



# tPrime™ Series

# 280T



## ULTRASONIC HEAT METER

- *Low pressure drops*
- *Ready for AMR/AMI /BMS integration*
- *Insensitive to sand, sediment, or other particles*
- *No moving components leads to no maintenance*
- *Multi-path technology tackles large pipes with improved accuracy*

280T represents the latest innovation of Spire Metering's reliable tPrime™ inline ultrasonic heat meter series.

This heat meter (also called BTU meter), in accordance with OIML R75, is designed specifically to capture energy consumption in challenging heating and cooling applications while integrating into crucial AMR/AMI/BMS network and billing solutions.



- **SUBMETERING (AMR/AMI/BMS)**
- **DISTRICT HEATING/COOLING**
- **GREEN ENERGY MANAGEMENT**
  - *Campus/Hospital/Malls*
  - *Carbon Credits*
  - *Cost Centering*
  - *Residential*
  - *Commercial*

**MEASURE TODAY**  
**ENSURE TOMORROW**

## FEATURES AND BENEFITS

Manufactured to be rugged, the 280T has sensor bodies constructed of bronze and steel. With no moving components, once installed the meter remains accurate and maintenance free. The single box, straight through sensor design leads to zero blockage and miniscule pressure drops. This robust design is ideal for heating and cooling loops as the meter remains steadfast and accurate even when tasked with measuring the dirtiest liquids.

### With SPIRE METERING's 280T, **you can:**

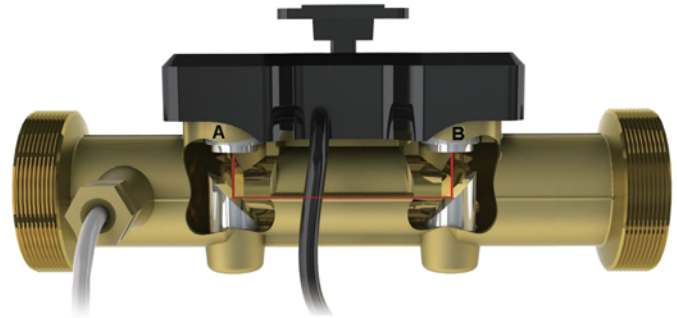
- Remain proactive and identify leakage in order to capture lost revenue by detecting leaks as low as a few drops per second.
- Reliably integrate into AMR/AMI/BMS networking solutions using M-Bus, MODBUS, radio, pulse, BACnet, and more.
- Reliably operate the unit with excellent long-term stability backed by a 2 year warranty, as accuracy does not degrade over time.
- Reduce operational costs over the long run.
- Meter hot/cold water in common heating/cooling applications.
- Capture precise readings with robust ultrasonic transit-time technology.
- Ensure optimal field performance with a 10 year battery life.
- Register accurate readings as air is not measured.
- Guarantee enduring meter performance as the unit is insensitive to sand, sedimentation and other particles.
- Detect reverse flow.
- Automatically switch to power over M-Bus when available to conserve battery.
- Remain confident with a tamperproof design.
- Achieve long-term stability, far surpassing mechanical meter degradation by heat, cycling, particles, and scales.
- Remain insensitive to orientation as the separable calculator enclosure optimizes user convenience.



**MEASURE TODAY**  
**ENSURE TOMORROW**

# OPERATING PRINCIPLE

Using the ultrasonic transit-time measuring technology, emitted ultrasonic pulses are sent back and forth between two ultrasonic transducers, A and B. Two reflectors are used to direct the ultrasound beam from one transducer to another. The liquid velocity is determined by the difference in measured transit-times between beams sent into (downstream) and against (upstream) the direction of liquid flow. The meter is fitted with two temperature sensors to monitor thermal impact of return and supply flows. These readings, crossed with velocity and delta temperature changes, determine thermal (BTU) consumption. Furthermore, thermal energy is calculated according to OIML R75 standard.



