VERSAFLOW SONIC 1000 ULTRASONIC CLAMP-ON FLOWMETER

CLAMP-ON TECHNOLOGY

HONEYWELL'S VERSAFLOW SONIC 1000 ultrasonic flowmeter is based on transit time principle and stands for continuity and long term reliability. Flow measurement can be done anywhere and startup is immediate. The new VERSAFLOW clamp on flowmeter for liquids with its robust industrial construction and regreasing concept provides a revolutionary solution for easy handling.

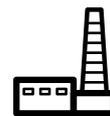*VersaFlow Ultrasonic clamp-on Flowmeter*

TWS9000 W

TWS9000 F

HIGHLIGHTS

- Minimised uncertainty
- Optimised reliability
- Minimal maintenance
- Efficient regreasing concept
- Easy sensor mounting
- Installation wizard
- X-mode dual path sensor option
- Advanced Diagnostics

APPLICATIONS

- Chemical addition
- General process control
- Cooling water circuits
- Broad range of refined hydrocarbons
- Potable water
- De-ionized and demineralized water
- Sanitary flow rate measurements
- Leak detection
- Acids and corossive chemicals
- Purified water
- Heat consumption/ energy measurement

INDUSTRIES

- Chemicals
- Petrochemical
- Power Plants
- Water
- Oil & Gas
- Semi-conductor
- Food & Beverage
- Pharmaceuticals

Honeywell

VERSAFLOW VARIANTS

The VERSAFLOW ultrasonic is a clamp-on flowmeter that can be fitted on the outside of piping to measure the flowrate of liquids. The flowmeter consists of a combination of one or two VERSAFLOW clamp-on sensor(s) and one TWS9000 ultrasonic flow converter.

VERSAFLOW CLAMP-ON SENSORS (SM10)

Small sensor, for pipe diamters DN15 to DN100/1/2" - 4"

Medium sensor, for pipe diameters DN50 to DN400/2" to 16" and in X-mode for pipes DN200 to DN1250/8" to 50"

Large sensor, for pipe diameters DN200 to DN4000/8" to 160"

TWS9000 ULTRASONIC FLOW CONVERTER (SM11/SM12)

Options

VERSAFLOW XT upto 200°C" and offshore for extended temperature

TWS9000 W:
Wall mounted, Polyamide-Polycarbonate housing, non-Ex, IP65

TWS9000 F:
Field version, die-cast aluminum, non-Ex and, IP66/67

TECHNICAL DATA

VERSAFLOW ULTRASONIC FLOWMETER

VERSIONS	
VERSAFLOW - Non-Ex	Standard
VERSAFLOW - Ex	Option

PERFORMANCE	
Measurement functionality	Standard actual volume flow rate and totalised volume, flow speed, flow direction, mass flow, speed of sound, signal to noise ratio, quality of signal.
Measuring range	0.1...20 m/s / 0.3...66 ft/s (turn down 200:1)
Max. deviation (under reference conditions]	<± 1% of M.V. for DN ≥ 50 mm / 2", v > 0.5 m/s / 1.64 ft/s
	<± 3% of M.V. for DN < 50 mm / 2", v > 0.5 m/s / 1.64 ft/s
Repeatability	<± 0.2%
Process Conditions	Liquid, single phase, clean.
Permissible gas content(volume)	≤ 2%
Permissible solid content(volume)	≤ 5%
Viscosity	<200cSt

MEASUREMENT CONFIGURATIONS	
Single path, single pipe or dual path/dual pipe	Standard

VERSAFLOW ULTRASONIC FLOW SENSOR

VERSIONS	
VERSAFLOW - small (DN15...DN100 / ½"...4")	Standard
VERSAFLOW - medium (DN50...DN400 / 2"...16")	Standard
VERSAFLOW - X-Mode (DN200.... 1250/8"....50")	Standard
VERSAFLOW - large (DN200...DN4000 / 8...160")	Standard

PIPE SPECIFICATIONS	
Material	Metal, plastic, ceramic, asbestos cement, internal/external coated pipes (coatings and liners fully bonded to pipe wall)
Maximum pipewall thickness	≤ 200 mm/7.87"
Liner thickness	< 20 mm / 0.79"

