

Rec
10/2/17

11

1

MTSU Clean Energy Initiative Project Funding Request

There are five (5) sections of the request to complete before submitting.

1. General Information	
Name of Person Submitting Request Jeff McConnell	
Department/Office Facilities Services	Phone # (Office)898.5883
MTSU Box # 0032	Phone # (Cell)
E-mail	Submittal Date 10/2/2017

2. Project Categories (Select One)			
Select the category that best describes the project.			
<input checked="" type="checkbox"/>	Energy Conservation/Efficiency	<input type="checkbox"/>	Sustainable Design
<input type="checkbox"/>	Alternative Fuels	<input type="checkbox"/>	Other
<input type="checkbox"/>	Renewable Energy		

3. Project Information	
a. Please provide a brief descriptive title for the project.	
b. The project cost estimate is the expected cost of the project to be considered by the committee for approval, which may differ from the total project cost in the case of matching funding opportunities. Any funding request is a 'not-to-exceed' amount. Any proposed expenditure above the requested amount will require a resubmission.	
c. List the source of project cost estimates.	
3a. Project Title: Ultrasonic flow meter for facilities staff to measure liquid flow rates in HVAC systems and provide recommendations.	
3b. Project Cost Estimate \$5000	
3c. Source of Estimate	
Supplier	

4. Project Description

(Completed in as much detail as possible.)

- a. The scope of the work to be accomplished is a detailed description of project activities.
- b. The benefit statement describes the advantages of the project as relates to the selected project category.
- c. The location of the project includes the name of the building, department, and/or specific location of where the project will be conducted on campus.
- d. List any departments you anticipate to be involved. Were any departments consulted in preparation of this request? Who? A listing may be attached to this form when submitted.
- e. Provide information for anticipated future operating and/or maintenance requirements occurring as a result of the proposed project.
- f. Provide any additional comments or information that may be pertinent to approval of the project funding request.

4a. Scope: Work to be accomplished

Campus heating and ventilation systems

This measuring device will allow facilities to trend and document liquid flowrates at specific locations. This will allow facilities to diagnose individual building problems in an efficient timely manner. This could be done with current staff and the savings could be determined by not having to hire contractors to bring their own device to measure and trend, then provide the information for us.

4b. Scope: Benefit Statement

Allowing facilities to respond to events and issues with flow problems in a timelier manner. Could be used in retrofit applications for precise design information. Overall system performance verification during commissioning efforts. Help determine system capacities and future needs. Savings will be seen from reduced costs in outsourcing the work to be provided.

4. Project Description (continued)
4c. Location of Project (Building, etc.) Campus
4d. Participants and Roles Facilities Engineer: data analysis and recommendations
4e. Future Operating and/or Maintenance Requirements Facilities Technician: Mechanical adjustments to systems to optimize performance.
4f. Additional Comments or Information Pertinent to the Proposed Project n/a

5. Project Performance Information

Provide information if applicable.

- a. Provide information on estimated annual energy savings stated in units such as kW, kWh, Btu, gallons, etc.
- b. Provide information on estimated annual energy cost savings in monetary terms.
- c. Provide information on any annual operating or other cost savings in monetary terms. Be specific.
- d. Provide information about any matching or supplementary funding opportunities that are available. Identify all sources and explain.

5a. Estimated Annual Energy Savings (Estimated in kW, kWh, Btu, etc.)

5b. Annual Energy COST Savings (\$)

5c. Annual Operating or Other Cost Savings. Specify. (\$)

5d. Matching or Supplementary Funding (Identify and Explain)

n/a

• **F-4400 SERIES** •
**PORTABLE CLAMP-ON ULTRASONIC
FLOW METER**



ONICON F-4000 Series Ultrasonic Flow Meters utilize the differential transit time method to measure the velocity of relatively clean liquids in full pipes. By measuring the difference between transit times of ultrasonic sound waves travelling between two transducers, the flow velocity and direction are accurately determined.

DESCRIPTION

ONICON's F-4400 Portable Clamp-on Ultrasonic Flow Meter is the ideal tool for testing and validating flow. The battery operated portable meter utilizes clamp-on transducers to measure flow through the pipe wall. It is designed for use with pipes ranging from 2" through 48" in diameter, and it works with most commonly used pipe materials. Programming is easy with the on-screen menu system. Just enter the pipe diameter, wall thickness and pipe material.

The F-4400 can be powered for up to 18 hours using the internal, rechargeable NiMH battery, or it can be operated continuously with the AC power adapter.

Monitoring flow over time is made easy with the built-in data logger. The logger can capture up to 300,000 points with intervals ranging from 10 seconds to 5 minutes apart. Download data to your PC via USB. A 4-20 mA output is also available when operating from the AC power adapter.