## Unique Multi-path Technology

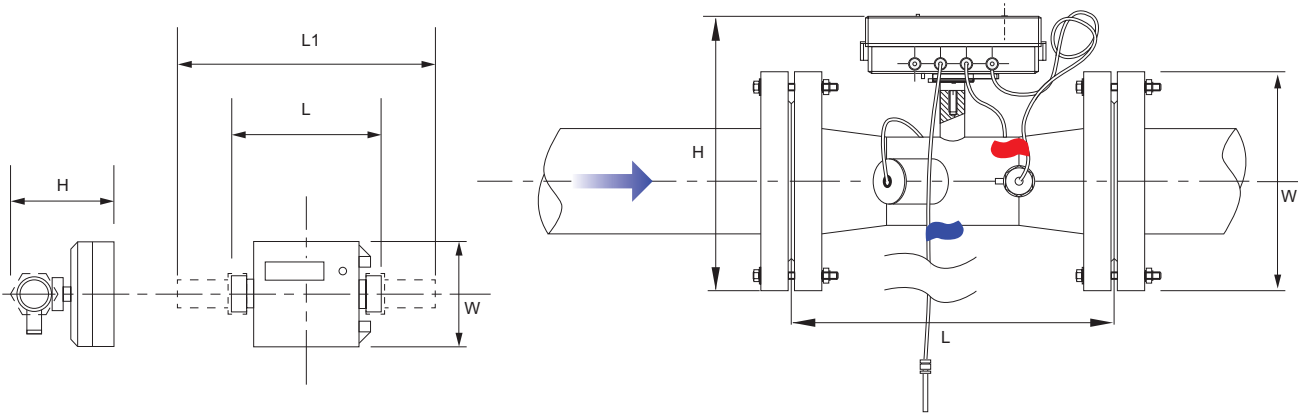
For large size meters, it is not easy to install the flow sensor perfectly in line with the pipe line. A small misalignment could cause flow profile distortion inside the flow sensor, thus, causing significant measurement errors. Spire Metering developed a unique multi-path technology to solve this problem. Two/four pairs of ultrasonic transducers are mounted on the flow sensor body to interrogate the flow from two/four different paths. A flow calculation algorithm based on fluid dynamic theory is then used to derive an average flow reading with improved accuracy.



# TECHNICAL SPECIFICATIONS

Size		Flowrate						Dimension			Weight (kg)	Pipe Joint (BSP / DIN)
(mm)	(in)	qn		qmin		qmax		L (mm)	W (mm)	H (mm)		
		(m <sup>3</sup> /h)	(gpm)	(m <sup>3</sup> /h)	(gpm)	(m <sup>3</sup> /h)	(gpm)					
15	½	1.5	6.61	0.03	.13	3.0	13.2	110	120	86	0.7	G3/4B
20	¾	2.5	11	0.05	.22	5.0	22	130	120	86	0.8	G1B
25	1	3.5	15.4	0.07	.31	7.0	30.8	160	128	89	0.9	G1 1/4B
32	1¼	6.0	26.4	0.12	.53	12.0	52.8	180	130	96	1.3	G1 1/2B
40	1½	10	44	0.2	.88	20	88.1	200	134	98	1.8	G2B
50	2	15	66.1	0.6	2.64	30	132	200	165	190	5.6	Flange – Nut 4-M16
65	2½	25	110	1.0	4.4	50	220	200	185	204	6.6	Flange – Nut 4-M16
80	3	40	176	1.6	7.05	80	352	225	192	220	9.0	Flange – Nut 8-M16
100	4	60	264	2.4	10.6	120	528	250	220	240	11.6	Flange – Nut 8-M16
125	5	100	440	4.0	17.6	200	881	250	230	235	16.2	Flange – Nut 8-M16
150	6	150	661	6.0	26.4	300	1321	300	265	270	16	Flange – Nut 8-M20
200	8	250	1101	10.0	44	500	2202	350	350	320	22	Flange – Nut 12-M20
250	10	400	1761	16.0	70.5	800	3523	450	405	405	60	Flange – Nut 12-M24
300	12	600	2642	25.0	110	1200	5284	500	460	460	80	Flange – Nut 12-M24

# TECHNICAL SPECIFICATIONS



Notes: \* Larger size BTU meters are available upon request.  
 \*\* Weight may differ depending on accessories.  
 \*\*\* Pipe joint could be NPT / ANSI flange upon request. For DN50–DN100, the flange is removable.

## Rated Operating Conditions

Maximum Admissible Pressure, Operating (MAP) :	16 bar (1.6 MPa)
Static Current :	<10uA
Battery Life :	10 years at $t_{BAT} < 30^{\circ}\text{C}$ (86°F)
Battery Type :	Lithium, 3.6V
Network Power Supply :	Automatically switch to M-Bus or RS485 Power if available
Accuracy Class :	Class 2 (OIML R75 Compliant)
Back Flow Detection :	Yes
Operating Liquid Temperature :	
Permissible Flow Temperature :	$2^{\circ}\text{C}$ to $95^{\circ}\text{C}$ / $130^{\circ}\text{C}$ (36°F to 203°F / 266°F)
Permissible Delta T :	3K to 70K
Ambient Class :	Class B
Calculator Protection :	IP68 waterproof, submersible
Flow Sensor Protection :	IP68 waterproof, submersible
Flow Sensor to Calculator Cable :	1.2m (up to 10m upon request)
PT1000 Cable Length :	1.5m (up to 10m upon request)
AMR Connectivity :	M-Bus, MODBUS, BACnet, Pulse, Radio, GSM

## About Spire Metering Technology

Formerly Shenitech, Spire Metering is a global leader in flow and energy management solutions. Through continuous innovation, we transform complex ultrasonic technology into affordable, reliable solutions for accurate flow and energy measurement. Spire Metering offers water, heat, electricity and gas meters as well as AMR/AMI solutions. To find out how we can help today, please tell us about your application.



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