PROCESS TEMPERATURE	
-40...120°C / -40...284°F	Standard
-40...200°C / -40...392°F, XT version	Option

SENSOR CABLE LENGTH	
6m / 18ft	Fixed
10m / 30ft	Fixed
5m / 15 ft up to 25m / 75ft	Optional: extension cable with cable (splitter) box

RECOMMENDED MOUNTING AREAS	
Inlet run	~ 10DN straight length
Outlet run	~ 5DN straight length

VERSAFLOW ULTRASONIC FLOW CONVERTER

VERSIONS	
W (wall mount), remote version	TWS9000 W (general purpose)
F (field mount), remote version	TWS9000 F (non-Ex)
F (field mount), remote version	TWS9000 F-Ex

DISPLAY LANGUAGES	
With Local display, graphic LCD, backlit	Standard
English, French, German	Standard

FLOW SENSOR	
VERSAFLOW	DN15...4000 / ½"...160[1]

COMMUNICATION	
Current, pulse & status output	Standard
HART® communication, control input	Standard
Modbus RS485	Option

POWER SUPPLY	
100...230 VAC (-15/+10%), 50/60 Hz	Standard
24 VAC/DC	Option
Power consumption	DC: 12 W 22 VA

APPROVALS	
Ex - zone 1 (ATEX & IECEx)	Option
QPS (US) - Class I DIV 1	Option
QPS (Canada) - Class I DIV 1	Option

PROTECTION CATEGORY

Converter: W (wall) F (field)	IP66/67 (eq. to NEMA6)
Flow Sensor	IP66/67 (eq. to NEMA6) IP68 (optional)

TEMPERATURE

Process	see flow sensor	
Ambient	-40....60°C /	-40....140°F
Storage	-50....70°C /	-58....158°F

CABLE CONNECTION

M20 x 1.5	Standard
½" NPT	Option
PF ½"	Option

MATERIALS USED

Polyamide - polycarbonate (W-version)	Standard
Die-cast aluminium with polyurethane coating) (F-version)	Standard
Stainless steel 316 L / 1.4408 (F-version)	Option

I/O SPECIFICATIONS

OVERALL FUNCTIONALITY

Function	Continuous measurement of actual volume flow, mass flow, flow speed velocity of sound gain SNR diagnosis value. Bidirectional flow measurement and totalisation. Signal quality bar graph

CURRENT OUTPUT

Function	All operating data configurable; galvanically isolated; HART® communication
Output	Measurement of volume flow, mass flow, flow speed, velocity of sound, gain, signal to noise ratio, diagnostics, HART® communication
Settings	
Q = 0% Q = 100%	0...20 mA/4-20 mA, 10-20 mA
Error identification	0...22 mA/3.5...22 mA

CONNECTION ACTIVE:

Basic/Modular IO	I ≤ 22 mA / RL ≤ 1 kOhm

CONNECTION PASSIVE:

Basic/Modular IO	L ≤ 22mA / U ≤ 32 VDC

PULSE OUTPUT AND STATUS OUTPUT

Function	Configurable as pulse output, identification for automatic range change, indicator of flow direction, overflow, errors, trip point or empty pipe indication
Settings	Valve control, if batch control function is activated
Q = 100%	0.01...10000 pulses/s or pulses/ volume
Pulse width	0.05 ... 2000 ms or auto or sym.
Status	On or Off

CONNECTION ACTIVE:

Basic IO	On request
Modular I/O | fmax <= 100 Hz,	<=20mA, RL,max = 47Kohm (use ohm symbol)
fmax = 100Hz <fmax<=10Hz;	<=20mA, RL, max < 1Kohm for f<=1 khz

CONNECTION PASSIVE:

Basic/Modular IO	fmax<=100Hz; I <=100mA
	100Hz < fmax <=10kHz; I <=20mA
	U<=32 VDC; I<=0.05mA

CONNECTION NAMUR:

Basic IO	On request

CONTROL INPUT

Function	Freeze output (e.g. during cleaning), forced return to zero, counter and error reset, ext. range selection.
Settings	Freeze outputs, output zero, reset counter, reset error start batch (in batch mode)

