tekSon TS Series Low Cost Ultrasonic Water Energy Flow Measurement

tekflo sensors are proud to present their **tekson** TS Series ultrasonic water energy meter, which uniquely meets EN1434 Class 1 total energy system accuracy for pipe sizes 15mm to 2000mm (1/2" – 80") pipe diameter.

tekSon measures hot or chilled water energy by continuous sensing of the multiplication of flow rate and the differential temperature of the inlet and outlet temperature to a chiller or heat generator.

The versatile TS ultrasonic flow sensors may be clamped horizontally on the same side of the pipe on existing hot or chilled water pipes from 15mm (1/2) diameter. Alternatively, they may be inserted diagonally opposite each other into weld bosses at an angle to the centre line on existing pipes from 32mm (11/4"). A complete spool piece is also available for pipe sizes from 25mm (1"). All types have a maximum diameter of 2000mm (80").

Twin **tekSon** ultrasonic sensors operate on the most accurate time of flight principle, employing 4-byte IEEE 754 floating point computation. Each sensor embodies a solid state piezo-ceramic crystal, which acts alternatively as transmitting or receiving ultrasonic pulse generators, in either V formation up to 50mm or diagonally for the larger pipes. In each case the flow rate is proportional to the time difference between the transmitted and received ultrasonic pulses.

The complete system including flow sensing, matched differential temperature sensing and the all-digital computation of energy, meets EN1434 Class 1 system accuracy of < ± 1 of reading over a 10 : 1 energy flow range and < ± 1.2% of reading over a 30 : 1 energy flow range.

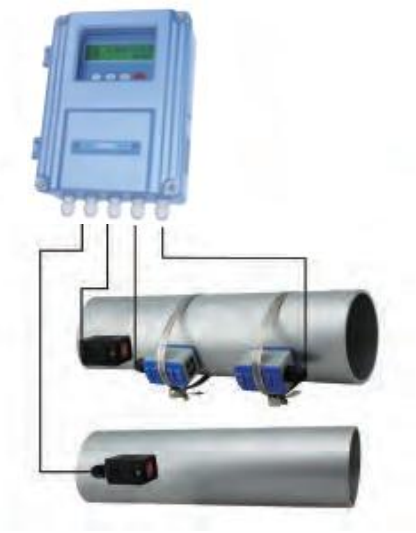
Each **tekson** flow sensor is supplied with a customised flow Calibration Certificate traceable to USA NIST (National Institute of Standards and Technology). The temperature sensors are certified to meet a minimum differential temperature of 3º Kelvin with EN1434 Class 1 accuracy status.

The **tekSon** has a 4-20mA input, which may be used with a **tekMag** magnetic flow sensor as an alternative to the ultrasonic sensors input. The EN1434 Class 1 accuracy still applies.

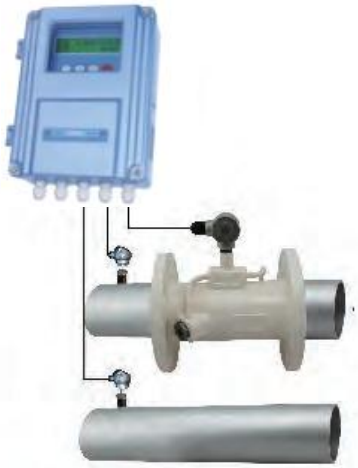
Features:

- The only ultrasonic energy system meeting EN1434 Class 1 for sizes from 15 – 2000mm diameter
- **tekSon and tekMag** are custom calibrated with system certified accuracy traceable to USA NIST
- **tekson** and **tekMag** sensors are independent of media density variation caused by additives such as glycol, propylene glycol, brine etc. Note: turbine flow or other small meters cannot claim this
- Low cost. Clamp-on sensors installed on existing pipe lines have no pipe modification costs
- Suitable for metal or plastic PVC/FRP and similar pipes
- Flow and temperature sensors are submersible to IP68 and NEMA 6 P to 1 m water gauge
- Clamp-on sensors may be used for NIST traceable on-site revalidation of other energy sensors
- Matched temperature sensors certified to a minimum differential of 3º Kelvin with NIST traceability
- 3-wire Pt 100 temperature sensors suitable for minus 30 to + 160º C (minus 22 to + 320º F)
- Solid state, non- media contact flow sensors with no moving parts
- Zero pressure loss, unlike turbine type meters or Spire's labyrinth 'Z' ultrasonic system
- Suitable for small air bubble entrainment and turbidity to 10000 ppm
- Continuous mean velocity sensing from zero to 10 m/s. No mechanical cut-off.
- 4-20mA and scaled pulse, isolated hi/lo relay outputs, RS485 data interface
- 3 x 4-20mA inputs for use with alternative magnetic flow and temperature sensors

