrumentation to use in your process? Start with the reference charts below. Find your media type to help narrow down your choices. Then, take a look at the comparative specifications in the chart at the right. Depending on your application, there may be more than one technology for you.

**Key**  
 ▲ Excellent: Recommended.  
 ◆ Fair: Works, but depends on the application.  
 ▼ Poor: Do not use.

Technology	Media Type	Clean Liquid	Dirty Liquid	Viscous Liquid	Corrosives	Slurries	Clean Gas	Dirty Gas	Steam	Cryogenics
Coriolis Flowmeter		▲	▲	▲	▲	▲	◆	◆	◆	◆
DP Mass Flowmeter		▲	▲	▲	◆	◆	▲	▲	▲	▼
DP Orifice Plate		▲	◆	◆	▲	▼	▲	▲	▲	▲
DP Pitot Tube		▲	▼	▼	◆	▲	◆	◆	▲	▲
DP Wedge		▲	▲	▲	▲	▲	▲	▲	▲	▼
DP Venturi		▲	▲	◆	◆	▼	◆	◆	▲	▼
Fluidic Oscillatory		▲	◆	▲	◆	▲	▼	▼	▲	▲
Magnetic Flowmeter		▲	▲	▲	▲	▲	▼	▼	▼	▼
Paddlewheel		▲	▼	◆	◆	▲	◆	◆	▼	▼
Positive Displacement		▲	▲	▲	◆	▼	▲	▲	▼	◆
Rotameter		▲	▼	▲	◆	▼	▲	▼	◆	▼
Thermal Dispersion		▲	◆	◆	◆	◆	▲	▲	▼	◆
Turbine Flowmeter		▲	▼	◆	◆	▼	▲	◆	▲	◆
V-Notch		▲	◆	▼	◆	◆	▼	▼	▼	▼
Vortex Flowmeter		▲	◆	◆	◆	▼	▲	◆	▲	▼
Weir		▲	◆	▼	◆	◆	▼	▼	▼	▼

**Key**  
 H High  
 M Medium  
 L Low

Technology/Spec.	Turndown Ratio	Sizes	Accuracy (%FS)	Repeatability (%)	Upstream Pipe Diam.	Permanent PSI Drop	Relative Cost
Coriolis Flowmeter	25:1	0.1-6"	0.15%	0.1%	0	L	H
DP Mass Flowmeter	40:1	—	0.1%	0.1%	—	—	H
DP Orifice Plate	4:1	>1"	1%	0.1%	10-30	H	L
DP Pitot Tube	4:1	0.5-72"	0.75%	0.1%	10	L	L
DP Venturi	10:1	0.5-72"	1%	0.1%	10	M	L
DP Wedge	10:1	0.5-30"	3%	0.5%	12	H	H
Fluidic Oscillatory	15:1	1-3"	1.5%	0.2%	10	L	H
Magnetic Flowmeter	10:1	>0.1"	0.5%	0.2%	5	L	M
Paddlewheel	3:1	0.1-1.5"	2.5%	1%	0	H	L
Positive Displacement	20:1	0.5-6"	1%	0.3%	0	H	M
Rotameter	5:1	0.2-3"	4-8%	2%	0	M	L
Thermal Dispersion	100:1	0.2-72"	0.5%	0.2%	10	L	H
Turbine Flowmeter	10:1	>0.25"	0.5%	0.1%	10-20	H	H
V-Notch	300:1	—	2-5%	2%	4H	0	L
Vortex Flowmeter	H	>1"	1%	0.2%	20-30	M	L
Weir	300:1	—	2-5%	2%	4H	0	L

Viscosity table for common substances, page 489.

## Temperature-Compensated Flow Switches and Transmitters

### KAL-K Flow Switch/Trend Indicator for Liquids and Oils

#### Features

- No moveable parts
- Minimal pressure loss
- Simple media adjustment
- Temperature compensation and switch point stability
- Unaffected by viscosity changes — even for the smallest flow velocities!
- IP65 enclosure — insensitive to dirt
- Designed for minimal pipe intrusion



#### Specifications

**Measuring Range:** Water: 0.05 to 2 m/sec.; Oils: 0.1 to 4 m/sec. approx.  
**Operating Conditions:** Pressure: 1450 PSIG max.; Temperature: -10°-185° F  
**Switching:** Adjustment: By potentiometer; Selectable output: NPN or PNP, open collector; Current: 400 mA max.; Voltage: 24 VDC max.; Status indicator: Bicolored LED  
**Power:** Supply voltage: 24 VDC ±10%; Current draw: 300 mA max.  
**Materials:** Wetted parts: 304 or 316-Ti stainless steel; Housing: NEMA 4 Nylon standard, NEMA 7 Al optional  
**Fittings:** 1/2" or 3/4" NPT or 1-1/2" Tri-Clamp®.  
**Flow Trend Indicator:** Eight red LEDs

#### Approximate Switch Point (GPM) per Pipe Diameter

Nominal ID	Water Range	Nominal ID	Water Range	Nominal ID	Water Range
1/2"	0.3 – 5.0	2"	3.1 – 55	8"	50 – 900
3/4"	0.5 – 8.9	2-1/2"	4.4 – 80	10"	78 – 1400
1"	0.8 – 14	3"	7.9 – 140	12"	110 – 2000
1-1/4"	1.1 – 20	4"	12 – 220	16"	200 – 3600
1-1/2"	2.0 – 35	6"	28 – 500	20"	310 – 5600

#### Model Selection Guide

Description	Catalog Number	Price
KAL-K Flow Switch for Liquids, 24 VDC Power		
304 SS Wetted Parts, 1/2" NPT	KAL-4215	\$366.00
316-Ti SS Wetted Parts, 1/2" NPT	KAL-4315	414.00
316-Ti SS Wetted Parts, 3/4" NPT	KAL-4320	424.00
316-Ti SS Wetted Parts, 3A Sanitary	KAL-4340-S	508.00
KAL-K Flow Switch, 110 VAC Power, SPST Dry Contact Output for Liquids		
304 SS Wetted Parts, 1/2" NPT	KAL-4215-P03R	543.00
316-Ti SS Wetted Parts, 1/2" NPT	KAL-4315-P03R	591.00
316-Ti SS Wetted Parts, 3/4" NPT	KAL-4320-P03R	601.00
Options	Fast Response (2.8-6 Sec.)	-F 0.00
	Quick Disconnect Plug (24 VDC)	-M12 93.00



# Gems Flowmeters and Switches

## RotorFlow® Flow Indicators

RFI is Gems' RotorFlow® at its most basic form — a bright orange rotor turning with fluid flow. Either port can be used for incoming flow.

**Body:** Polypropylene, brass, or 316 stainless steel

**Other wetted materials:** Orange molded Nylon rotor, ceramic rotor pin, polysulfone lens, glass-reinforced polypropylene low flow adapter



### Model Selection Guide

Port Size	Flow Ranges (GPM)		Pressure Max.	Operating Temp. °F	Catalog Number	Price
	Low*	High				
RotorFlow® RFI Flow Indicator, Polypropylene Body						
0.25"	0.1 to 1.0	0.5 to 5.0	100 PSI	180° Max.	155420	\$55.00
0.50"	1.5 to 12.0	4.0 to 20.0	100 PSI	180° Max.	155480	55.00
RotorFlow® RFI Flow Indicator, Brass Body						
0.25"	0.1 to 1.0	0.5 to 5.0	200 PSI	212° Max.	142541	145.00
0.50"	1.5 to 12.0	4.0 to 20.0	200 PSI	212° Max.	142542	145.00
0.75"	—	5.0 to 30.0	200 PSI	212° Max.	180392	145.00
RotorFlow® RFI Flow Indicator, 316 Stainless Steel Body						
9/16"	0.1 to 1.0	0.5 to 5.0	200 PSI	212° Max.	174596	185.00
0.50"	1.5 to 12.0	4.0 to 20.0	200 PSI	212° Max.	173138	185.00
0.75"	—	5.0 to 30.0	200 PSI	212° Max.	181682	215.00

## Low Cost Switches for Threaded Plastic Piping

Gems FS-500 offers low cost flow monitoring with a variety of switch actuation points and low pressure drop. All wetted parts are polypropylene or stainless steel, making this switch ideal for a wide range of chemical and temperature requirements. The materials are also NSF or FDA approved for potable water treatment applications including chlorinators, purifiers and heaters.



**Wetted Materials:** Housing, Bonnet, Shuttle, Shuttle Cap: Polypropylene

**O-Ring:** Viton® or Buna N

**Spring:** 316 Stainless Steel

**Retaining Clip:** PH 15-7 Mo Stainless Steel

**Maximum Operating Temp.:** 0° to 212° F

**Setpoint Accuracy:** ±20%

**Switch:** SPST, N.O. Pilot Duty 20VA, 120-240 VAC or VDC

**Inlet/Outlet Ports:** 3/4" Female NPT

### Model Selection Guide

FS-500 Flow Switch		
Setpoint	Catalog Number	Price
0.25	170231	\$71.00
0.5	170232	71.00
1	170233	71.00
2	175117	71.00
2.5	170234	71.00
5	170235	71.00

## General Purpose Switch for Plastic Piping

These Gems FS-400P switches have a noncorrosive, clear PVC housing for broad chemical compatibility, and are ideal for flow/no-flow detection.

**Materials:** PVC, Epoxy, and Buna-N

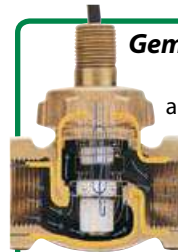
**Switch:** SPST, 20 VA, N.O. at no-flow



### Model Selection Guide

Connect Size	Actuation on Increasing Flow	Pressure Max.	Operating Temp (° F)	Catalog Number	Price
1/2" NPT*	0.5 GPM ± 20%	120 PSIG	120°	135805	\$81.00

\* 3/4" IPS model with 1/2 NPT port installed.



### Gems Shuttle Switches Rise to the Occasion!

Fluid, flowing through the switch housing, displaces a spring-loaded, calibrated shuttle, which is metered relative to a fixed orifice. When flow rate reaches the calibrated setpoint, the shuttle moves up to the stem, actuating the hermetically sealed reed switch. Flow switches respond only to **flow** — **not pressure!**

### Occasional Cleanout is a Snap!

Remove the bonnet easily without disturbing the inline body.



## Rugged Flow Switches Deliver Accurate, Reliable Service

FS-200 flow switches provide accurate flow detection with 1% repeatability. Bronze and Teflon® construction delivers long life in water and oil, and fluid temperatures to 300° F.

Setpoints are calibrated using water at 70° F on increasing flow with unit in a horizontal position (lead wires up).

**Operating Pressure:** 400 PSIG @ 100° F

**Operating Temperature:** -20° to 200° F

**Switch:** SPDT, 20 vA



### Model Selection Guide

Port Size	Flow Setting (GPM)	Bronze Body		Stainless Steel Body	
		Catalog Number	Price	Catalog Number	Price
1" NPT	0.5	27051	\$191.00	27059	\$569.00
	1	27052	191.00	27060	569.00
	2	27053	191.00	27061	569.00
	3	27054	191.00	27062	569.00
	4	27055	191.00	27063	569.00
	5	27056	191.00	27064	569.00
	6	27057	191.00	27065	569.00
	8	27058	191.00	27066	569.00
1-1/4" NPT	1	27067	365.00	27076	838.00
	2	27068	365.00	27077	838.00
	4	27069	365.00	27078	838.00
	6	27070	365.00	27079	838.00
	8	27071	365.00	27080	838.00
	10	27072	365.00	27081	838.00
	12	27073	365.00	27082	838.00
	16	27074	365.00	27083	838.00
	20	27075	365.00	27084	838.00
	1-1/2" NPT	1.5	27085	447.00	27093
3		27086	447.00	27094	881.00
5		27087	447.00	27095	881.00
7.5		27088	447.00	27096	881.00
10		27089	447.00	27097	881.00
15		27090	447.00	27098	881.00
20		27081	447.00	27099	881.00
30		27092	447.00	27100	881.00

# RCM Industries

# Direct Reading Flowmeters



### Specifications

- Accuracy:** ±3% full scale
- Range:** Flow rates to 500 GPM or 4000 SCFM; *Rangeability:* 6:1
- Mount:** Horizontal (standard), flow to the right
- Temperature:** 212°F max., 350°F max. optional
- Pressure:** 180 PSIG max., 400 PSIG max. optional
- Construction:** Diecast aluminum housing, glass or polycarbonate crystal, bronze body, bronze gear movement, Buna-N seals. Other materials available on request
- Options:** High/Low alarm relays, 4-20 mA, 0-1000 Hz output, digital display for flow rate/totalization

Shown with optional 4-20 mA loop-powered two-wire indicator. Displays 4-1/2 digits for flow rate, 8 digits for totalization. Includes scaled, open collector output for remote totalizer, and square root extraction for use with W3 solid-state strain gauge. Call for pricing.



RCM Series 8000 Flo-Gage® is designed for larger pipe sizes and mounts between adjoining flanges (ANSI 150#, 300#, DIN PN10, PN16, JIS, AS). Install the Flo-Gage just as you would install an orifice plate, with flat gaskets and bolts (order separately).