CONNECTION

Modular IO: Active	l nom = 4mA / Unom = 22VDC
Basic IO: Passive	Uon > 8VDC / Uoff <= 2.5VDC U<= 32VDC
Modular IO: Passive	U<=32 VDC; Uon >=3 VDC/Uoff <=2.5 VDC
Namur (ace. to EN 60947-5-6	Active

[1] Outer Diameter: 20...4300 mm / 0.79...169.29"

I/O MODULES

1	I/O	2	1st module	3	2nd module	
1	Basic	0	no module possible	0	no module possible	
4	Modular (Ia + Pa)	8	no module	8	no module	
6	Modular (Ia + Pp)	A	Ia	A	Ia	Ia = current output - active
7	Modular (Ia + Pn)	B	Ip	B	Ip	Ip = current output - passive
8	Modular (Ip + Pa)	C	Pa/Sa	C	Pa/Sa	Pa/Sa = pulse/status output - active, high current
B	Modular (Ip + Pp)	E	Pp/Sp	E	Pp/Sp	Pp/Sp = pulse/status output - passive, high current
C	Modular (Ip + Pn)	F	Pn/Sn	F	Pn/Sn	Pn/Sn = pulse/status output - passive, Namur
G	RS485 Modbus	8	mudule	8	no mudule	

The TWS9000 with standard basic I/O (SM11) covers almost all applications:

• Active/passive current output (+HART®)

• Passive pulse/status output

• Passive status output

• Passive status output / control input

The l/0-module combination is thus 1-0-0 (see above).

The TWS9000 with modular I/O (SM12) can be tailor-made to any application:

• Suppose you require a converter with passive pulse output and 3 passive current outputs. The l/0-module combination then becomes B-B-B.

• Suppose you require a converter with 2 active pulse/status outputs. The l/0-module combination then becomes either 4-C- 8 or 8-C-8 (depending on whether active or passive current output is required). The latter '8' indicates that 1 additional module can be added in future.

I/O MODULE COMBINATION POSSIBILITIES

COMMUNICATIONS		
	Basic I/O (SM11)	Modular I/O (SM12)
CURRENT OUTPUT		
Active/passive	■	■
HART	■	■
PULSE AND STATUS OUTPUT		
Active		
Passive	■	
Namur (acc. To EN 60947-5-6)		
CONTROL INPUT		
Active		
Passive	■	
Namur (acc. To EN 60947-5-6)		

EXAMPLE FOR COMBINATION OF I/O'S

Basic I/O

1	2	3
1	0	0

Modular I/O

1	2	3
4	8	8
	A	8
		A
		C
		G
	C	8
		C
		G
	G	8
		G

1	2	3
8	8	8
	B	8
		B
		C
		G
	C	8
		C
		G
	G	8
		G

1	2	3
G	8	8
	A	8
		A
		C
		K
	C	8
		C
		K
	K	8
		K

1	2	3
6	8	8
	A	8
		A
		E
		K
	E	8
		E
		K
	K	8
		K

1	2	3
B	8	8
	B	8
		B
		E
		K
	E	8
		E
		K
	K	8
		K

1	2	3
7	8	8
	A	8
		A
		F
		H
	F	8
		F
		H
	H	8
		H

1	2	3
C	8	8
	B	8
		B
		F
		H
	F	8
		F
		H
	H	8
		H

Notes:

2 Modular I/O: up to 2 additional in-/output module possible (see l/0-module combinations)

DIMENSION AND WEIGHT
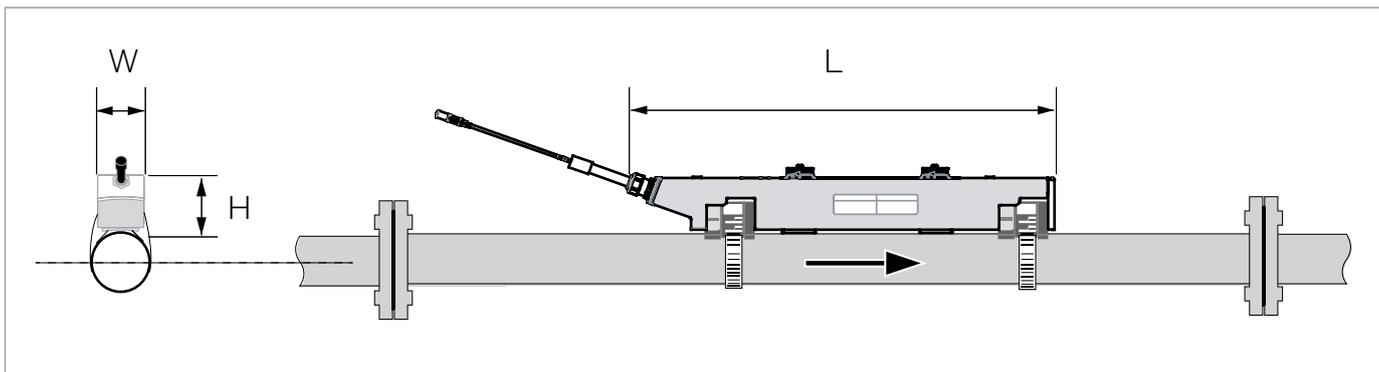
Dimensions clamp-on sensor rail(s)