APPLICATIONS

- Flow testing for closed loop HVAC chilled, hot and condenser water systems
- Temporary flow monitoring for domestic/municipal water
- Flow testing for process water & other clean liquids
- Baseline monitoring for project planning

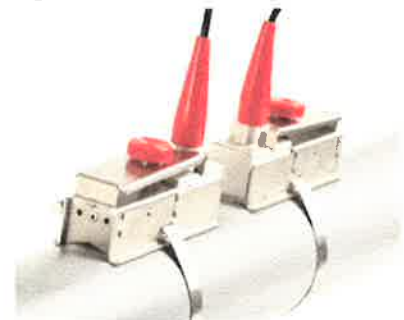
FEATURES

Ideal for Monitoring & Testing - Clamp-on transducers allow for quick installation with no shutdown, no drilling and no pressure drop. Each meter is provided with a built-in data logger making it an ideal solution for monitoring flow over time.

Works with Common Pipe Materials - The F-4400 is designed to work with many different pipe materials including carbon steel, stainless steel, copper, PVC, HDPE fiberglass.

Operates Over a Very Wide Flow Range - The F-4400 is capable of measuring flow over a 400:1 turndown from less than 0.1 ft/sec to 39 ft/sec in velocity. This makes the F-4400 ideal for testing and monitoring many different flow applications, including leak testing.

Simple to Set Up and Use - The F-4400 is easily configured through the handheld backlit display and 5-button keypad interface. Just enter the pipe material and OD, wall thickness and fluid type. The F-4400 will display the correct transducer separation distance.



Typical Installation

Each meter is provided with transducers, cables and mounting clamps and a watertight carrying case.

GENERAL SPECIFICATIONS

ACCURACY

±1% of reading or ±0.1 ft/sec (0.03 m/sec),
whichever is greater

Repeatability & Linearity: ±0.25%

OVERALL FLOW RANGE

0.07 to 39 ft/sec

SENSING METHOD

Clamp-on ultrasonic, differential transit time
method in direct or reflect mode. For clean
liquids in full pipes with less than 2% solids or
gas bubbles

PIPE SIZE RANGE

2" through 48" nominal diameter

POWER SUPPLY OPTIONS

Built-in NiMH battery for up to 18 hours continuous
operation

External charger with 100-240VAC 50/60Hz input

FLUID TEMPERATURE RANGE

Standard: -40° F to 300° F

AMBIENT TEMPERATURE RANGE

-5° F to 140° F

OUTPUT SIGNALS PROVIDED

4-20mA (500 ohm) when powered by AC adapter

USB for data log transfer by direct PC connection

TRANSMITTER

Handheld, ABS plastic

DISPLAY

White, backlit matrix - displays a 5-digit flow rate
with floating decimal point, a 14-digit totalizer, a
calibration menu and a daily flow report



OPERATING RANGE	
Pipe Size (Inches)	Flow Rate (GPM) (0.07 ft/sec - 39 ft/sec)
2	0.70 - 390
2½	1.1 - 585
3	1.6 - 897
4	2.8 - 1,560
5	4.3 - 2,417
6	6.3 - 3,509
8	11 - 6,238
10	18 - 9,748
12	25 - 13,647
14	30 - 16,766
16	40 - 22,224
18	51 - 28,463
20	64 - 35,481
24	92 - 51,467
30	147 - 81,879
36	213 - 118,530
40	264 - 147,382
42	292 - 162,588
48	383 - 213,275

NOTE: Specifications are subject to change without notice.

STANDARD FEATURES INCLUDE:

- One pair SE16B clamp-on, ultrasonic transducers for 2" to 48" (50mm to 1200 mm) pipes
- Transducer cables - 12 ft (3.5m) coaxial with BNC connectors
- Flow rate range - ± 0.07 to 39 ft/sec (± 0.02 to 12 m/sec)
- Installation - stainless steel transducer brackets, mounting clamps, alignment bar and silicone coupling compound kit
- Enclosure - portable ABS with rugged IP67 carry case
- Display - white, backlit matrix LCD
- Totalizer - 14 digit
- Calibration - built-in 5-key programmer
- Damping - keypad adjustable
- Power input - built-in NiMH battery for up to 18 hours operation - external charger with 100 - 240 VAC power input
- Outputs - 4-20 mA (500 ohm), USB
- Data logger - fully programmable 300,000 point capacity
- ONICON Logger PC software for Windows™
- One set cables - 4-20 mA and USB
- One Installation and Operation Manual

DIMENSIONS