### Specifications

- Accuracy:** ±3% full scale; *Repeatability:* 1% full scale
- Range:** Flow rates to 3000 GPM liquid or 20000 SCFM gas; *Rangeability:* 6:1
- Mount:** Horizontal (standard), flow to the right
- Operating Conditions:** *Temperature:* 212° F max., 350° F opt.; *Pressure:* 180 PSIG max., 400 PSIG opt.
- Construction:** Bronze body, movement, ABS housing and crystal, Buna-N seal. Call for other materials
- Options:** *Relay:* High/Low alarms; *Output:* 4-20 mA, 0-1000 Hz frequency. *Optional Digital Display.*

**Intrinsically safe switches available. Call for pricing.**

### Model Selection Guide

Media Type	Range GPM Liquid	Fittings Flange Size	Catalog Number	Price
For Liquid	0.3 - 2.0	1/2"	1/2-81-R-02	\$470.00
	0.4 - 3.0	1/2"	1/2-81-R-03	470.00
	0.5 - 4.0	1/2"	1/2-81-R-04	470.00
	0.5 - 6.0	1/2"	1/2-81-R-06	470.00
	1.5 - 10	1/2"	1/2-81-R-10	470.00
	0.5 - 6.0	3/4"	3/4-81-R-06	530.00
	1.5 - 10	3/4"	3/4-81-R-10	530.00
	2.0 - 15	3/4"	3/4-81-R-15	530.00
	3.0 - 20	3/4"	3/4-81-R-20	530.00
	2.0 - 15	1"	1-81-R-15	555.00
	3.0 - 20	1"	1-81-R-20	555.00
	5.0 - 40	1"	1-81-R-40	555.00
	4.0 - 30	1-1/2"	1.5-81-R-30	630.00
	5.0 - 40	1-1/2"	1.5-81-R-40	630.00
	5.0 - 60	1-1/2"	1.5-81-R-60	630.00
	15 - 100	1-1/2"	1.5-81-R-100	630.00
	5.0 - 40	2"	2-81-R-40	730.00
	5.0 - 60	2"	2-81-R-60	730.00
	15 - 100	2"	2-81-R-100	730.00
	For Liquid	20 - 150	2"	2-81-R-150
30 - 200		2"	2-81-R-200	730.00
30 - 200		3"	3-81-R-200	915.00
40 - 300		3"	3-81-R-300	915.00
50 - 400		3"	3-81-R-400	915.00
60 - 500		3"	3-81-R-500	915.00
40 - 300		4"	4-81-R-300	995.00
50 - 400		4"	4-81-R-400	995.00
50 - 600		4"	4-81-R-600	995.00
100 - 800		4"	4-81-R-800	995.00
50 - 600		6"	6-81-R-600	1200.00
100 - 800		6"	6-81-R-800	1200.00
150 - 1000		6"	6-81-R-1000	1200.00
300 - 2000		6"	6-81-R-2000	1200.00
50 - 600		8"	8-81-R-600	1650.00
150 - 1000		8"	8-81-R-1000	1650.00
300 - 2000		8"	8-81-R-2000	1650.00
400 - 3000		8"	8-81-R-3000	1650.00

**Options: Add as suffix to catalog number**

Hi/Low alarm setpoint relays (Req 24 VDC power)	-X	350.00
4-20 mA loop-powered output	-W	600.00
0-100 Hz output	-Y	600.00
For gas applications	-I	85.00

Media Type	Flow Rate	NPT Connection	Catalog Number	Price	
For Liquid	0.5 - 6 GPH	1/2"	1/2-71-R-06-ES	\$ 580.00	
	3.0 - 20 GPH	1/2"	1/2-71-R-20-ES	580.00	
	5.0 - 60 GPH	1/2"	1/2-71-R-60-ES	580.00	
	15 - 100 GPH	1/2"	1/2-71-R-100-ES	580.00	
	0.5 - 4.0 GPM	1/4"	1/4-71-R-04	470.00	
	0.5 - 4.0 GPM	1/2"	1/2-71-R-04	470.00	
	0.5 - 6.0 GPM	1/2"	1/2-71-R-06	470.00	
	1.5 - 10 GPM	1/2"	1/2-71-R-10	470.00	
	0.5 - 6.0 GPM	3/4"	3/4-71-R-06	530.00	
	1.5 - 10 GPM	3/4"	3/4-71-R-10	530.00	
	3.0 - 20 GPM	3/4"	3/4-71-R-20	530.00	
	3.0 - 20 GPM	1"	1-71-R-20	555.00	
	5.0 - 40 GPM	1"	1-71-R-40	555.00	
	5.0 - 40 GPM	1-1/2"	1.5-71-R-40	630.00	
	15 - 100 GPM	1-1/2"	1.5-71-R-100	630.00	
	15 - 100 GPM	2"	2-71-R-100	730.00	
	For Air or Gas	5.0 - 40 SCFH	1/2"	1/2-71-R-40-IES	665.00
		15 - 100 SCFH	1/2"	1/2-71-R-100-IES	665.00
		30 - 200 SCFH	1/2"	1/2-71-R-200-IES	665.00
		50 - 400 SCFH	1/2"	1/2-71-R-400-IES	665.00
1.5 - 10 SCFM		1/4"	1/4-71-R-10-I	555.00	
4.0 - 30 SCFM		1/4"	1/4-71-R-30-I	555.00	
1.5 - 10 SCFM		1/2"	1/2-71-R-10-I	555.00	
4.0 - 30 SCFM		1/2"	1/2-71-R-30-I	555.00	
5.0 - 60 SCFM		1/2"	1/2-71-R-60-I	555.00	
5.0 - 60 SCFM		3/4"	3/4-71-R-60-I	615.00	
15 - 100 SCFM		3/4"	3/4-71-R-100-I	615.00	
30 - 200 SCFM		3/4"	3/4-71-R-200-I	615.00	
30 - 200 SCFM		1"	1-71-R-200-I	640.00	
50 - 600 SCFM		1-1/2"	1.5-71-R-600-I	715.00	
50 - 600 SCFM		2"	2-71-R-600-I	815.00	
150 - 1000 SCFM		2"	2-71-R-1000-I	815.00	
400 - 3000 SCFM		3"	3-71-R-3000-I	1000.00	

**Options: Add as suffix to catalog number**

Calibrate for specific gravity other than water	-C	85.00
Hi/Lo alarm setpoint relays (Req. 24 VDC power)	-X	350.00
NEMA 4X Gasketed Meter Case	-D	50.00

Level Measurement Instruments

Flow Measurement Instruments

Pressure Transmitter

Temperature Sensors and Transmitters

Wireless Sensing and Communications

Analytical Instruments and Systems

# Turbine Flowmeters for Gas and Liquid Service

## Low Cost Industrial Flowmeters for Liquid Measurement



### Features

- Simple construction allows for rugged and dependable service at low cost
- Off-the-shelf delivery; Companion electronics available in 10 to 15 days
- Outstanding accuracy at low cost, without compromise in design

### Specifications

- Flowmeter Size:** 1/4" to 3" diameter  
**Repeatable Flow Range:** 0.25 to 800 GPM  
**Accuracy and Linearity:**  $\pm 1.0\%$  reading or better  
**Repeatability:**  $\pm 0.1\%$  reading or better  
**Temperature:**  $-450^\circ$  to  $350^\circ$  F with UB bearing;  $-450^\circ$  to  $450^\circ$  F with C bearing  
**Signal Output:** 10 MVRMS or greater with 10K $\Omega$  load at minimum flow rate  
**Materials:** 316 stainless steel; Rotor: 17.4 PH stainless steel; Bearings: 440C stainless steel or hard carbon composite

## For Gas Service

### Features

- Radio frequency (RF or MCP) pickup coils provide wide rangeability
- Four blade angles available ( $15^\circ$ ,  $20^\circ$ ,  $25^\circ$ , and  $30^\circ$ ) per flowmeter size for optimum performance
- Shielded, self-lubricating ball bearings provide extended life



The design of these turbine gas meters minimizes drag effects, which results in wide ranges and long-term accuracy. All meters are equipped with special self-lubricating, long-life ball bearings and low-drag, magnetic, modulated carrier or pickups.

Gas turbine flowmeters are available with standard flanged,  $37^\circ$  flared, NPT, or special end fittings. Hazardous and weatherproof coil enclosures are available.

### Specifications

- Flowmeter Size:** 1/2" x 1/4" to 12" diameter  
**Linear Range:** 0.15 to 12,000 ACFM  
**Overrange:** 150% of maximum flow (intermittently)  
**Linearity:**  $\pm 1\%$  reading  
**Repeatability:**  $\pm 0.25\%$  over usable range  
**Temperature:**  $-450^\circ$  to  $350^\circ$  F, to  $400^\circ$  F intermittent heat  
**Bearings:** Ceramic hybrid ball bearings only  
**Materials:** 316 SS. Other materials available for corrosive applications.  
**End Fittings:** MS flared and flanged styles recommended

## For Liquid Service

### Features

- Threaded or flanged process connections
- Outstanding accuracy
- Provides wide flow ranges (10:1 to 100:1 turndown ranges available)
- Wide variety of process connections and construction materials
- Operates over wide range of temperatures and pressures



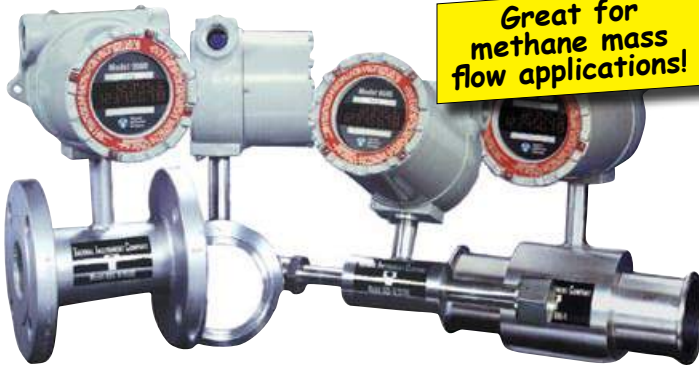
### Specifications

- Size:** 1/4" to 12" diameter  
**Linear Range:** 0.35 to 12,000 GPM  
**Overrange:** 150% of maximum flow (intermittently)  
**Linearity:**  $\pm 0.5\%$  reading ( $\pm 0.25\%$  typical) over tabulated linear flow range  
**Repeatability:**  $\pm 0.1\%$  ( $\pm 0.05\%$  typical) over tabulated repeatable range  
**Pressure Drop:** 4 to 5 PSI at maximum linear flow rate at one CSTK  
**Turndown:** 10:1 to 100:1  
**Temperature:**  $-450^\circ$  to  $450^\circ$  F; High temperature option to  $850^\circ$  F  
**End Fittings:** NPT, MS flared, and flanged; Others available  
**Bearings:** Ceramic hybrid ball bearings; Sleeve bearings in tungsten carbide; Teflon and hard carbon composite available  
**Materials:** 316 SS. Other materials available for corrosive applications.





## Thermal Dispersion Mass Flowmeters



Great for methane mass flow applications!

### Model 600-9 Inline Design

The Model 600-9 thermal mass flowmeter provides reliable, accurate flow measurement with no obstructions to the actual flow path. It handles liquids, slurries, gases, and homogeneous solids through a wide range of flow rate, temperature, pressure, viscosity, abrasiveness, or chemical compositions.

The 600-9's sensor is built into the meter's outer surface and is completely protected from adverse process conditions. The spool matches the actual flow pipe in dimensions and construction material, and is impervious to fluid, as is the rest of the line.

System electronics include the flow analyzer, temperature compensator, and signal conditioner to provide a linear output directly proportional to mass flow. An optional output provides continuous temperature measurement.

Call or visit our website for more information.

### Model 62-9 Insertion Design



The Thermal Model 62-9 flow probe is designed to measure the flow rates of gases, liquids, or slurries in stacks, irregularly shaped lines, and process ducts. Unlike other probe flowmeters, the 62-9 has no apertures that can become clogged with particles or distorted by heat. The sensing element is located on the probe's inside leading edge and has no contact with the flow stream.

The 62-9 can be made of pipe or tubing using any metal compatible with the flow stream of a given application. It can also be built with extra length, so it can be inserted through a gate valve and packing gland. This will allow easy insertion and removal while the pipe is in use.

The thermal probe's electrical connections can be made either in a gasketed-type conduit or an explosion-proof conduit. For applications over 350° F, the sensors are made of platinum embedded in a ceramic matrix, securely bonded to the pipe's inside diameter. An additional temperature sensor can also be installed, as well as independent circuitry to provide fluid temperature readout signals.

#### Specifications

**Accuracy:** Better of  $\pm 1\%$  full scale or 4% reading; **Repeatability:** Better than 0.2% reading; **Linearity:** 0.5%

**Temperature Limits:**  $-20^{\circ}$  to  $350^{\circ}$  F; **Calibrated Temperature Range:**  $\pm 50^{\circ}$  F

**Pressure Limits:** 0 to 1200 PSI (Max. pressure ratings depend on pipe size.)

**Pressure Range:** *Liquids:* Unlimited; *Gases:* 20 atmospheres

**Response Time:** *Liquids:* Less than 1/2 second; *Gases:* 1 to 2 seconds typical, 4 to 8 seconds worst case

**Pressure Drop:** Negligible, completely unobstructed flow path

**Viscosity:** Up to 5000 cps

**Flow Rate:** (Volumetric flow units for gases should be expressed in standard or normal units.) *Liquids:* 0.003 grams/min minimum full scale; *Gases:* 2 SLPM minimum full scale. Maximum determined by pipe capacity.