TYPICAL APPLICATIONS

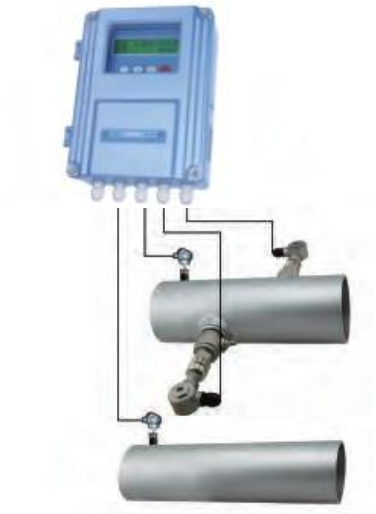


- **Clamp-on transducer** without piping modification
- Ease of installation and maintenance
- Energy heat flow measurement with paired Pt100Ω temperature sensors
  Pipe Size from DN15-DN6000
  (ANSI 150lb rf 0.5” – 236”)

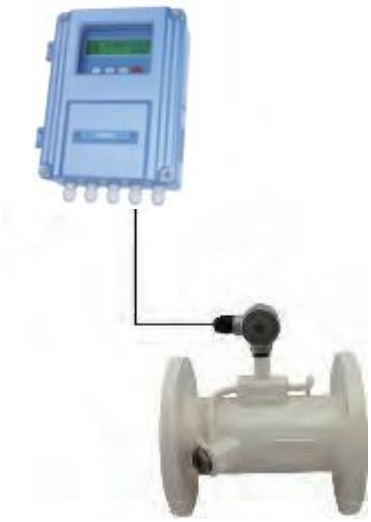


- **In-Line transducer** Spool piece from DN25-DN2000 (ANSI 150lb rf 1"-80")
- Ease of installation and maintenance
- Energy heat flow measurement with paired Pt100Ω temperature sensors
- High Accuracy, Stable & Reliable

TYPICAL APPLICATIONS



- **Insertion transducer** from DN80-DN2000 (ANSI 150lb rf 1¼"-80")
- Ease of installation and maintenance
- Energy heat flow measurement with paired Pt100Ω temperature sensors
- Stable & Reliable



- **In-Line transducer** Spool piece from DN25-DN2000 (ANSI 150lb rf 1"-80")
- Ease of installation and maintenance
- High Accuracy, Stable & Reliable

Applications:

- with Clamp-on transducer - sanitary, corrosive and abrasive liquids. Useful in power & nuclear industry application
- In-line transducer integral in Spool piece

eg. water, oil, high turbidity liquid, speciality chemicals, etc.

ULTRASONIC TRANSDUCERS

Type	Outlook	Type	Model	Pipe Size	Temp	Dimension
Standard Clamp-On		Small	S2	DN15 - DN100	0 - 70°C	45 x 25 x 32mm
		Med	M2	DN50 - DN700	0 - 70°C	64 x 39 x 44mm
		Large	L2	DN300 - DN2000	0 - 70°C	97 x 54 x 53mm
High Temp Clamp-On		Small	S2H	DN15 - DN100	0 - 160°C	45 x 25 x 32mm
		Med	M2H	DN50 - DN700	0 - 160°C	64 x 39 x 44mm
		Large	L2H	DN300 - DN2000	0 - 160°C	97 x 54 x 53mm
Insertion		Standard	I2L	DN80 - DN2000	0 - 160°C	335x80x55mm
In-Line with Pipe Spool		Standard	G1	DN32 - DN2000	0 - 160°C	CS Flange Conn

