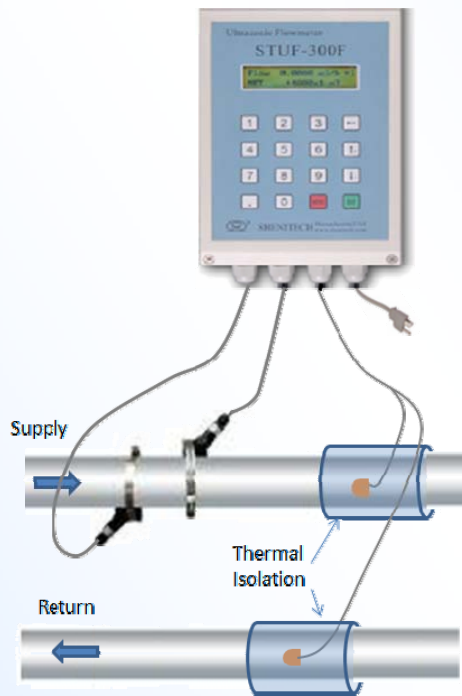


STUF-300R1B



Advanced Clamp-on Transit-time Technologies

# Ultrasonic Thermal Energy Meter



## Features:

- Energy rate and total consumption measurement
- Non-intrusive clamp-on technology. Easy and economical installation
- No moving parts to worn out. Long-life span. Maintenance-free
- High accuracy
- Wide flow measurement range, bi-directional
- Built-in totalizers, batch controllers and etc.
- Isolated RS-485 interface. Supports the MODBUS
- Abundant input/output, such as 4-20mA output, relay output, pulse output, alarm output, etc.
- Suitable for pipes from 0.5" to 240"
- Optional wireless capability
- Optional remote data collection/billing software
- Large data logger for recording multiple variables
- Easy to use and set up. Self-explanatory menu-driven programming
- NEMA 4X (IP65) weather-resistant enclosure
- Suitable for virtually any liquid heating/cooling systems such as HVAC, office buildings, apartment complexes, condominiums, solar heating systems and geothermal systems

The STUF-300R1B ultrasonic thermal energy meter provides abundant capabilities for accurate thermal energy measurement of a liquid-based thermal energy production / transferring system. It is the 3rd generation energy meter from Shenitech. Compared with its predecessors, the 3rd generation offers better performance and a richer feature set, all at a lower price.

The STUF-300R1B system is consisted of the high performance ultrasonic flowmeter STUF-300F1B and a pair of standard PT100 temperature sensors. The ultrasonic flowmeter is based on our cutting-edge clamp-on flow measurement technology, which is capable of measuring the flow from outside of a pipe accurately and reliably. Due to the non-intrusive nature of this technology, there is no pipe cutting, no moving parts, no pressure drop, no leaks and no risk of contamination. In addition, the installation is simple and requires no special skills or tools.

The two PT100 sensors, which can be either insertion type or surface-mounting type, are used to measure the

temperature of the supply flow and the return flow. The energy consumption rate is then calculated based on the temperature difference and the measured flowrate. A built-in energy totalizer is used to add up the amount of energy delivered.

STUF-300R1B provides versatile input/output interfaces, such as isolated digital outputs, relay output, batch control, alarm, 4-20mA output. In addition, the built-in isolated RS-485 port with surge protection and MODBUS support makes remote energy monitoring and energy meter networking easy and reliable.

With optional wireless module and Shenitech's data collection/billing software, STUF-300F1B can be used to manage energy production/consumption systems remotely and automatically.

STUF-300R1B is an ideal choice for improving HVAC, energy production and building energy efficiency in terms of heating, cooling ventilation and air-conditioning.

## Specifications:

Main Unit	Repeatability	Better than 0.2%
	Accuracy	For flow measurement: $\pm 1\%$ of reading, plus $\pm 0.006\text{m/s}$ ( $\pm 0.02\text{ft/s}$ ) in velocity
	Response Time	0.5s. Configurable between 0.5s and 99s
	Velocity	-16 ~ +16m/s (-52 ~ +52 ft/s), bi-directional
	Display / Keypad	LCD with backlight. 2 x 20 letters. 4 x 4 tactile-feedback membrane keypad. Displays instantaneous energy rate, total energy (positive, negative and net), temperatures, flow rate, time, analog inputs, etc.
	Units	English (U.S.) or metric
	Signal Outputs	Current output: 4-20mA isolated output for energy rate, flowrate, velocity or sound speed. Impedance 0-1k. Accuracy 0.1%
		OCT output: isolated Open Collector Transistor output. Up to 0.5A load Relay output: 1A@125VAC or 2A@30VDC Can be programmed as pulse signal for energy/flow totalization; ON/OFF signal for relay drive or alarm drive; batch control
		Sound alarm
	Temperature and other Analog Inputs	RTD interface: two temperature channels that can accommodate two PT100 3-wire temperature sensors for thermal energy measurement. Analog input: one channel of 4-20mA input. Can be used for temperature, pressure and level
	Recording	Automatically records the totalizer data of the last 128 days / 64 months / 5years Optional SD data logger (2GB space) or external USB data logger
Communication Interface	Isolated RS-485 with power surge protection. Supports the MODBUS protocol StufManager™ PC software for real-time data acquisition (optional) Optional wireless module (GPRS/GSM/RF) for remote monitoring (STUF-300RnB only)	
Enclosure	Protection Class: IP65 (NEMA 4X) weather-resistant. Additional protection enclosure (large polycarbonate enclosure) available upon request (STUF-300R2B model only). Dimension: 230mm x 150mm x 75mm (9" x 5.9" x 3")	
Liquids	Liquid Types	Virtually all commonly used liquids (full pipe)
	Liquid Temp	-40°C ~ 100°C or -40°C ~ 155°C, depending on transducer type
	Suspension concentration	<20,000ppm, or, < 2%, particle size smaller than 100um.
Pipe	Pipe Size	DN15 ~ DN6,000mm (0.5" ~ 240"), depending on transducer type
	Pipe Material	All metals, most plastics, fiber glass, etc. Allow pipe liner.
	Straight Pipe Section	Longer than 15D, where D is pipe diameter. If a pump or a valve is nearby upstream, the straight pipe section following the pump should be > 25D.
Cable	Shielded transducer cable. Standard length 15' (5m). Can be extended to 1640' (500m). Contact the manufacturer for longer cable requirement.	
Environment	Temperature	Main unit: -10°C ~ 70°C (14°F ~ 158°F)
		Ultrasonic Transducer: -40°C ~ 100°C (-40°F ~ 212°F) for standard version -40°C ~ 155°C (-40°F ~ 312°F) for higher temperature version PT100 temperature sensor: -40°F ~ 312°F (-40°C ~ 155°C)
Humidity	Humidity	Main unit: 85% RH
		Ultrasonic Transducer: water-immersible, water depth less than 10' (3m)
Power	DC: 12 ~ 24VDC, or, AC: 90 ~ 260VAC Power consumption: < 1.5W at 12VDC	
Weight	Main unit: 2 kg (4 lbs) for standard version, 2.5 kg (5 lbs) for network version	