**Flow Range:** 10:1 (100:1, 1000:1, multiple ranges available)

**Flow Element:** Meets NEMA 4, 7, and 9 explosion-proof requirements. *Electrical connection:* 1/2"; *Construction:* 316 SS standard (316 SS, 304 SS Hastelloy®, Monel, Inconel®, tantalum, titanium, gold, platinum, nickel, Carpenter 20®, glass); *Connections:* Flanged, Swagelok®, NPT, VCR, VCO, Tri-Clamp, concentric reducer, flared, sanitary, high pressure fittings, wafer, barbed, welded, others; *Coatings:* Teflon®, tungsten, carbide, HMF®

**Remote Flow Transmitter:** *Model 9200:* Panel or wall mount; *Model 926A:* NEMA 4 JIC type; *Model 926B:* NEMA 4, 7, and 9 explosion-proof. Others available upon request

**Outputs:** Standard 4-20 mA DC isolated/1000 $\Omega$  max. load (0-10V DC, 0-5VDC, 10-50 mA DC, pulse output)

**Options:** Digital flow indication, 8-digit LED totalizer, batch counter, hi/lo alarm setpoints, bidirectional flow, temperature output, multiple ranges

#### Specifications

**Flow Range:** 10:1 (100:1, 1000:1, multiple ranges available)

**Flow Limits:** (Volumetric flow units for gases should be expressed in standard or normal units.) *Liquids:* 0.02 FPS to 20 FPS FS; *Gases:* 40 SFPM to 15000 SFPM FS. Maximum determined by pipe capacity.

**Accuracy:** Better of  $\pm 0.5\%$  full scale or 2% reading. Calibrated by weight or volume (0.5% FS). **Repeatability:** Better than 0.2% reading; **Linearity:** 0.5%

**Temperature Limits:**  $-20^{\circ}$  to  $1100^{\circ}$  F; **Calibrated Temperature Range:**  $\pm 50^{\circ}$  F

**Pressure Limits:** 0 to 60000 depending on size PSI

**Response Time:** *Liquids:* Less than 1/2 second; *Gases:* 1 to 2 seconds typical, 4 to 8 seconds worst case

**Viscosity:** Up to 5000 cps

**Flow Element:** Meets NEMA 4, 7, and 9 explosion-proof standards. *Construction:* 316 SS standard; *Connections:* Flanged, Swagelok®, NPT sanitary Tri-Clamp, hot tapping, retractable, saddle mount; *Coatings:* Teflon®, HMF®, Nedox®

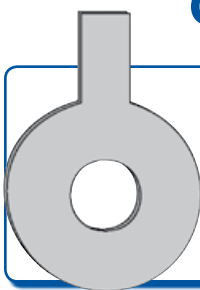
**Remote Flow Transmitter:** *Model 9200:* Panel mount or NEMA 4 box; *Model 926A:* NEMA 4 JIC; *Model 926B:* NEMA 4, 7, and 9 explosion-proof.

**Pipe Size:** 1" minimum

**Outputs:** Standard 4-20 mA DC isolated/1000 $\Omega$  max. load (0-10V DC, 0-5VDC, 10-50 mA DC, pulse output)

**Options:** Digital flow indication, 8-digit LED totalizer, batch counter, hi/lo alarm setpoints, bidirectional flow, temperature output, multiple ranges, flow profile, multipoint, averaging

## Orifice Plates, Flange Unions, and Pitot Tubes



**Please allow 10 days for delivery.**

If you need your order faster, just let us know. In most cases, we can arrange for overnight or second-day shipping. Or, we'll work with you to arrange delivery by local messenger service. Same-day shipping is available for a small premium.

### Paddle-Type Orifice Plates

#### Build a Paddle Type Orifice Plate Part Number

Pipe Size	Flange Rating	Full Face Flange?	Plate Thickness	Plate Material	Bore Style	Weep Hole?
----	--	--	01	--	C	-
See Chart Below	See Chart Below	Yes=FF No=Blank	1/8"	304SS=04 316SS=16	Concentric	Drain or Vent=W No=Blank

What bore size do you need? \_\_\_\_\_

*Not sure what bore size you need? We can calculate it for you. (\$35 flat fee.)*

If you need a drain or vent, specify Pipe Schedule or ID: \_\_\_\_\_

### Raised Face Weld Neck Orifice Flange Unions

All raised face flange unions are made of A105 carbon steel and include nuts, bolts, and 1/16" gasket.

#### Build a Raised Face Weld Neck Orifice Flange Part Number

Pipe Size	Flange Rating	Material Grade	Face Style	Flange Style	Pipe Schedule	Hardware
----	--	CS	R	WN	40	C
See Chart Below	300#=03 600#=06 (No 150#)	A105 Carbon Steel	Raised Face	Weld Neck	Schedule 40	Complete with Nuts, Bolts, and Gaskets

#### Pipe Size and Flange Rating Options

(1) Select Your Pipe Size					
Pipe Size	Code	Pipe Size	Code	Pipe Size	Code
0.5"	0050	3"	0300	14"	1400
0.75"	0750	4"	0400	16"	1600
1"	0100	5"	0500	18"	1800
1.25"	0125	6"	0600	20"	2000
1.5"	0150	8"	0800	24"	2400
2"	0200	10"	1000	30"	3000
2.5"	0250	12"	1200	36"	3600
(2) Specify the Flange Rating					
Flange	Code	Flange	Code	Flange	Code
150#	01	300#	03	600#	06

### Other Flow Elements

#### Pitot Tubes

Inline sensors for measuring flow in pipe lines from 1/2" to 3" nominal size. Uses two averaging probes of equal area to sense differential pressure loss while providing minimum permanent pressure loss.

Probe or insert-type sensors for measuring flow in pipelines from 3" to 24", using equal area double averaging pitot tubes for low permanent pressure loss.



#### Venturi Flow Elements

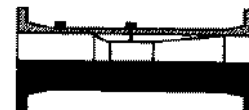
##### Herschel Type

Classic style Venturi tube designed in accordance with ASME or ISO standards and offers a constant degree of accuracy and high repeatability.



##### Venturi-Nozzle Type

Design uses the classical ASME and ISO standards for highest accuracy, predictability, and repeatability. Flow conditioning generated by unique hydraulic shape provides a stable signal in a wide range of flows.



##### Low-Loss Design (Short-Form)

Design provides proven field performance in a variety of applications. Low installation cost due to short laying length, reduced operating costs, and a wide range of sizes and materials add up to the right choice for your needs.

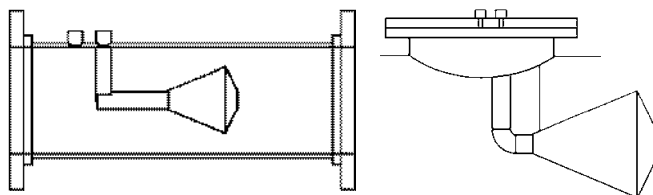


#### Bluff Body Differential Pressure Flowmeters

The bluff body flowmeter is the only differential pressure flowmeter that fully conditions the flow prior to measurement. It's ideal for lines with limited straight piping. This flowmeter provides repeatable accuracy up to  $\pm 0.5\%$  flow rate, even under the most difficult flow conditions, and over a wide range of Reynolds numbers.

Because this meter can accurately measure disturbed flow, it doesn't require the upstream or downstream straight pipe runs of many other flowmeters; so, it can fit where other flowmeters can't because of limited space or weight requirements.

**Left:** Precision flow tube, **Right:** Insertion weld-on saddle.





# Smart Multivariable Flowmeter for Gas and Steam



**Ranges**  
**Differential Pressure:** ±400" H<sub>2</sub>O  
**Absolute Pressure:** 0 to 750 PSIA  
**Process Temperature:** -328° to 842° F



### Features

- Single sensor measures absolute and differential pressure from one pipe intrusion
- Calculations for volumetric or mass flow rate, linear or square root output conformity for differential pressure, and engineering units display for PV, flow rates
- Improves efficiency in commissioning, start-up, and on-going maintenance through local and remote interface with SmartLine Configuration Toolkit and host system

### Condensed Specifications

**Temperature:** -40° to 200° F; *Meter Body:* -40° to 257° F  
**Pressure:** 1" H<sub>2</sub>O Abs for 2 hrs @ 158° F min.; *Overpressure:* 3000 PSI  
**Two-Wire Output:** 4–20 mA or digital (DE protocol)  
**RFI Protection (Std.):** Negligible effect (20–1000 MHz @ 30V/meter)  
**Materials:** *Process Interface:* 316L SS, Hastelloy C-276, Monel, Tantalum diaphragms; 316 SS, Carbon Steel, Monel, Hastelloy process heads; Teflon, Viton head gaskets; Carbon Steel, A286 SS (NACE) bolting; *Mounting Bracket:* Carbon Steel; *Electronics Housing:* Low Copper Aluminum  
**Hazardous Conditions:** Housing meets NEMA 4 (watertight) and NEMA 7 (explosion-proof); FM, CSA, ATEX approval available.

### Differential Pressure Measurement

**Upper Range Limit (URL):** 400" H<sub>2</sub>O (1000 mbar)  
**Turndown Ratio:** ±400:1  
**Minimum Span:** 20" H<sub>2</sub>O square root; 1" H<sub>2</sub>O linear  
**Zero Elevation/Suppression:** No limit (min. span) within ±100% URL.  
**Accuracy:** *Analog Mode:* Greater of ±0.10% calibrated span or URV; *Digital Mode:* Lesser of ±0.075% calibrated span or ±0.15% reading.

### Absolute Pressure Measurement

**Upper Range Limit (URL):** 750 PSIA; *Minimum Span:* 5 PSIA  
**Turndown Ratio:** 150:1  
**Accuracy:** *Analog Mode:* Greater of ±0.10% calibrated span or URV; *Digital Mode:* Lesser of ±0.075% calibrated span or ±0.15% reading.

### Temperature Measurement

**Range (Pt100Ω RTD):** -328° to 1562° F operating; 1.08° F accuracy  
**Adjustment Range:** Limit to zero/span within range.  
**Accuracy (Reference):** *Analog Mode:* Digital accuracy + Output D/A accuracy; *Digital Mode:* Digital accuracy; **(Output D/A):** ±0.025% of span  
**Thermocouple Burnout:** User-selectable detection: ON = up- or down-scale failsafe action, critical status message for any open lead.



Looking for differential pressure smart transmitters for your flow applications? See pages 86 to 89.

### Ordering Instructions

Make one selection from each table section below. Check any restriction letters or notes (E.g.: N3) to be sure the unit is available. A finished catalog number looks like this: SMA110-E1A-00000-S2,MB,F1C3-XXXX

### Model Selection Guide

Description				Catalog Number	Availability			Price	
Differential Pressure Range		Pressure Range							
0"-1" / 25" H <sub>2</sub> O		0-100 PSIA		SMA110	↓			\$2939.00	
0"-1" / 400" H <sub>2</sub> O		0-750 PSIA		SMA125		↓		2873.00	
0"-1" / 400" H <sub>2</sub> O		0-3000 PSIG		SMG170			↓	2938.00	
Material	Process Head	Vent/Drain Valve, Plug	Barrier Diaphragm						
	Carbon Steel	316 SS	316L SS	A __	•	•	•	0.00	
	316 SS	316 SS	316L SS	E __	•	•	•	77.00	
	Hastelloy C	Hastelloy C	Hastelloy C	J __	v	v	v	1608.00	
	Monel	Monel	Monel	L __	v	v	v	821.00	
Fill Fluid	Silicone			_ 1 _	•	•	•	0.00	
	CTFE			_ 2 _	•	•	•	57.00	
Process Head	1/4" NPT			_ _ A	•	•	•	0.00	
	1/2" NPT with Adapter (1/4" NPT Head)			_ _ H	t	t	t	0.00	
No Selection				00000	•	•	•	0.00	
None				00	•	•	•	0.00	
Analog Meter (0-100 Even, 0-10 Sq. Root.)				ME	•	•	•	170.00	
Viton Head Gaskets (1/2" Gaskets Special)				VT	•	•	•	0.00	
Mounting Bracket — Carbon Steel				MB	•	•	•	20.00	
Mounting Bracket — Stainless Steel				SB	b	•	•	75.00	
Flat Mounting Bracket — Carbon Steel				FB		•	•	20.00	
Lightning Protection				LP	•	•	•	68.00	
Stainless Steel Customer Wired-On Tag (4 Lines, 28 Char/Line, User-Supplied Info.)				TG	•	•	•	24.00	
Multivariable Transmitter Configuration				MC	•	•	•	85.00	
Write Protection				WP	•	•	•	22.00	
Clean for Oxygen/Chlorine Service, Certificate				OX	j	j	j	211.00	
FM	Approval Type		Location/Class						
	Explosion Proof		Cl I, Div 1, Gr A-D	1C	b	•	•	•	0.00
	Dust Ignition Proof		Cl II, III, Div 1, Gr E-G						
	Suitable for		Cl III, Div 1						
	Non-Incendive		Cl I, Div 2, Gr A-D						
	Intrinsically Safe		Cl I, II, III, Div 1, Gr A-G						
Explosion Proof		Cl I, Div 1, Gr B-D	1J	b	•	•	•	0.00	
Dust Ignition Proof		Cl II, III, Div 1, Gr E-G							
Suitable for		Cl III, Div 1							
Non-Incendive		Cl I, Div 2, Gr A-D							
Intrinsically Safe		Cl I, II, III, Div 1, Gr A-G							

### Restrictions

- b Select only one option from this group.
- j Available only on units with CTFE fill ( \_ 2 \_ in Fill Fluid).
- t Available only with 1/2" NPT adapter flange (Options S2, T2, or V2).
- v Includes side vent drain at no added cost.
- w Available only with 316SS process heads. Not available with side vent/drain (SV).

See page 96 for Honeywell SCT3000 smart configuration toolkit.

Add a three-valve manifold to your transmitter! See page 345. For 100Ω RTDs, see page 98.