Type	Technical Data	
Transmitter	Technique	Ultrasonic Transit Time, 4-byte IEEE754 floating point arithmetic
	Accuracy	Better than +/- 1.0%
	Repeatibility	Better than 0.2%
	Output	One channel isolated 4 -20mA or 0 - 20mA
		One channel OCT output (width 6-1000ms, default @ 200ms)
		One channel isolated relay output
	Input	3 x 4-20mA eg. From pressure, temperature or level transmitters
	Input	Direct 3-wire Pt100Ω resistance sensors for energy BTU measurement
	Data Interface	Isolated RS-485
Sensor Cable		Standard length 5 meters
Piping	Material	Steel, Stainless steel, Cast Iron, Copper, PVC, Aluminium, FRP etc
	Pipe Size	15 to 2000 mm (¼ - 80 inches)
	Installation	Upstream 10D, Downstream 5D and 30D away from pump outlet
Medium	Fluid	Water, Seawater, Acids, Beer, Alcohol, Oil & fluid than pass u/s energy
	Temperature	0 - 160°C
	Turbidity	10000 ppm and with little bubbles
	Velocity	0 to +/- 10 m/sec
Environment		Transmitter : minus 20 to 60°C, Transducer : minus 30 to 160°C / 85%RH
Supply		8 - 36VDC or 85 - 264VAC 50/60Hz / 1.5watt
Protection		IP65 Transmitter, IP68 Transducer

tekSon Ultrasonic Flow Sensor Ordering Code

Basic type Example :	tekSon TS	W	G1	1	B	N	100m3/hr	
Transmitter Type	Wall Mounted	W						
	Panel Mounted	P						
Ultrasonic Transducer	Standard Clamp-On (small)		S2					
	Standard Clamp-On (medium)		M2					
	Standard Clamp-On (large)		L2					
	High Temp Clamp-On (small)		S2H					
	High Temp Clamp-On (medium)		M2H					
	High Temp Clamp-On (large)		L2H					
	Insertion type		I2L					
	In-Line with Spool Piece type		G1					
Sensor Cable Length	5 meters			1				
	10 meters			2				
Power Supply	8 - 26VDC				A			
	85 - 264VAC				B			
Temperature Sensor	Matched Pt100Ω Sensors (Yes = Y, No = N)					N		
Normal flow range	To specify when ordering eg. 0 - 100 m3/hr, litres/hr, litres/min, gallons/hr etc.						100m3/hr	

tekSon TS Enquiry Form

Customer's Name, Project Name, & Location:						
Detail	**Sensor 1**	**Sensor 2**	**Sensor 3**	**Sensor 4**	**Sensor 5**	**Sensor 6**
Quantity						
Media Type ADD any special notes, such as Dirty (D), Clean (C), Bubbles (B).						
Typical Flow Rate With Units						
Min & Max Flow Rate With Units						
Cable Length (8m / 26 feet standard)						
Bi-directional (B)/ Uni-directional (U)						
Pressure Range and Units						
Temperature Range and Units						
Liquid Viscosity and Units						
Explosive Atmosphere and Type Required						
Nominal Pipe Size (N) or ID (I) Specify mm or inches						
Pipe Schedule or Wall Thickness Specify mm or inches						
Straight Pipe Runs Available						
Pipe Material Is Pipe Electrically Isolated (Yes/No)						
Is the flow sensor to be used in an area of magnetic fields ? Yes or No						
Electronics Weatherproof (WP), Local (L), or Remote (R)						
Analog and Pulse Frequency						
Is Communication Network Required? If yes, specify which						
Complete Energy System (Yes/No) Requires 2 temperature sensors						
Mass (M) or Volumetric (V) Flow.						
Sensor Submersible (Yes/No) If yes, to how many metres w.g. Not available with temperature sensors						

tekflo sensors®

Factory & Flow Laboratories:
Block 2, #04 – 685
Balestier Road
Singapore 320002
Office : +65-67753340

Sales and Service: sales@tekflosensors.com
Emergency 24-Hour Service: +65 (0) 882 692 768
Website: www.tekflosensors.com