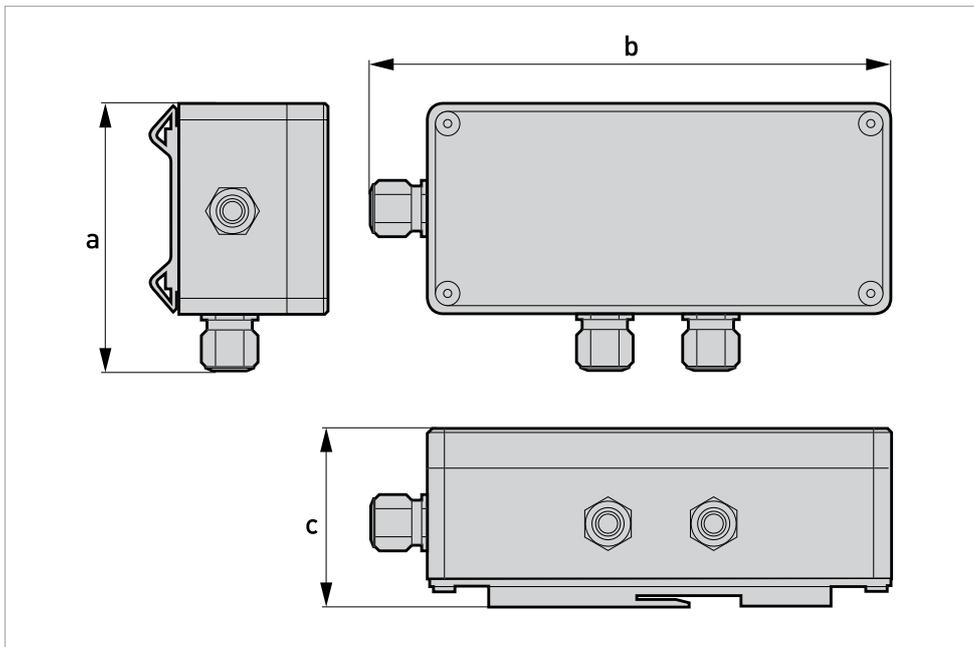| Sensor rail(s)	Dimensions [mm]			Approx. weight (without cable/strip) [kg]
	L	H	W	
Small	412	69	50	1.9
Medium	741	69	50	2.6
Large	412 ❶	69 ❶	50 ❶	3.6

Dimensions and weight clamp-on sensor rail(s) [mm - kg]

❶ value for one of the 2 delivered rails

Sensor rail(s)	Dimensions [inches]			Approx. weight (without cable/strip) [lbs]
	L	H	W	
Small	16.2	2.7	2.0	4.2
Medium	29.2	2.7	2.0	5.7
Large	16.2 ❶	2.7 ❶	2.0 ❶	7.9

Dimensions and weight clamp-on sensor rail(s) [inch - lb]

❶ value for one of the 2 delivered rails

Cable (splitter) box Dimension of the aluminium cable (splitter) box for extended connection cable lengths

Dimensions

	Dimensions [mm]			Approximately weight without cable [kg]
	a	b	c	
Cable box	115	210	67	0.9

Dimensions and weight cable box [mm – kg]

	Dimensions [inches]			Approximately weight without cable [lbs]
	a	b	c	
Cable box	4.53	8.27	2.64	2.0

Dimensions and weight cable box [inch – lb]

Authorized Distributor:

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