## Honeywell VersaFlow — Flowmeters for Any Application



### Electromagnetic Flowmeter

- Conductivity down to 1 uS/cm
- Temperatures to 356° F (180° C)
- Available sizes 0.1" to 80" (DN 2.5-3000)
- Stainless steel flow tube spool with carbon steel or stainless steel flanges
- Standard liner materials: PTFE, PFA, ETFE, hard rubber, and polyurethane
- Electrodes available in 316 stainless steel, Hastelloy C, platinum, titanium, tantalum, carbon, PTFE, and Cermet
- Signal converters available in wall mount, rack mount, compact, and field-ready housings
- Signal converter offers local display, infrared interface, HART communications, four isolated outputs
- Diagnostics to standards better than requested by NAMUR 2650: 100% flow sensor and converter check, 100% process/application check, 100% linearity/calibration check
- Accuracy to  $\pm 0.15\%$  measured value
- Suitable for all conductive applications
- Measures flow in any application, from clean liquids to slurries and pastes with high solids content
- Abrasion-, chemical-, and vacuum-resistant

VersaFlow magnetic flowmeter is suitable for a variety of measuring tasks and applications, including rapidly changing media, pH jumps, large amounts of solids, or pulsating flow. It delivers significant cost savings during planning, procurement, installation, and training.

VersaFlow is wired exactly like a traditional magmeter, but no earth connection to the liquid is required. This reduces the high costs involved with purchasing exotic metal grounding rings or electrodes.

A new virtual reference grounding eliminates the need for grounding electrodes or rings, reducing installation costs and potential leak points. It provides complete isolation with opto-couplers of the flow converter's input amplifier and coil power circuits. The measurement circuit "floats" at liquid's potential, sensing only the induced voltage caused by the velocity of the conductive liquid flowing through the sensor.

A calibrated flow simulator is available for magmeters to troubleshoot converter and other system indicators and controls. It replaces the flow sensor in the system and simulates no-flow and up to five flow rates to troubleshoot flow output issues.

### Coriolis Mass Flowmeter

- Innovative twin measuring tube sensors with optimized flow divider for minimal pressure loss
- For applications up to 266° F (130° C)
- Measures from 0.3 to 430,000 kg/h flow
- Pressure-resistant jacket to 1450 PSI (100 bar)
- Excellent zero stability
- Available with hygienic process connections for food and pharmaceutical applications
- Rapid signal processing, even with product and temperature changes or sudden changes in density
- Modular electronics concept and data redundancy – sensor and plug-and-play electronics are easy to replace
- Viscous or shear-sensitive products
- Products requiring low flow velocities, products with entrained solids or gas, or products in homogeneous mixtures
- Flow and purity measurement, density, temperature, and concentration measurement

VersaFlow coriolis measures mass flow, density, volume, temperature, mass, or volume concentration and solids content with a single device. It's the only Coriolis sensor for mass flow in its class with secondary pressure containment standard. It offers a high degree of accuracy, even for problematic applications. All meters consist of a sensor and a converter. The converter is mounted integral to the sensor or remotely via a field-mount kit, a wall-mount housing, or a 19" rack-mount module.

#### Condensed Specifications

**Flow Rate:** 0–240 to 0–15800 lbs/min, depending on sensor model

**Accuracy:** *Liquid:*  $\pm 0.15\%$  actual measured flow rate; *Gas:*  $\pm 0.5\%$  actual measured flow rate

**Density Measuring Range:** 25-155 Lbs/Ft<sup>3</sup> (400-2500 Kg/m<sup>3</sup>)

**Temperature Measuring Range:** -40° to 302° F (-40° to 150° C); *Accuracy:*  $\pm 1.8^\circ$  F (1° C)

**Materials:** Sensors available in Stainless steel, Titanium, Hastelloy, or Tantalum, aluminum or stainless steel housings

**Approvals:** FM, CSA, ATEX, 3A (depending on model selected)

See our viscosity table for common substances, page 489.

# Honeywell



## Vortex Flowmeter

- Works with conductive or non-conductive liquids, industrial compressed gases
- Sensors with 0.5" to 12" flanges or 0.5" to 4" sandwich sizes
- Two-wire device with integrated pressure and temperature compensation, plus compensation for saturated steam
- Non-wearing, fully welded stainless steel construction with high corrosion, pressure, and temperature resistance
- Optimal process reliability: Intelligent stable readings, free of external signal processing
- Maintenance-free sensor design
- Current, pulse, and HART communications outputs

For superheated and saturated steam measurement, steam boiler monitoring, compressor output monitoring, measuring consumption in compressed air systems, measuring consumption of industrial gases, SIP and CIP processes in the food, beverage, and pharmaceutical industries

VersaFlow 100 is the only vortex flowmeter with integrated pressure and temperature compensation in two-wire technology, providing maximum performance at the lowest installed cost. VersaFlow provides reliable measurement of operating, standard volumetric, and mass flow of conductive and non-conductive liquids, gases, and vapors, even with fluctuating pressures and temperatures.

### Condensed Specifications

**Measuring Principle:** Karman vortex street

**Measured Value:** *Primary:* Number of separated vortices; *Secondary:* Operating and standard volumetric flow or mass flow

**Accuracy:** Reynolds numbers ( $Re$ )  $\geq 20000$ :  $\pm 0.75\%$  for liquids,  $Re \geq 20000$ :  $\pm 1\%$  for gases or vapors;  $10000 < Re < 20000$ :  $\pm 2\%$  for liquids, gases, or vapors; *Repeatability:*  $\pm 0.1\%$ ; *Stability:*  $\pm 0.1\%$  over 1 year

**Process Medium Viscosity:**  $< 10$  cP

**Outputs:** *Current:* 4-20 mA; *Pulse:* Pulse frequency 0.5 Hz; *Communications:* HART® protocol

**Approvals:** FM: Class 1, Div 1; ATEX: II 2G EEx d ia [ia] IIC T6

## VersaFlow Vortex for Monitoring Steam Production and Transfer

### Cost of a steam leak

There are two costs associated with the production of steam. The first is the gas feed to the boiler. The other is in monitoring the efficiency of the lines transporting the steam.

The major concern, once a line is designed, is the integrity of the pipeline and how much steam is being lost to leakage.

By placing a vortex meter at the discharge of the boiler and taking advantage of the integral temperature measurement, you can accurately measure the generated steam. If you have a flow meter on the gas feed line, you can monitor boiler efficiency by comparing gas use to pounds of steam produced.

Then, by placing another vortex meter at a designated spot further downstream of the boiler, you can make the measurement again and compare the flow rate of the steam to what's coming off the boiler. Any reduction in flow not accounted for by any usage points in between can be attributed to leakage.

As you can see in the table, even a small leak can cost thousands of dollars per year, not including the additional cost it takes to manufacture more steam to compensate for the loss. Left unchecked, a 1/2" leak can cost upwards of \$50,000 per year.

### Cost of steam leaks, given 100 PSI steam flow, at \$5.00 per 1000 pounds.

Size of Leak	Steam Loss per Month (Lbs)	Total Cost per Month	Annual Cost
1/8"	52,500	\$262.50	\$3,150.00
3/16"	117,000	\$585.00	\$7,020.00
1/4"	210,000	\$1,050.00	\$12,600.00
5/16"	325,000	\$1,625.00	\$19,500.00
3/8"	470,000	\$2,350.00	\$28,200.00
7/16"	637,000	\$3,185.00	\$38,220.00
1/2"	835,000	\$4,175.00	\$50,100.00

One pound of 100 PSI steam contains about 1,200 BTUs. 1 MCF of natural gas contains 1 million BTUs.

If the steam is produced at 85% efficiency, the input energy is 1411 BTUs per pound. ( $1200/0.85=1411$ ) So, 1000 pounds of steam requires 1.4 million BTUs to produce it. The cost to produce 1000 pounds of steam from natural gas is 1.4 x cost/MCF. So, when natural gas costs \$7/MCF, the cost of 1000 pounds of steam is \$9.80.

Further, by using the vortex meter's local display or the HART® protocol, you can track temperature and see any extraordinary heat loss from where you measured at the boiler. Heat loss means energy costs, so tracking this variable can be critical.

Honeywell's VersaFlow vortex meter is the only meter of its type that offers integral temperature compensation standard, and integral pressure compensation as an option. These features improve accuracy and significantly reduce energy costs. VersaFlow can also be used for:

- Burner consumption measurement
- Controlling compressor capacity, consumption measurement in compressed air networks
- SIP and CIP processes in the food, beverage, and pharmaceutical industries
- Measuring industrial gases (natural gas, oxygen, nitrogen, hydrogen, and argon)
- Conductive and non-conductive liquids



# SITRANS FM MAGFLO Electromagnetic Flowmeters



MAGFLO flowmeters make it easier for you to manage flow. Whether it's installation, managing operations, or verifying continuous accuracy, our customers rely on Siemens MAGFLO to improve their processes.

## Greater Flexibility and Expandability

- One transmitter/converter electronics box fits all sensor tubes
- Choice of integral mount, remote pipe or wall mount, explosion-proof, or 19" rack mount electronics styles available
- Ready for your plant data network! Universal communications slot on each converter
- Communication modules for HART®, Modbus RTU, Profibus PA/DP. Add-on modules allow upgrades without buying a new flowmeter

## Easier to Operate

- Mag 5100W doesn't require grounding rings
- Robust construction and materials: PTFE, PFA, Ceramic, and NOVALAK liners; AISI 316 Ti stainless steel, Hastelloy C, Titanium, Tantalum, and Platinum electrodes
- Only Siemens offers NOVALAK, a revolutionary liner material with a smooth, hard, non-porous finish that provides the highest level of protection against corrosion, abrasion, high pressure and temperature, and vacuum conditions. It has the chemical resistance you expect from PTFE with the mechanical strength and stability of steel.
- Uniform user interface for all MAGFLO products

## Easier to Commission

- Pushbuttons on transmitter electronics make setup easy for technicians and contractors
- SensorPROM holds identity of each flowmeter: Calibration data, magnetic properties, user setup, and programming.
- SensorPROM module enables instant measurement at power-up

## Easier to Service

- Transmitter replacement requires no programming
- SensorPROM automatically updates all settings after initialization

## Advanced Diagnostics of Application and Metering

- Identification in clear text and error log
- Error categories: Function, warning, permanent, and fatal
- Transmitter self-check including outputs and accuracy
- Sensor check function
- Overflow
- Empty pipe, partial filling, low conductivity, electrode fouling
- System verification with MAGFLO Vericator

## Flexible Transmitter Electronics

Choose between Mag 5000 ( $\pm 0.5\%$  accuracy) and Mag 6000 ( $\pm 0.25\%$  accuracy) for high performance, easy operation, and reduced maintenance. Mag 5000 is a robust solution for all-around applications. Mag 6000 is for the more demanding applications where higher accuracy and greater functionality are required.

The Mag 6000i (Industry) transmitter is designed for the special demands in the process industry. The robust, full-metal housing provides superb protection, even in the harshest industrial environments. Full input and output functionality is provided, even in the ATEX EEx d version.



Individual calibration and fingerprint (magnetic property) data are pre-programmed at the factory and stored in the MAGFLO's SensorPROM module. Setup data is added during configuration. This unique combination ensures a cost-effective, easy, and error-free installation.

Plug and play communication modules make your MAGFLO compatible with your plant network protocol. Changing communications standards or moving the MAGFLO to a different network? Just swap out the communications module. No need to buy a new magmeter.

## Sensor Tube Designs for Every Industry

**Mag 5100W:** A sensor for all water and wastewater applications. With its coned design, increased low-flow accuracy is achieved, making it especially useful for leak detection. It can be made suitable for direct burial and constant flooding. Mag 5100W complies with drinking water and custody transfer approvals.



**Mag 1100:** The flangeless wafer design that meets all flange standards. The Mag 1100 is used in all industries where the corrosion-resistant stainless steel housing and highly resistant liner and electrodes fit even the most extreme process media. Mag 1100s are available with FM and ATEX approvals for installations in hazardous areas.

Its obstruction-free performance minimizes the risk of deposits. And, it's unaffected by the suspended solids, viscosity, and temperatures typically found in pharmaceutical processes. The Mag 1100 is suitable for CIP and SIP cleaning, and withstands the high pressures of hose-down.

**Mag 1100 Food:** Specially designed for the food and beverage industry, Mag 1100F offers unique and flexible process connections. Mag 1100F was the first to pass EHEDG hygienic test and meets all sanitary standards. Its performance is unaffected by suspended solids, viscosity, and temperature changes.

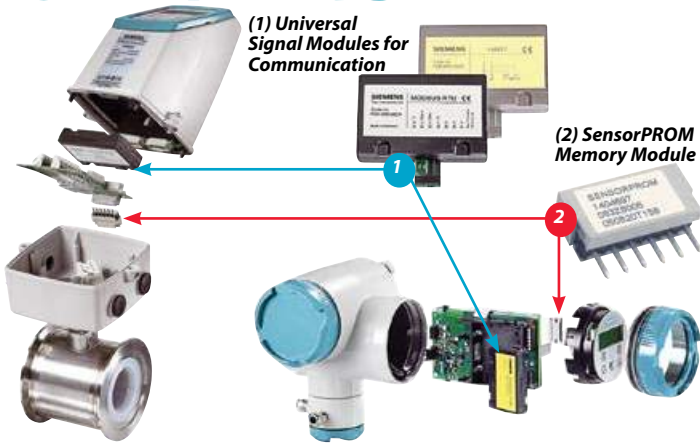


The Mag 1100F features an AISI 316 stainless steel enclosure with an IP67/NEMA 4X rating that is upgradable to IP68/NEMA 6P. It's delivered with your choice of flange adapter, with metal-to-metal design, and no grounding connection required.