## Applications:

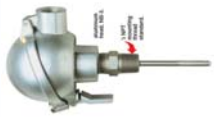
The STUF-300R1B thermal energy measurement system is an ideal choice for a wide range of applications in HVAC, energy production, energy transfer, building management, university facility management, district heating and cooling, geothermal or solar-thermal system monitoring, and all other liquid-based thermal energy production/transferring.

Some examples are:

- Chilled water sub-metering
- Hot water sub-metering
- Condenser water
- Glycol
- Thermal storage
- Geothermal system
- Solar hot-water system
- Lake source cooling
- Chemical feed, ammonia feed
- Energy meter network
- Power plants

## Transducer Options:

	<p>Type HFx: Special transducer for small size pipes DN15 ~ DN25mm (0.5" ~ 1")            Temperature range -20°C ~ 60°C (0°F ~ 140°F)  <i>x represents pipe material: 0-Copper; 1-Tubing; 2-ANSI Plastic; 3-ANSI Metal</i></p>
	<p>Type S1x: Standard-S1 transducer (magnetic) for pipes DN25 ~ DN100mm (1" ~ 4")            Temperature range -40°C ~ 80°C (-40°F ~ 175°F)  <i>x represents pipe material. Same as above</i></p>
	<p>Type S1HTx: High-temp S1 transducer for small size pipes DN25 ~ DN100mm (1" ~ 4")            Temperature range -40°C ~ 155°C (-40°F ~ 312°F)  <i>x represents pipe material. Same as above</i></p>
	<p>Type M1: Standard-M1 transducer (magnetic) for medium size pipes DN50 ~ DN700mm (2" ~ 28")            Temperature range -40°C ~ 80°C (-40°F ~ 175°F)</p>
	<p>Type M1HT: High-temp M1 transducer for medium size pipes DN50 ~ DN700mm (2" ~ 28")            Temperature range -40°C ~ 155°C (-40°F ~ 312°F)</p>
	<p>Type L1: Standard-L1 transducer for large size pipes DN300 ~ DN6,000mm (11" ~ 240")            Temperature range -40°C ~ 80°C (-40°F ~ 175°F)</p>
	<p>PT100SM: surface-mount temperature sensor, 3-wire PT100            Thermal isolation around the sensor is recommended in order to get a temperature reading close to the liquid temperature</p>



PT100IN: Insertion type temperature sensor, 3-wire PT100  
Users may use their own RTD temperature sensor

## Model Selection:

**STUF-300R1B** - □ - □ - □ - □ - □ - □ - □

### Transducer:

Hf<sub>x</sub> – Special transducer for 0.5”-1” \*  
S1<sub>x</sub> – Standard S1-type for pipes 1” – 4” \*  
S1HT<sub>x</sub> – High-temperature version of the S1-type \*  
M1 – Standard M1-type for pipes 2” – 28”  
M1HT – High-temperature version of the M1-type  
\* *x* represents pipe material: 0-Copper; 1-Tubing; 2-ANSI Plastic; 3-ANSI Metal

### Temperature Sensor:

PT100SM – With a pair of PT100 sensors, surface-mount  
PT100IN – With a pair of PT100 sensors, insertion mount  
NO or absent – No temperature sensor

### Temperature Sensor Lead Length:

A – 1meter (3ft); B – 3meters(9ft); C – 10meters (30ft)

### Pipe Size:

DNxxx (metric) or INxxx (English)

### Transducer Cable Length:

M<sub>xx</sub> – Cable length in meters  
F<sub>xx</sub> – Cable length in ft

### 4-20mA Output:

AO – With 4-20mA output  
NAO or absent – No 4-20mA output

### Other Options:

DLSD – With SD data logger (2GB)  
DLUSB – With external USB data logger  
SW – StufManager™ PC software  
485USB – RS485-to-USB convertor

### Example:

Model# STUF-300R1B-M1-PT100SM-A-DN100-M5-AO-DLSD stands for standard main unit, M1-type clamp-on transducer and PT100 surface-mount sensor for pipe size DN100mm, 1m lead for temperature sensor and 5 meter cable for flow transducer, with 4-20mA output and SD data logger.

Note: If you prefer to work with the English system for the model number, please put “IN” (for inch) or “F” (for foot) right before the dimension values. For example, the above model# in the English system will be: STUF-300R1B-M1-PT100SM-A-IN4-F15-AO-DLSD.



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