GE Infrastructure
Sensing

Applications

The TransPort PT878 portable liquid flowmeter is a complete portable ultrasonic flow metering system for measurement of:

- Potable water
- Wastewater
- Cooling and heating water
- Ultrapure water and liquids
- Water/glycol solutions
- Crude oil
- Refined hydrocarbons
- Diesel and fuel oils
- Lubricating oils
- Chemicals
- Beverages
- Other liquids

Features

- Small, lightweight and easy to use
- Nonintrusive flow measurement
- Velocity, volumetric and energy flow rates
- Totalized flow and trend data
- Large, backlit LCD display
- Alphanumeric and graphic formats
- Multiple-language user interface
- Rechargeable battery pack
- Logs over 100,000 flow data points
- Submersible package
- 32 site locations
- Optional thickness gauge
- Optional energy measurement
- Suitable for most pipe sizes and materials, including lined pipes

GE Panametrics has joined other GE high-technology sensing businesses under a new name —

GE Infrastructure
Sensing

TransPort® PT878
Portable Ultrasonic Liquid Flowmeter

Portable Flow Metering at Its Best

The GE Panametrics TransPort PT878 flowmeter is a highly versatile, self-contained, portable transit-time system with options and accessories to meet all your liquid flow measurement needs. Its compact size; lightweight, rechargeable battery pack; and universal power supply charger make it the ideal go-anywhere flowmeter.

Accurate with Two-Phase and Perfectly Clean Liquids

The PT878's patented Correlation Transit-Time™ digital signal processing (DSP) technique greatly increases its signal-to-noise ratio for accurate, drift-free flow measurement in liquids that contain a second phase of entrained solids or gas bubbles. The TransPort flowmeter operates in these and other difficult applications where conventional transit-time flowmeters fail.

The TransPort flowmeter also accurately measures flow rate in perfectly clean liquids containing no "scatterers," where Doppler-type flowmeters cannot work. The TransPort flowmeter is suited for all standard transit-time applications, plus many that would prevent other transit-time flowmeters from working.

Quick and Easy to Use

It's possible to make your first flow measurement within minutes of opening the box — the TransPort flowmeter is that easy to use. Simply input the site parameters, clamp the transducers onto the pipe, adjust the spacing, and you're under way. No ancillary equipment is needed, and there's no need to break into the pipeline. An experienced user can make scores of different measurements in a single day. The TransPort flowmeter is ideal for all kinds of flow survey work.

imagination at work

Flow Transducers and Clamping Fixtures

Using clamp-on transducers, the TransPort flowmeter measures flow rate through metal, plastic or even concrete-lined pipes, without penetrating the pipe wall. From ultrapure water to corrosive and toxic liquids, the TransPort flowmeter assures noncontaminating, leak-free measurement with drift-free accuracy. The TransPort flowmeter has no moving parts to wear or orifices to clog. It can't be fouled, and it rarely requires regular maintenance.

A wide variety of transducers are available with different operating frequencies, materials of construction, operating temperatures and sizes to meet the requirements of rugged industrial environments.

To hold clamp-on transducers in contact with the pipe, a variety of clamping fixtures are available to accommodate different pipe and transducer sizes. These fixtures use a variety of attachment methods including chain, metal strap, Velcro® strap and magnetic fixtures.

Alphanumeric and Graphic Liquid Crystal Display Completes the Picture

A large, multifunction LCD presents measured data in both alphanumeric and graphic forms. In addition, it helps make programming easy by presenting a software menu that walks you through data entry and function selection.

Standard alphanumeric functions include flow velocity, volumetric or energy flow rates, and totalized flow in either English (U.S.) or metric units.

In graphic mode, the LCD shows both real-time and logged data. The result is a chart recording right on the display, which is very useful for reviewing data and observing trends while on the site.

Submersible, Rugged Electronics Housing

Your investment in this flowmeter is protected from the day-to-day rigors of industrial usage. The PT878 is equipped with a rubber boot that provides protection against vibration and shock. The completely sealed housing and ports meet IP67 requirements, so it will withstand submersion in up to 3 ft (1 m) of water for limited periods of time. It will continue to function safely even if it is dropped in water.

Optional Energy Measurement

The TransPort flowmeter combines proven ultrasonic flow measurement with precise RTD temperature measurement to determine the energy flow rate in liquid heating and cooling systems.

With this option, the TransPort flowmeter comes equipped with a built-in power supply for loop-powered RTD temperature sensors, as well as all necessary circuitry and software to make energy flow rate measurements. GE Infrastructure Sensing offers a variety of optional clamp-on and wetted RTD temperature sensors.