**Siemens has  
Tri-Clover and  
Tri-Clamp adapters  
in stock, ready for  
quick assembly and  
shipment!**

# SIEMENS



Plug and Play communication modules and swappable SensorPROM memory module make replacing electronics quick and painless!

**Mag 3100:** This flexible and comprehensive sensor program offers a wide range of sizes, to fit a wide variety of general industry applications. Liners and measuring electrodes capable of withstanding the most extreme processes are available. All welded construction provides a ruggedness that suits the toughest environments.

**Mag 3100P:** Designed to meet the most common specifications in the chemical and process industries. It features fully welded construction for ruggedness, and PTFE or PFA liners and Hastelloy electrodes for flexibility.

**Mag 8000W:** These battery-powered units give you the flexibility to install a reliable water meter almost anywhere, without sacrificing accuracy or performance. It's optimized for leakage detection and accurate billing.

The Mag 8000W features a datalogger with selectable log interval up to 26 months, an infrared (IrDA) port for on-site downloads, power management with selectable battery alarm levels, a self-check feature with automated data backup, and three totalizers, one with user reset.

### Transmag 2: For Heavy-Duty Applications

Thanks to its pulsed AC system, the Transmag 2 is capable of measuring where conventional DC field technology fails, including applications with high concentrations of pulp stock, heavy slurries, or slurries with magnetic particles.

Magnetic particles in the media boost the magnetic field in the flowmeter and cause bad readings. Transmag 2 overcomes this issue with a second compensating coil circuit. The alternating field technology generates a much stronger magnetic field within the sensor, to measure more reliability and with greater precision — even when the media has a high concentration of solids.

There's a solution to every abrasive media application, and the choice of construction material is crucial to protect the flowmeter. Besides inlet protection rings, Siemens offers a broad range of liner and electrode materials — like the soft LINATEX rubber and NOVALAK liner, which have proven themselves in these harsh environments.



## Why Do So Many Engineers Choose MAGFLO?

- Mag 5100W doesn't need grounding rings.
- One transmitter fits all sensor tubes, so one universal spare covers all applications.
- Easy transmitter configuration with the keypad — contractors and technicians love them!
- Owners can schedule on-site verification service from Siemens, or do their own verification with a MAGFLO Verificator unit.
- SensorPROM makes replacement server a quick swap-out.
- With the universal communication modules, it's easy to get data onto the plant network.
- They can produce a traceable record of reliability, with calibration data and verification test results.

### In-Situ Verification

Using the MAGFLO Verificator, Siemens offers in-situ verification for documenting continuous accuracy for critical process applications — especially crucial when your application is required to meet ISO 9001, ISO 4001 or other quality management programs.

Through in-depth analysis, Siemens has identified the parameters that influence the accuracy of a flowmeter operating in the real world. These parameters are checked using a patented verification technique for MAGFLO flowmeters.

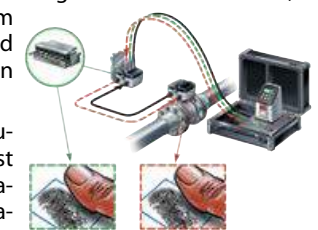
In-situ verification requires no interruption of flow, no opening of pipes, and no disconnection of cabling. The Verificator can run a full installation test of the transmitter, sensor, and cabling — all in less than 15 minutes!

**Transmitter Test:** The transmitter test is a flow simulation test that checks the whole electronic system from signal input to output. Using the magnetic field energy, the Verificator simulates a flow signal to the transmitter input. By measuring transmitter output, the Verificator calculates its accuracy against factory-defined values.

**Flowmeter Insulation Test:** This "cross-talk" test of the entire flowmeter ensures that the sensor flow signal is unaffected by external influences. In this test, the Verificator generates a high voltage disturbance within the coil circuit, and then looks for any cross-talk induced in the flow signal circuit. By generating dynamic disturbances close to the flow signal, the flowmeter is tested for noise immunity to a maximum level.

**Sensor Magnetism Test:** This "boost" test of the magnetic field coil ensures that the electromagnetic signal meets the original settings. In the boost test, the Verificator changes the magnetic field pattern and uses high voltage to get quick stable magnetic conditions. Then, it compares the current sensor magnetism to the factory "fingerprint" determined during initial calibration, and stored in SensorPROM.

An authorized, signed certificate documents the verification, and includes test results with pass/fail approval, installation specifications, flowmeter specification and configuration, and Verificator specification with calibration date (to ensure traceability to national and international standards.)



Level Measurement Instruments

Flow Measurement Instruments

Pressure Transmitter

Temperature Sensors and Transmitters

Wireless Sensing and Communications

Analytical Instruments and Systems

## SITRANS FM MAGFLO Electromagnetic Flowmeters



**Integral Mount**  
Mag 5000/Mag 6000



**Rack/Panel Mount**  
Mag 5000/Mag 6000



**Remote Mount**  
Mag 6000i (Ex d)



**MAGFLO Verificator**



**SensorPROM**  
Memory Module

# SIEMENS



**Communication**  
Modules



**Wall mount Junction**  
Box for Mag 5000/6000

**Call for**  
**Verificator**  
**service**

### MAGFLO Transmitter Electronics

- ULc Approved FM Class 1, Div 2
- Rated NEMA 4X and NEMA 6
- Choice of 115–230 VAC or 12–24 VAC/VDC Power
- 3-Line, 20-Character Backlit Display
- Can be Ordered Blind (No Local Digital Display)

### MAGFLO Mag 5000

- $\pm 0.5\%$  Accuracy with All Sensors
- 1 Current, 1 Digital, 1 Relay Output Standard
- Available with HART® Communication
- Only Available for Sensors 1/2" to 48"

### MAGFLO Mag 6000

- $\pm 0.25\%$  Accuracy with Selected Sensors
- Advanced Batch Control Functions
- Add-On Plug-In Communication Modules
- Required for Use with Sensors Larger than 56"
- Optional Design: Mag 6000i Industrial Enclosure

### Model Selection Guide

Description	Catalog Number	Price
<b>Mag 5000 Transmitters; Max. Measuring Error: 0.5% of Flow Rate</b>		
Integral Mount, 115-230 VAC	7ME6910-1AA10-1AA0	\$1318.75
Integral Mount, 11-30 VDC 11-24 VAC	7ME6910-1AA30-1AA0	1318.75
Integral Mount, No Display, 115-230 VAC	7ME6910-1AA10-0AA0	1093.75
Integral Mount, HART®, 115-230 VAC	7ME6910-1AA10-1BA0	1525.00
Rack Mount, 115-230 VAC	7ME6910-2CA10-1AA0	1525.00
<b>Mag 6000 Transmitters: Max. Measuring Error: 0.25% of Flow Rate</b>		
Integral Mount, 115-230 VAC	7ME6920-1AA10-1AA0	1552.50
Integral Mount, 11-30 VDC 11-24 VAC	7ME6920-1AA30-1AA0	1552.50
Rack Mount, IP20/NEMA 2, 115-230 VAC	7ME6920-2CA10-1AA0	1776.25
IP66/NEMA 4 ABS Plastic Enclosure, 115-230 VAC	7ME6920-2EA10-1AA0	1797.50
<b>Mag 6000i Transmitter: Max. Measuring Error: 0.25% of Flow Rate</b>		
Remote Mount IP67/NEMA 4X		
Aluminum Enclosure 10-220 VDC/AC	7ME6930-2BA20-1AA2	2053.75
<b>Mounting Kits and Hardware</b>		
Wall Mount Junction Box IP67/NEMA 4X/6	FDK:085U1053	230.00
Submersible Kit for Terminal Box, for IP68, 10m w.g. Rating	FDK:085U0220	141.25
21TE Panel Mount Kit for 19" Insert		
IP65/NEMA4 Enclosure in ABS Plastic	FDK:083F5030	390.00
21TE Back Panel Mount Kit for 19" Insert		
IP20/NEMA 2 Enclosure in Aluminum	FDK:083F5032	177.50
Polyamide Terminal Box with Lid for Field-Mount MAGFLO Sensors	FDK:085U1052	216.25
Connection Plate for 19" Rack Mount	FDK:083F4117	161.25
Brass Adapters, PG13.5 Male to 1/2" NPTF	FDK:A6X30005543	18.36

Description	Catalog Number	Price
<b>Interconnect Cables (Price per foot, two lengths required per installation)</b>		
Standard Interconnect Cable	FDK:001STCAB **	\$2.04
Special Interconnect Cable (for Empty Pipe)	FDK:001SPCAB **	3.06
** Choose two standard or one standard and one special cables. Both are PVC jacket, three-conductor plus overall braided shield.		
<b>Plug-In Communications Modules for Mag 6000 Electronics</b>		
Mag6000 HART Communication Module	FDK:085U0226	217.50
Mag 6000i HART Communication Module	FDK:085U0321	221.25
Mag 6000 Modbus RTU/RS485 Module	FDK:085U0234	217.50
<b>Spare Parts and Accessories</b>		
Mag 5000/Mag 6000 Sensorprom 2KB	FDK:085U1005	0.00
Mag 5000/Mag 6000 Display Unit	FDK:085U1039	166.25
Sun Shield for Remote-Mt Polyamide Covers	A5E01209496	223.75
Sun Shield for Integral Polyamide Covers	A5E01209550	360.00
<b>MAGFLO Verificator</b>		
MAGFLO Verificator (With Software and Adapter for IP67/Rack-Mount Models)	FDK:083F5061	18196.25

### Great for Drinking Water Applications

**Battery**  
**Powered!**

**Flow Sensor Body Mag 8000W (Drinking Water) 0.5% Accuracy, Battery-Powered Magmeter with Standard Mag5100W Sensor, Integral Transmitter, and Integral Battery Pack (2 D-Cells). Qmax=Volume Unit**



2" 277 GPM	7ME6810-2YJ31-2AA1	\$2955.00
2.5" 440 GPM	7ME6810-3FJ31-2AA1	2966.25
3" 704 GPM	7ME6810-3MJ31-2AA1	2978.75
4" 1100 GPM	7ME6810-3TJ31-2AA1	3028.75
5" 1761 GPM	7ME6810-4BJ31-2AA1	3237.50
6" 2769 GPM	7ME6810-4HJ31-2AA1	3427.50
8" 4389 GPM	7ME6810-4PJ31-2AA1	3750.00
10" 7044 GPM	7ME6810-4VJ31-2AA1	4235.00
12" 11007 GPM	7ME6810-5DJ31-2AA1	5410.00



**Popular models in 1" to 12" sizes usually available to ship within two weeks!**

**Sensors for General Industrial Applications**

**Flow Sensor Body Mag3100: Neoprene Liner, 316SS Electrodes, ANSI Class 150 Carbon Steel Flanges, Carbon Steel Housing**



1"	7ME6310-2DJ11-1AA2	\$1425.00
1.5"	7ME6310-2RJ11-1AA2	1443.64
2"	7ME6310-2YJ11-1AA2	1490.00
2.5"	7ME6310-3FJ11-1AA2	1512.50
3"	7ME6310-3MJ11-1AA2	1532.50
4"	7ME6310-3TJ11-1AA2	1600.00
6"	7ME6310-4HJ11-1AA2	2175.00
8"	7ME6310-4PJ11-1AA2	2713.78
10"	7ME6310-4VJ11-1AA2	3355.00
12"	7ME6310-5DJ11-1AA2	4728.75

**Flow Sensor Body Mag3100P: PTFE Liner, Hastelloy C-276 Electrodes, ANSI Class 150 Carbon Steel Flanges, Carbon Steel Housing**



0.5"	7ME6340-1VJ13-2AA2	\$1717.50
1"	7ME6340-2DJ13-2AA2	1551.25
1.5"	7ME6340-2RJ13-2AA2	1582.50
2"	7ME6340-2YJ13-2AA2	1605.00
2.5"	7ME6340-3FJ13-2AA2	1628.75
3"	7ME6340-3MJ13-2AA2	1656.25
4"	7ME6340-3TJ13-2AA2	1745.00
6"	7ME6340-4HJ13-2AA2	2546.25
8"	7ME6340-4PJ13-2AA2	3750.00
10"	7ME6340-4VJ13-2AA2	5106.25
12"	7ME6340-5DJ13-2AA2	7091.25

**Sensors for Food, Beverage, and Pharmaceutical Use**

**Flow Sensor Body Mag1100: PFA Liner, Hastelloy-C Electrodes, Includes EPDM Gaskets, SS Studs and Nuts**



3/8" DN10	7ME6110-1RA10-1AA2	\$1483.75
1/2" DN15	7ME6110-1VA10-1AA2	1483.75
1" DN25	7ME6110-2DA10-1AA2	1483.75
1.5" DN40	7ME6110-2RA10-1AA2	1757.50
2" DN50	7ME6110-2YA10-1AA2	2031.25
2.5" DN65	7ME6110-3FA10-1AA2	2156.25
3" DN80	7ME6110-3MA10-1AA2	2287.50
4" DN100	7ME6110-3TA10-1AA2	2811.25

**Flow Sensor Body Mag1100: Ceramic Liner, Platinum Electrodes, EPDM Gaskets, SS Studs and Nuts**

0.078" DN2	7ME6110-1DA20-2AA2	\$1545.00
1/8" DN3	7ME6110-1HA20-2AA2	1545.00
1/4" DN6	7ME6110-1MA20-2AA2	1350.00
3/8" DN10	7ME6110-1RA20-2AA2	1350.00
1/2" DN15	7ME6110-1VA20-2AA2	1350.00
1" DN25	7ME6110-2DA20-2AA2	1350.00
1.5" DN40	7ME6110-2RA20-2AA2	1618.75
2" DN50	7ME6110-2YA20-2AA2	1890.00
2.5" DN65	7ME6110-3FA20-2AA2	2022.50
3" DN80	7ME6110-3MA20-2AA2	2157.50
4" DN100	7ME6110-3TA20-2AA2	2732.50

**Flow Sensor Body Mag1100 Food: PFA Liner, Hastelloy-C Electrodes. Select Tri-Clover® or Tri-Clamp® Sanitary Adapter Below**



3/8" DN10	7ME6140-1RA10-1AA2	\$1483.75
1/2" DN15	7ME6140-1VA10-1AA2	1483.75
1" DN25	7ME6140-2DA10-1AA2	1483.75
1.5" DN40	7ME6140-2RA10-1AA2	1757.50
2" DN50	7ME6140-2YA10-1AA2	2031.25
2.5" DN65	7ME6140-3FA10-1AA2	2156.25
3" DN80	7ME6140-3MA10-1AA2	2282.50
4" DN100	7ME6140-3TA10-1AA2	2705.00

**Tri-Clover® Sanitary Weld-In Adapter: Includes 2 Clamp Fittings, 2 Clamps, and 2 EPDM Gaskets**

3/8" (1/2" Tri-Clover)	FDK:083G2276	\$240.00
1/2" (3/4" Tri-Clover)	FDK:083G2277	240.00
1"	FDK:083G2279	288.75
1.5"	FDK:083G2281	336.25
2"	FDK:083G2282	361.25
2.5"	FDK:083G2283	403.75
3"	FDK:083G2284	488.75
4"	FDK:083G2285	571.25

**For Water and Wastewater Applications**

**Flow Sensor Body Mag 5100W: Nitrile Rubber Liner, Hastelloy C Electrodes, ANSI Class 150 Carbon Steel Flanges**



1"	7ME6580-2DJ14-2AA2	1,070.00
1.5"	7ME6580-2RJ14-2AA2	1,083.75
2"	7ME6580-2YJ14-2AA2	1,118.75
2.5"	7ME6580-3FJ14-2AA2	1,131.25
3"	7ME6580-3MJ14-2AA2	1,143.75
4"	7ME6580-3TJ14-2AA2	1,192.50
5"	7ME6580-4BJ14-2AA2	1,401.25
6"	7ME6580-4PJ14-2AA2	1,591.25
8"	7ME6580-4VJ14-2AA2	1,913.75
10"	7ME6580-4VJ14-2AA2	2,398.75
12"	7ME6580-5DJ14-2AA2	3,573.75
14"	7ME6580-5KJ14-2AA2	4,952.50
16"	7ME6580-5RJ14-2AA2	5,541.25
18"	7ME6580-5YJ14-2AA2	6,158.75
20"	7ME6580-6FJ14-2AA2	6,840.00
24"	7ME6580-6PJ14-2AA2	7,602.50



**Ideal for Applications with High Concentration of Suspended Solids (Pulp and Paper, Cement, Mining)**

**TransMag2 Electronics: Patented Pulsed AC Magnetic Flowmeter for High Suspended Solids. IP67/ NEMA 4X Enclosure, Max. Measuring Error 0.50% Rate, 100-230 VAC Power; 1 Current, 1 Digital, 1 Relay (or 1 DI) Outputs**

4-20 mA with HART Protocol	7ME5034-0AA11-2AA0	\$2203.75
Profibus PA Protocol	7ME5034-1AA11-1AA0	2768.75
Mounting Bracket (Add Suffix to Model Number)	-A02	96.25

**Flow Sensor Body 911/E for TransMag 2: PTFE Liner, Hastelloy C4 Electrode, Remote Design, 1/2" NPT Screwed Gland, IP67/NEMA 5 Protection, ANSI Flanges**



1"	7ME5610-2DJ13-2AA2	\$2730.00
1.5"	7ME5610-2RJ13-2AA2	2845.00
2"	7ME5610-2YJ13-2AA2	3067.50
2.5"	7ME5610-3FJ13-2AA2	3443.75
3"	7ME5610-3MJ13-2AA2	3563.75
4"	7ME5610-3JJ13-2AA2	3847.50
5"	7ME5610-2BJ13-2AA2	4018.75
6"	7ME5610-4HJ13-2AA2	4268.75
8"	7ME5610-4PJ13-2AA2	5561.25
10"	7ME5610-4VJ13-2AA2	6650.00
12"	7ME5610-5DJ13-2AA2	8928.75
14"	7ME5610-5KJ13-2AA2	9015.00
16"	7ME5610-5RJ13-2AA2	10793.75

## SITRANS FC Coriolis Mass Flowmeters

### Mass 2100 Coriolis Mass Flow Sensor

- Accuracy >0.1% mass flow rate
- Dynamic turndown ratio >500:1, from 65 kg/h to a few g/h
- Densitometer performance available (Accuracy >0.001 g/cm<sup>3</sup>, repeatability >0.0002 g/cm<sup>3</sup>)
- Single continuous tube design, with no internal welds, reductions or flow splitters offers optimal hygiene, safety
- Market's biggest wall thickness ensures optimal corrosion resistance and high-pressure durability
- Intrinsically safe Ex ia standard



MASS 2100 coriolis mass flow sensor is designed for low flow measurement in liquids and gases. One unit measures mass flow, volume flow, density, temperature and fraction. MASS 2100 can be connected to MASS 6000 transmitters for remote installation only.

#### Specifications

**Pipe:** Inside Diameter: 1.5 mm (0.06"); Wall Thickness: 0.25 mm (0.010")

**Measuring Range:** Mass Flow: 0–143 lb/h; Density: 0–0.10 lb/in<sup>3</sup>; Fraction: 0–100° Brix; Temperature: -58° to 257° F (Optional 356° F);

**Liquid Pressure Measuring Pipe:** Stainless steel: 3336 psi at 68° F; Hastelloy C22/2.4602: 5294 psi at 68° F

**Construction:** Measuring pipe/connection: 316L stainless steel; Hastelloy C22/2.4602; Enclosure: IP65 316L stainless steel

**Connection:** 1/4" NPTM ANSI/ASME B1.20.1

**Approval:** Ex ia IIC T3-T6, DEMKO 03 ATEX 135252X

### Mass 6000 Mass Flow Transmitter

- For mass flow rate, volume flow rate, density, temperature, fraction flow (e.g., Brix)
- One current output, one frequency/pulse output, one relay output, one digital input; All outputs can be individually configured with mass, volume, or density
- Adjustable flow direction, with single and bidirectional flow measurement
- Limit switches with one or two limits, programmable for flow, density or temperature
- Full batch controller
- Two built-in totalizers count positive, negative or net
- Noise filter for performance in tough environments
- Auto zero adjustment with zero point evaluation feedback
- Full service menu for effective use and troubleshooting
- Compatible with MASS 2100, FC300 and other flow sensors



### FC300 Coriolis Mass Flow Sensor

- Accuracy >0.1% mass flow rate
- Dynamic turndown ratio >500:1
- One tube with no internal welds, reductions, or flow splitters
- Balanced pipe design ensures optimal stability under harsh and unstable process conditions
- Four-wire Pt1000 temperature measurement for accurate mass flow, density and fractional flow
- Intrinsically safe Ex ia IIC standard



SITRANS FC300 sensor offers superior performance in flow and density accuracy, and turndown ratio. The compact enclosure fits in tight installation spaces for measuring liquids and gases. It can be installed in horizontal or vertical position. FC300 can be connected to MASS 6000 transmitters for remote installation only.

#### Specifications

**Sensor Size:** DN 4 (1/6")

**Mass Flow:** Range: 0–772 lb/h; Accuracy: 0.1 % of rate; Repeatability: 0.05 of rate; Max. Zero Point Error: 0.022 lb/h

**Density:** Range: 0–0.105 lb/in<sup>3</sup>; Density Error: 0.00025 lb/in<sup>3</sup>; Repeatability

**Temperature:** -40° to 239° F (Optional to 356° F); Temperature Error: 0.9° F

**Brix:** 0–100°; Error: 0.3° Brix

**Pipe:** Inside diameter: 0.14"; Wall thickness: 0.0098"; Liquid pressure measuring pipe: 1885 psi at 68° F

**Construction:** 316L stainless steel; Measuring pipe/connection: Hastelloy C22/2.4602; Enclosure: IP67/NEMA4 316L stainless steel

**Connection:** 1/4" NPTM, ANSI/ASME B1.20.1

**Approval:** UL Class 1 Div. 1, Groups A–D, ATEX

#### Specifications

**Current Output:** 0/4–20 mA;

Load: < 800 Ω; Time constant: 0–99.9s adjustable

**Digital Output:** Frequency: 0–10 kHz, 50 % duty cycle; Time constant: 0–99.9s adjustable; Active: 24 VDC, 30 mA; Passive: 3–30 VDC, max. 110 mA

**Change-Over Relay:** Load: 42V/2 A peak; Functions: Error level, error number, limit, flow direction

**Digital Input:** 11–30VDC; Start/hold/continue batch, zero point adjust, reset totalizer 1/2, force output, freeze output

**Cut-Off:** Low-flow 0–9.9% max flow; adjustable density or empty pipe cutoff

**Limit Function:** Mass flow, volume flow, fraction, density, sensor temperature

**Totalizer:** Two eight-digit counters for forward, net or reverse flow

**Display:** Backlit alphanumeric text, 3 x 20 characters for flow rate, totalized values, settings and faults. Reverse flow indicated by negative sign

**Zero Point Adjustment:** Via keypad or remote via digital input

**Communication:** Add-on modules: HART®, PROFIBUS PA and DP, MODBUS RTU RS-485, DeviceNet, FOUNDATION Fieldbus H1

**Enclosure:** Rating IP67/NEMA 6 Fiberglass reinforced polyamide;

**Supply Voltage:** 24 VDC/AC, 50–60 Hz

**NAMUR:** Within the value limits according to "General requirements" with error criteria A in accordance with NE 21

**Cable Glands:** Two 1/2" NPT or M20 polyamide cable glands

## SITRANS FC430 Coriolis Mass Flowmeter

- Compact design: Install anywhere, fit multiple units into tight spaces; Sizes available from 1.2" to 3"
- Flange, pipe thread, hygienic thread and hygienic clamp connections available
- HemiShape flow manifold for low pressure loss; Avoids cavitation and separation of fragile fluids; Ideal for hygienic use (EHEDG/3A approved)
- 4-20 mA analog output with HART® 7.2 standard. Other I/O can be configured for analog, pulse, frequency, relay, or status
- FCT030 transmitter available in remote and compact versions, mountable on all FCS400 sensor sizes DN15 to DN80
- Fully rotatable (0-180°) pedestal makes access possible from all sides, includes simple one-bolt release clamp



- Can be validated and configured for SIL2 or SIL3 operation
- Meets all IEC Ex, ATEX, and FM hazardous area requirements
- Standard Siemens local user interface (LUI): Reduces training needs for added cost and time-efficiency. Full graphical display, straight-forward commissioning, simple navigation, customized top-level views, standard programming wizards provide guidance for the inexperienced user
- Superior isolation and resistance against external vibrations for 0.1% accuracy, 0.05% repeatability, and no twisting
- MicroSD card stores user and factory settings, calibration data and certificates. For audit trails and quick transfer of information to PC or between transmitters
- Remote FCS400 model's digital sensor link guarantees high-speed data transfer, even with up to 200 meters between sensor and transmitter



### Streamlined, compact SITRANS FCS400 sensor

The SITRANS FCS400 coriolis mass flow sensor was designed for superior performance and reliability: a very stable zero point, low pressure loss, and high immunity to process noise and plant vibrations.

FCS400 is the most compact sensor available in today's mass flowmeter market. The small size makes installation and replacement easy, and possible to fit multiple units into tight spaces.

The Siemens CompactCurve tube shape offers a 0.1% flow rate accuracy and high sensitivity for optimal measurement, even with very low flows. The unit is self-draining and highly resistant to pressure burst. The ultra-short tube provides better than 1 kg/m<sup>3</sup> density accuracy.

HemiShape flow manifold design ensures balanced flow between tubes and makes the FC430 great for use in fragile liquids. It includes purge connectors for monitoring, safety relief valves, and rupture discs. The unique design secures low pressure loss and avoids cavitation at the separation of fragile liquids — ideal in hygienic applications. Its smooth surface allows for easy cleaning with minimal flow abstraction.

Models can be ordered for standard, hygienic, or NAMUR service, and can be validated and configured for SIL2 or SIL3 operation standard. (SIL3 requires two flowmeters in series, monitored by a SIL-rated control system).

### SITRANS FCS400 Sensor Specifications

**Sizes:** DN15 (1/2") DN25 (1") DN50 (2") DN80 (3")

**Flow Range (Lb/h):** 8,157 25,353 114,640 300,000

**Accuracy:** ±0.10%; **Repeatability:** ±0.05%

**Pressure rating:** Measuring tube: 1450 PSI; Sensor enclosure: 20 bar for 1/2" and 1" models, 17 bar for 2" and 3" models

**Temperature:** Process: -58° to 392° F; Ambient: -40° to 140° F

**Material:** Wetted parts: 316L SS; Enclosure: IP67-rated 304 SS

**Process connections:** Flanges: EN1092-1 B1 and D, ANSI/ASME B16.5, JIS; Pipe threads: ASME (NPT), BSPP, VCO Quick-Connect; Hygienic threads: DIN11851, DIN11864-1, ISO2853, SMS1145; Hygienic clamps: DIN11864-2, DIN32676, ISO2853, SMS1145

**Approvals:** Hazardous area: ATEX, IECEx, FM, NEPSI, CSA, TISS, GOST; Pressure equipment: PED, CRN; Hygienic: 3A, EHEDG; Custody transfer: SITRANS FC430 OIML R 117; Operational safety: SIL2

### One SITRANS FC coriolis mass flowmeter can measure:

Mass Flow Rate	Temperature	Total Volume
Total Mass	Brix	Fraction Flow
Density	Volumetric Flow Rate	% or Total Fraction

### Innovative and user-friendly SITRANS FCT030 transmitter

Based on patented digital signal processing technology, the SITRANS FCT030 transmitter delivers true multi-parameter measurements with enhanced efficiency, security and simplicity. Fully modular for installation and replacement; can be remote or compact mounted with all SITRANS FCS400 sensor sizes.