Optional Pipe Wall Thickness Gauge Transducer

Pipe wall thickness is a critical parameter used by the TransPort flowmeter for clamp-on flow measurements. The thickness-gauge option allows accurate wall thickness measurement from outside the pipe.

Infrared Port

The PT878 contains an infrared port for communication with your PC. If your laptop or desktop PC does not have infrared capability, an adapter is available that can be plugged into your PC's serial port.

## Optional Infrared Thermal Printer and Accessories

When you need a permanent record of your work, live measurements, logged data and site parameters can be sent to a variety of printers by beaming data directly from the PT878's infrared port. A compact, lightweight, hand-held, infrared thermal printer is available. This printer is powered by a lithium ion battery.
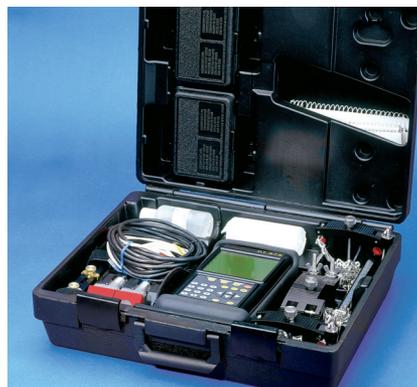
The complete TransPort flowmeter system fits in a compact carrying case.

Built to Be Economical and Stay Economical

To be of real value, a portable flowmeter must be as economical to own and operate as it is capable in the field. The TransPort flowmeter is built to stay in service for many years. Completely solid state, the device rarely wears out or needs servicing, resulting in little downtime and low maintenance costs.
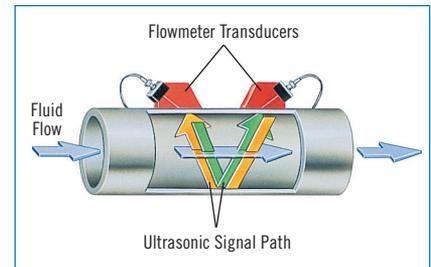
Transit-time flow measurement technique

The TransPort Flowmeter Uses the Transit-Time Flow Measurement Technique

In this method, two transducers serve as both ultrasonic-signal generators and receivers. When mounted on a pipe, they are in acoustic communication with each other, meaning the second transducer can receive ultrasonic signals transmitted by the first transducer and vice versa.

In operation, each transducer functions as a transmitter, generating a certain number of acoustic pulses, and then as a receiver for an identical number of pulses.

The time interval between transmission and reception of the ultrasonic signals is measured in both directions. When the liquid in the pipe is not flowing, the transit-time downstream equals the transit-time upstream. When the liquid is flowing, the transit-time downstream is less than the transit-time upstream.

The difference between the downstream and upstream transit times is proportional to the velocity of the flowing liquid, and its sign indicates the direction of flow.

PT878 Accessories

❶ AC charger

❷ LEMO®-BNC transducer interconnection cable

❸ Input/output cable

❹ IR-to-serial port adapter

❺ Small-pipe transducers

❻ Thickness gauge

❼ C-PT transducers with universal clamping fixture

❽ IR thermal printer

❾ Printer AC power supply

❿ Printer battery charger

Specifications

Operation and Performance

Fluid Types
Acoustically conductive fluids, including most clean liquids, and many liquids with entrained solids or gas bubbles. Maximum void fraction depends on transducer, interrogation carrier frequency, path length and pipe configuration.

Pipe Sizes
0.5 to 300 in. (12.7 mm to 7.6 m) and larger

Pipe Wall Thickness
Up to 3 in. (76.2 mm)

Pipe Materials
All metals and most plastics. Consult GE Infrastructure Sensing for concrete, composite materials, and highly corroded or lined pipes.

Clamp-On Flow Accuracy (Velocity)
- Pipe ID>6 in. (150 mm): ±1% to 2% of reading typical
- Pipe ID≤6 in. (150 mm): ±2% to 5% of reading typical

Note: Accuracy depends on pipe size and whether measurement is one-path or two-path. Accuracy to ±0.5% of reading may be achievable with process calibration.

Repeatability
±0.1% to 0.3% of reading

Range (Bidirectional)
−40 to 40 ft/s (−12.2 to 12.2 m/s)

Rangeability (Overall)
400:1

Note: Specifications assume a fully developed flow profile (typically 10 diameters upstream and 5 diameters downstream of straight pipe run) and flow velocity greater than 1 ft/s (0.3 m/s).