Fully graphical interface display can be customized to show you different information during measurement and diagnostics. Measurement views include multivariable numeric display, bar graphs, and trend curves. On-screen diagnostics include timestamp and NAMUR results.

Four navigational buttons, help text, and wizards for processes make servicing the transmitter easy. The common Siemens menu structure, display layout, and input methods reduces the need for user training.

The SensorFlash MicroSD card serves as a removable database of operational user information and provides direct access to all relevant certificates and audit trails.

### SITRANS FCT030 Transmitter Specifications

**Input/Output Channels:** Up to 4 channels combining analog, relay or digital outputs and binary input

**Signal Processing:** 100 Hz

**Communication:** HART 7.2

**Power supply:** 24-90 VDC, 100-240 VAC

**EMC performance:** EN 61326-3-2

**Local User Interface (LUI):** Full graphical display, 240 x 160 pixels

**Construction:** IP67-rated aluminum with corrosion-resistant coating







**Mechanical load:** 18 to 1000 Hz random, 3.17 G rms, in all directions

**Approvals:** Hazardous areas: ATEX, IECEx, FM, NEPSI, CSA, TISS, GOST; Hygienic: 3A; NAMUR; Custody transfer: SITRANS FC430 OIML R 117; Operational safety: SIL3 (transmitter and redundant system)



## SITRANS F US Clamp-On Ultrasonic Flowmeters

## Comparing SITRANS F US Clamp-On Flowmeter Configurations

Model						
Replaces...	Controlotron 1020	Controlotron 1010N, 1010X, 1010WX	Controlotron 1010P, 1010WP	Controlotron 1010EN, 1010EP	Controlotron 1010DV, 1010V, 1010B	Controlotron 1010GC
Flow Range	±40 ft/sec (±12 m/s) bidirectional					
Flow Sensitivity	0.001 ft/sec (0.0003 m/sec) flow rate independent	0.001 ft/sec (0.0003 m/sec) flow			0.001 ft/sec (0.003 m/sec) flow rate independent	
Pipe Sizes	0.25" to 360" (DN 6.4 to DN 9140)					1" to 60" (DN 25 to DN 152)
Optional Inputs	None	Two 4–20 mA DC, Two 0–10 VDC, Two 4-Wire 1kΩ RTD		Two 4–20 mA DC, Two 0–10 VDC, Two 4-Wire 1000Ω RTD, Totalizer commands (clear/hold)	Four 4–20 mA user selectable, Two 4-Wire 1000Ω RTD	Two 4–20 mA, Two 4-Wire 1000Ω RTD
Outputs	4–20 mA DC 1x for single channel 1x 0–5 kHz pulse rate, digital isolated RS232	Two 4–20 mA DC (1kΩ at 30 VDC), Two 0–10 VDC (5kΩ min.), Four SPDT relays for status alarms, Two 0–5 kHz frequency, RS232			Two 4–20 mA DC (1kΩ at 30 VDC), Two 0–10 VDC (5kΩ min.), Four 0–5 kHz pulse rate (None for NEMA 7/IP65 version), RS232	Two 4–20 mA DC programmable standard, Two 0–10 VDC, Four 0–5 kHz, RS232
Accuracy	1–2% actual volume reading (Higher accuracy is dependent on pipe condition)	±0.5–1.0% flow for velocities >1 ft/sec (0.3 m/sec) ±0.005–0.01 ft/sec (±0.0015–0.003 m/sec) for velocities <1 ft/sec (0.3 m/sec)	±0.5–2.0% flow for velocities >1 ft/sec (0.3 m/sec) ±0.005–0.01 ft/sec (±0.0015–0.003 m/sec) for velocities <1 ft/sec (0.3 m/sec)	±0.5–1.0% flow for velocities >1 ft/sec (0.3 m/sec) ±0.005–0.01 ft/sec (±0.0015–0.003 m/sec) for velocities <1 ft/sec (0.3 m/sec)	0.5–1.0% flow, calibratable to 0.15–0.3% of flow, 0.05 of API number (interface detector)	Out of box 1–2%, calibratable to 0.5% ±0.005–0.01 ft/sec (±0.0015–0.003 m/sec) for velocities <1 ft/sec (0.3 m/sec)
Batch Repeatability	±0.15–1.0% flow 0.05–0.1% actual volume reading for 5–100 ft/sec (1.5–30 m/sec) velocities, pipe condition dependent	±0.15% flow for velocities >1 ft/sec (0.3 m/sec) ±0.0015 ft/sec (0.0005 m/sec) for velocities <1 ft/sec (0.3 m/sec)			0.05% (depending on model) ±0.10–0.2% flow for velocities >1 ft/sec (0.3 m/sec)	±0.15% flow for velocities >1 ft/sec (0.3 m/sec) ±0.0015 ft/sec (0.0005 m/sec) for velocities <1 ft/sec (0.3 m/sec)
Data Refresh	5 Hz				5 Hz (80 Hz output optional)	
Enclosure Ratings	NEMA 4/IP65	NEMA 4X/IP65, NEMA 7/IP65, NEMA 7/IP66	IP67	NEMA 4X/IP65, NEMA 1/IP40	NEMA 4X/IP65, NEMA 7/IP65, NEMA 7/IP66	
Liquid Temperatures	-40° to 250° (-40° to 120° C) standard; -40° to 450° F (-40° to 230° C) optional					-40° to 140° F (-40° to 60° C) Call for higher temps.
Power Supply	90–240 VAC, 50/60 Hz 30 VA or 9–36 VDC, 12W		100–240 VAC, 50/60 Hz, 30 VA, 9–36 VDC, 12W	90–240 VAC, 50/60 Hz, 30 VA, 9–36 VDC, 12W 100–240 VAC, 50/60 Hz, 9–36 VDC, 10W Internal NiCad battery (4 hour)	90–240 VAC, 50/60 Hz, 30 VA, 9–36 VDC, 12W 90–240 VAC, 50/60 Hz, 15 VA or 9–36 VDC, 10W	
Approvals	UL, ULc, CE	FM, CSA, ATEX, CCOE, INMETRO, GoST	UL, ULc, CE	FM, CSA, CE (fixed) UL, ULc, CE (portable)	FM, CSA, ATEX, INMETRO, GoST	
Prices Start at	\$2005.00	\$3781.12	\$5034.24	\$4604.00	\$7446.00	\$8961.00

# SIEMENS



**Flowmeter configuration... there's an App for that!**



**Don't guess how much money's flowing through your pipe. Clamp-on and know!**

- Measure practically any liquid and gas
- Performance unaffected by viscosity, flow rate, pipe size, solids and aeration content
- High accuracy and repeatability through automatic temperature compensation and zero drift correction
- Install on pipe sizes up to DN9140 (360")

With no moving parts to wear or foul, no need to cut the pipe for installation, and high accuracy WideBeam ultrasonic flow measurement technology, you have nothing to lose.

Siemens' clamp-on ultrasonic flow technology offers several advantages over other flow measurement methods. Transducers mount quickly and easily on the outside of the pipe, so they're ideal for retrofit applications or anywhere corrosive, toxic or high pressure liquids and gases rule out the option of cutting the pipe.

### The Transducer is Key

Transducers for Siemens ultrasonic clamp-on flowmeters are available with Doppler and WideBeam transit time measurement technologies, so there's a solution to work in practically any installation.

Doppler operation is suggested for liquids with extensive suspended solids or aeration, and offers up to 2% flow accuracy. WideBeam transit time operation is the preferred mode for relatively homogeneous liquids. Accuracy is up to 0.5% of the flow.

The patented WideBeam technology increases measurement precision by reducing the sensitivity to any change in the medium type or physical properties. The signal-to-noise ratio is optimized by using the resonant frequency of the pipe wall to transmit the sound signal into the media, with the wall acting as a waveguide. This method produces a focused, coherent signal that makes the technology particularly valuable for hydrocarbon and gas applications.

For added flexibility, flowmeters are available that allow switching between Doppler and WideBeam to quickly adapt to varying conditions without changing meters.



*Engineering specifications and more available online.*

Since the accuracy of a clamp-on ultrasonic flowmeter depends on choosing the right transducer, this is a crucial step in the meter configuration. Siemens offers four types of transducers: universal, universal high temperature, high precision and Doppler. Before deciding on the most appropriate transducer, consider these factors: pipe thickness, diameter and material, liquid/gas type, and amount of aeration.

By evaluating all of these aspects before choosing your final configuration, you are sure that your meter will work exactly the way you want it, right from day one. With flexible configuration options combined with permanent and portable versions, finding exactly what you need has become a lot easier.

Customize your flowmeter by choosing necessary transducers, number of channels and enclosures, or select a complete pre-configured system available for HVAC, power, and hydrocarbon industries.

As a crucial accessory, the clamp-on program also includes an easy-to-use, stand-alone digital ultrasonic pipe wall thickness gauge. Since even the smallest pipe thickness miscalculations can have an impact on accuracy, this high precision gauge is an indispensable flow measurement tool.



### SITRANS FUS1010: Versatility and Flexibility

Ultrasonic flowmeters can be used within a wide variety of applications and industries, so they're quickly becoming the metering technology of choice. The versatile SITRANS FUS1010 illustrates this perfectly.

It offers numerous advantages in application adaptability that cannot be matched by any other single flow measurement technology: zero pressure drop, insensitivity to outside noise, high turn-down ratio, interface software, and WideBeam and Doppler modes.



The SITRANS FUS1010 is available in single, dual channel/beam, and four channel configurations plus your choice of three enclosures: NEMA 4X/IP65 wall mount, NEMA 7/IP65 compact, and NEMA 7/IP66 wall mount.

To accommodate more basic applications, the low cost SITRANS FTS020 comes with WideBeam and as single and dual channel versions, allowing either one or two measurement points.



### SITRANS FUP1010 Portable Flowmeter for Check Metering and Survey Applications

For applications that don't need constant flow monitoring or pipes where operators need to check the flow against a known or expected value, Siemens offers portable clamp-on ultrasonic flowmeters.

The SITRANS FUP1010 is available with a waterproof IP67 enclosure that makes it ideal for outdoor use. The rugged, impact resistant plastic case simply enables it to withstand rough treatment that would damage most other meters.

SITRANS FUP1010 operates on AC or DC power. It has an internal battery that provides 4 hours of operation and can be recharged in 1.5 hours.

## SITRANS F US Clamp-On Ultrasonic Flowmeters



# SIEMENS

With the dual channel version, switching between WideBeam and Doppler operation for quick adaptation to varying conditions can take place without changing meters. This makes it suitable for any liquid; even those with high aeration or suspended solids. Using the meter's internal datalogger, process history can be recorded and stored or downloaded to a PC or laptop.

### Check Metering Kits

If you need a portable meter that needs to be moved often as part of a flow survey or flow check measurement, pre-configured check metering kits are the ideal solution. They can be used for checking the performance and accuracy of any type and brand of flow or energy meter.



Kits come in rugged, weatherproof rolling cases with telescoping handles. The case holds all the equipment — cables, multiple transducers and the ultrasonic flow computer; no need to order extra parts.

Clamp-on ultrasonic check metering kits are available for water and wastewater, oil and gas, and energy industry applications.

### Water and Wastewater Application Solutions

Ultrasonic WideBeam transit time and Doppler flowmeters are engineered to measure a wide range of flow applications found in the municipal water and wastewater industries.

They can be mounted on any pipe size and material, and range from simple single meter installations to full flow metering or leak detection systems in large distribution and collections systems plants.

Single, dual or four channel configurations facilitate the installation on a very wide range of applications. Dual channel meters can be set up on two separate applications and can also provide math functions between the two channels. The same applies for the four channel meter, which can monitor four lines and also has math and multipath functions.

### SITRANS FUH1010 for Hydrocarbon Industry Applications

Siemens SITRANS FUH1010 meters are specifically designed to address the needs of the hydrocarbon industry in applications where traditional meters cannot perform.

- Continuous operation with highly aerated liquids
- Flow measurement under a wide range of viscosities
- Easy and quick installation with zero process down time
- High performance under less than ideal flow profile conditions

SITRANS FUH1010 flowmeters are ideal for crude oil, refined petroleum or liquefied gas applications. They are available in single, dual, three or four beam versions and use WideBeam technology for maximum accuracy.

Clamp-on flowmeters for the hydrocarbon industry are available in three different versions. The temperature- and pressure-compensated SITRANS FUH1010 interface detector offers extremely precise interface, crude oil and multiproduct identification. It is ideal for scraper "pig" and density indication. The system provides outputs for API number, density,

and specific gravity at base temperature and pressure at both reference and current operating conditions.

The SITRANS FUH1010 for accurate standard volume/mass flow measurement is required for high end application such as varying viscosity liquids and multi-product pipelines. It's also ideal for line balance applications that require normalized volume or mass output.

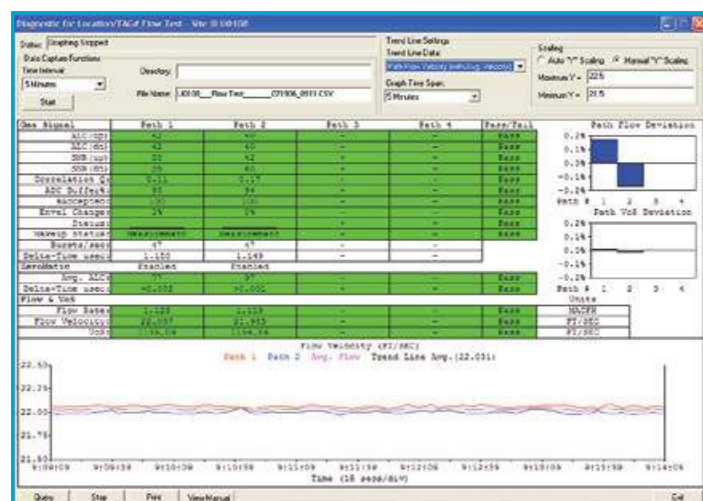
Outputs are available for density and API. For even more precise density compensation, analog inputs from densitometers, temperature sensors, viscometers and pressure transmitters can be used.

### SITRANS FUE1010 for Energy and Power Applications

The rugged, high precision SITRANS FUE1010 flowmeter is ideally suited for thermal energy and power applications, and large pipe sizes.

Key applications include high precision revenue grade sub-metering of thermal energy production, chilled or hot water HVAC installations, measurement of ammonia and glycol mixtures, and energy efficiency monitoring of HVAC equipment and nuclear power plants.

As a stand-alone energy meter, the FUE1010 can be used as a remote communication module. Inputs from other data sources are transferred into the built-in data logger, making it easy to time-stamp all data and download it for billing, efficiency and operation analysis.



### Flowmeter Software for Diagnostics and Data Analysis

Easy to use DataView software provides diagnostic capabilities, data logging and trending of meter performance. This diagnostic assures calibration and operational integrity. AGA-10 speed of sound calculation is incorporated in the software for speed of sound verification.

An internal AGA-8 table for fixed gas composition is available for standard volume computation. Single, dual, or optional four beam versions are available along with rugged, stainless steel transducer enclosures permit permanent and direct burial installations.



## Quick Configurations for Popular Models



FUS1010 standard clamp-on flowmeter, NEMA 4/IP65 enclosure. Includes two 0-10 VDC, two 4-20 mA and two 0-5 kHz pulse outputs and four Form C relay outputs, 90-240VAC power, RS232 Modbus RTU communications.



FST020 basic clamp-on flowmeter, NEMA 4/IP65. Includes one 4-20 mA output per channel and 1 pulse output (single channel model only.) Transducer includes pipe mounting kit. Unit is UL, cUL, and CE approved standard.

### Model Selection Guide

Description		Catalog Number	Price
FUS1010 Standard Clamp-On Flowmeter		7ME3530-	\$3781.12
Channels/Beams	Single Channel	1AA00-	0.00
	Dual Channel/Dual Beam	2AA00-	929.28
Channel 1 Transducer	No Sensor	0A__	0.00
	C3 Universal, 13" Mounting Frame	0D__	1588.48
	D3 Universal, 24" Mounting Frame	0E__	1588.48
	D1H High Precision 48" Mounting Frame	0P__	2104.32
	D2H High Precision 48" Mounting Frame Doppler Strap Kit up to 12"	0Q__	2298.88
		0S__	884.48
Channel 2 Transducer	No Transducer	__A1	0.00
	D1H High Precision 48" Mounting Frame	__P1	2104.32
	Doppler Strap Kit up to 12"	__S1	884.48
ID Tag	Stainless Steel, Max 68 Characters	,Z-Y19	90.00
Sensor Cable	1 x PVC-Jacket, 20'	,Z-K01	106.24
	1 x PVC-Jacket, 50'	,Z-K02	117.76
	1 x PVC-Jacket, 100'	,Z-K03	208.64
	1 x PVC-Jacket, 150'	,Z-K04	346.88
	1 x PVC-Jacket, 200'	,Z-K05	391.68



FUP1010 portable clamp-on flowmeter, IP67 weatherproof, battery powered. Includes RTD mounting hardware and cable, pipe mounting kit and spacer bars for each transducer. Call for high temperature transducers.

### Model Selection Guide

Description		Catalog Number	Price
FUP1010 Portable Clamp-On Flowmeter		7ME3510-	\$5034.24
Channels/Beams	Single Channel	10C___-	0.00
	Dual Channel/Dual Beam	20C___-	1012.48
Sensor Cable	No Sensor Cable	___A0_-	0.00
	1 x PVC-Jacket, 20'	___B0_-	136.96
	2 x PVC-Jacket, 20'	___C0_-	273.92
	1 x PVC-Jacket, 50'	___D0_-	180.48
	2 x PVC-Jacket, 50'	___E0_-	362.24
Battery Charger	None	___-0-	0.00
	Charger Type K for U.S. (NEMA 5-15P)	___-5-	744.96
Channel 1 Transducer	No Transducer	0AA0	0.00
	A2 Universal, 3" Track Mount	0BA0	1556.48
	B3 Universal, 5" Track Mount	0CA0	1556.48
	C3 Universal, 13" Mounting Frame	0DA0	1928.96
ID Tag	Stainless Steel, Max 68 Characters	,Z-Y19	90.88

**Siemens portable clamp-on ultrasonic flowmeters are available for rent for survey metering applications. Call for details.**

### Model Selection Guide

Description		Catalog Number	Price
FST020 Basic Clamp-On Flowmeter, NEMA 4/IP65		7ME3570-	\$2005.00
Channels	Single Channel	1H___-	0.00
Meter Power	100-240 VAC	__A00-	0.00
	11.5-28.5 VDC	__B00-	0.00
Channel 1 Transducer	No Transducer	0A__	0.00
	B3 Universal, 5" Track Mount	0C__	1423.75
	C3 Universal, 13" Mounting Frame	0D__	1551.25
	D3 Universal, 24" Mounting Frame	0E__	1551.25
	B2H High Precision, 5" Track Mount	0L__	1602.50
Sensor Cables	No Cables	__A0	0.00
	1 x PVC-Jacket, 20'	__B0	103.75
	1 x PVC-Jacket, 50'	__C0	115.00
ID Tag	Stainless Steel, Max 68 Characters	,Z-Y19	90.88

## Program your flowmeter with an iPhone or iPad



SITRANS CONNECTION App for Apple iOS devices enables direct serial communication between an iPhone, iPad, or iPod touch and any SITRANS F US clamp-on ultrasonic flow meter to enhance all meter functions, like programming, operational review, and data logging and download.

SITRANS CONNECTION App makes connectivity possible without needing a laptop PC. It simplifies programming with a full alphanumeric keypad for easier navigation and parameter entry. Plus, it lets you share access to your terminal window with a qualified service technician (Wi-Fi or cellular service required).

### How to Order

You can order the SITRANS CONNECTION iOS app through the Apple iTunes store or from Siemens. When you order the software from Siemens, you'll receive an iTunes redemption code. At that point, you can download the app from the iTunes store.



You will need to purchase a Siemens cable kit to connect your Apple device to the Siemens clamp-on ultrasonic flowmeter. Select the cable (or cables) you need based on your flowmeter model.

### Model Selection Guide

Description	Catalog No.	Price
SITRANS Connection App: iTunes Redemption Code	A5E32299678	\$15.00
Cable Kit-IP67 FUP Weather Proof Portable Meter	A5E32299677	236.64
Cable Kit-IP65 FUE, FUG, FUH, FUS Meter (No Ext I/O)	A5E32299675	179.52
Cable Kit-IP65 FUE, FUG, FUH, FUS Meter (with Ext I/O), IP40 FUE Portable, FUT, FST020	A5E32299674	136.68

Compare SITRANS F US flowmeter models on page 72.

# SITRANS LUT440 Open Channel Flow Monitor **SIEMENS**

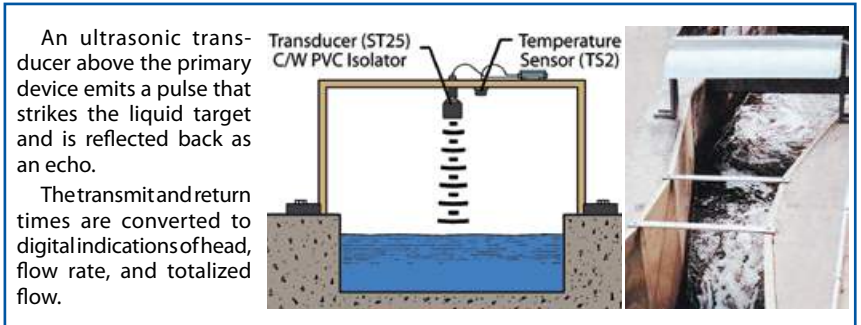


- Industry-leading accuracy to  $\pm 0.04''$  (1 mm)
- Next generation Sonic Intelligence — improved performance in noisy environments
- Echo profile and trend view on the display for enhanced diagnostics
- Energy-saving algorithms and real time clock help you reduce pump operation cost by avoiding peak energy periods
- HART® communications with access via panel interface, SIMATIC PDM, Emerson handhelds, and web-browser
- Graphical Quick Start Wizards guide you through setup
- Front interface with four-button programming, menu-driven parameters, and Wizard support
- Datalogger records performance and alarm events
- Wall, pipe, and DIN rail mounting configurations
- Removable terminal strips for hassle-free wiring



## A complete LUT440 system includes:

1. Controller
2. Echomax transducer
3. Additional cable lengths, as necessary
4. Optional sensor mounting flanges and aiming kits, as necessary



An ultrasonic transducer above the primary device emits a pulse that strikes the liquid target and is reflected back as an echo.

The transmit and return times are converted to digital indications of head, flow rate, and totalized flow.

## Specifications

**Range:** 1 to 200 ft, transducer and material dependent

**Accuracy:**  $\pm 1$  mm (0.04") plus 0.17% distance; *High accuracy:*  $\pm 0.04''$  (1 mm), within 10 feet (3 m) range

**Resolution:** Greater of 0.1% measured range or 0.08"

**Temperature:** *Ambient:* -4° to 122° F (-20° to 50° C); *Application:* -40° to 302° F (-40° to 150° C)

**Interface:** Back-lit LCD; Removable display, operational up to 5 m (16 ft) from enclosure base

**Communications:** HART®, USB

**Programming:** Four local push buttons, SIMATIC PDM Emerson AMSTM, web browser (Internet Explorer), Field Device Tool (DT), Emerson FC375/FC475

**Output:** Three relays: One Form C (SPDT) relay, two Form A (SPST) relays; One 4–20 mA output (active or passive)

**Input:** Two discrete inputs (0-50 VDC max switching level) with 24 VDC bias for contact level device and/or pump interlock; One temperature sensor input for optional TS-3 temperature sensor

**Enclosure:** Wall/Pipe/DIN Rail mount; 1/2 DIN; Type 4X/NEMA 4X/IP 65, panel mount display IP 54 (Type 3/NEMA 3/IP 54); Polycarbonate. *Use of the knock-out on the blind lid for the panel mount version reduces the electronics enclosure rating to IP 20/NEMA 1.*

**Power:** *AC version:* 100 to 230 VAC  $\pm 15\%$ , 50/60 Hz, 36 VA 10 W; *DC version:* 10 to 32 VDC 10W

**Approvals:** *General purpose:* CE, CSAUS/C, FM, UL Listed, C-TICK; *Hazardous location:* CSA Class I, II, III, Division 2 (Groups A–G), CE, ATEX 3D, IECEx, C-TICK

## Ordering Instructions

Select one option from each table section below. A complete catalog number looks like this:  
7ML5050-\_\_\_\_\_-\_\_\_\_\_-Z

## Model Selection Guides

Description		Catalog Number	Price
SITRANS LUT440 Ultrasonic Open Channel Flow Monitor		7ML5050-0C__	\$ 1896.40
Enclosure	With display	A__-	130.90
Display	With remote panel mount display	B__-	299.20
Options	No display (blank lid provided)	C__-	0.00
Input Voltage	100 to 230 VAC $\pm 15\%$	___1-	0.00
	10 to 32 VDC	___2-	0.00
Cable Inlet	3 cable inlets, cable glands not supplied	___1-	0.00
	3 cable inlets, 3 M20 cable glands supplied	___2-	15.40
Approvals	General purpose CE, FM, CSA US/C, UL, C-TICK	1DA0	0.00
	CSA Class I, II, III, Div 2 Groups A–G	1DC0	63.80
Optional Adders	Manufacturer's test certificate	-Z-C11	23.10
	Stainless steel tag: Max. 27 char plain text	-Z-Y15	16.50
	Preset Namur NE43 failsafe setting – $< 3.6$ mA	-Z-N07	41.80
Documentation	Printed English User Manual	7ML1998-5MV01	46.64
	Printed Quick-Start Guide	7ML1998-5XU81	41.34
	Printed Communications Manual	7ML1998-5NE01	29.68
Accessories	Tag, stainless steel, 0.47 x 1.77", one text line	7ML1930-1AC	46.64
	Panel Mount Cable Extension 2.5 m (8.2 ft)	7ML1930-1GF	54.06
	Cable Glands and Retaining Nuts (3-Pack)	7ML1930-1GB	18.02
	HART Modem, USB	7MF4997-1DB	591.10
	LUT400 Sunshield, 304 Stainless Steel	7ML1930-1GE	228.96

Level Measurement Instruments

Flow Measurement Instruments

Pressure Transmitter

Temperature Sensors and Transmitters

Wireless Sensing and Communications

Analytical Instruments and Systems