Measurement Parameters
Volumetric flow, totalized flow and flow velocity

Electronics

Flow Measurement
Patented Correlation Transit-Time mode

Enclosure
Submersible IP67

Dimensions
Weight 3 lb (1.36 kg),
size (h × w × d) 9.4 × 5.5 × 1.5 in.
(238 × 138 × 38 mm)

Display
240- × 200-pixel backlit LCD graphic display

Keypad
25-key rubberized tactile membrane keypad

Internal Battery
Rechargeable battery: 9 to 11 hr of continuous operation

Battery Charger Input
100 to 250 VAC, 50/60 Hz, 0.38 A

Memory
FLASH memory, field-upgradable

Operating Temperature
−20° to 55°C (−4° to 131°F)

Storage Temperature
−40° to 70°C (−40° to 158°F)

Note: To ensure maximum battery life, storage temperature exceeding 35°C (95°F) is not recommended for more than one month.

Standard Inputs/Outputs
- One 0/4- to 20-mA current output
- One user-selectable pulse (solid state, 5-V maximum) or frequency (5-V square wave, 100 to 10,000 Hz)
- Two 4- to 20-mA analog inputs with switchable power supply for loop-powered temperature transmitters

Digital Interface
Infrared communication port for printer or PC interface

Site-Parameter Programming
- Menu-driven operator interface using keypad and "soft" function keys
- Online help functions including pipe tables
- Storage for saving site parameters

Data Logging
- Memory capacity to log over 100,000 flow data points
- Keypad programmable for log units, update times, and start and stop time

Display Functions
- Graphic display shows flow in numerical or graphic format
- Displays logged data
- Extensive diagnostic parameters
- Supports multiple languages: Dutch, English, French, German, Italian, Japanese, Portuguese, Russian, Spanish, Swedish and others

European Compliance
Battery-powered system complies with EMC Directive 89/336/EEC and transducers comply with PED 97/23/EC for DN<25

Clamp-On Ultrasonic Flow Transducers

Temperature Ranges

• Standard: –40° to 60°C (–40° to 140°F)

• Optional (overall range): –190° to 300°C (–310° to 572°F)

Mountings

Stainless steel chain or strap, welded or magnetic clamping fixtures

Area Classifications

• Standard: General purpose

• Optional: Weatherproof NEMA 4 IP65

• Optional: Explosion-proof Class I, Div. 1, Groups C,D

• Optional: Flameproof ⟨Ex⟩ II 2 G EEx md IIC T6–T3

• Optional: Submersible

Note: PT878 electronics are designed for general purpose areas.

Transducer Cables

• Standard: One pair of LEMO® coaxial transducer connectors with 25-ft (8-m) cables

• Optional: 1,000-ft (305-m) extension cables available for most transducers

PT878 thickness-gauge option

PanaView software links your TransPort flowmeter to your PC.

Thickness-Gauge Option

Transducer

GE Panametrics dual-element transducer

Pipe-Thickness Range

0.05 to 3 in. (1.3 to 76.2 mm)

Pipe Materials

Most standard metal and plastic pipe materials

Accuracy

±1% typical or ±0.002 in. (±0.05 mm)

Thermal Exposure

Continuous operation to 37°C (100°F); intermittent operation to 260°C (500°F) for 10 sec followed by 2 min air cooling

Energy Measurement

Energy Measurement

Calculates energy flow rate and totalized energy. Requires optional dual-RTD, loop-powered transmitter.

Temperature Transducers

Loop-powered, three-wire platinum RTDs; clamp-on and wetted (thermo-well) types are available

Accuracy

±0.15°C with wetted RTDs (matched pairs)

Range

–20° to 260°C (–4° to 500°F)

Note: The accuracy of the energy measurement is a combination of the accuracy of the associated flow and temperature measurements. 1% to 2% of reading is typical for calibrated systems. Not all extremes of parameters can be achieved simultaneously.

Additional Options

PanaView™ PC-Interface Software

The PT878 communicates with a PC through the infrared interface and Windows® operating systems. Consult the manual for details on sites, logs and other operations with a PC.

Printer

• Infrared, portable, thermal printer with rechargeable battery and 120- to 240-VAC power supply/recharger

• Weight 13 oz (370 g), size 6.3 × 6.5 × 2.3 in. (160 × 164.2 × 59 mm), print width 4 in. (104 mm)

RS232-to-Infrared

Infrared adapter plugs into any available serial port to give desktop PCs infrared capability

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