DONSU TUF-2000B

DONSU TUF-2000B Ultrasonic Flow Meter Instruction Manual

Model: TUF-2000B | Brand: DONSU

1. Introduction

The DONSU TUF-2000B Ultrasonic Flow Meter is a digital, wall-mounted device designed for non-invasive measurement of liquid flow. This meter utilizes ultrasonic technology to accurately determine flow velocity and volume in various pipe materials and sizes without requiring pipe modification or interruption of flow. Its robust design, featuring IP67 protection, ensures reliable performance in diverse industrial environments.

Key features include:

- **Anti-corrosion and Moisture-proof:** IP67/IP68 rated professional-grade protective shell, suitable for long-term outdoor installation.
- **Bi-directional Measurement:** Equipped with a dedicated bi-directional metering chip for accurate forward and reverse flow measurement.
- **Wide Range of Liquids:** Capable of measuring various relatively clear liquids such as water, seawater, oil, and alcohol.
- **Multiple Measurement Methods:** Supports wall mounting (clamp-on), insertion, and inline installation.
- **External Sensor Probe:** Features a built-in magnet for direct pipe attachment and an anti-interference shielding wire for enhanced accuracy.

2. Package Contents

Before proceeding with installation, please verify that all components listed below are present in your package:

- TUF-2000B Host (Main Unit) x1
- TM-1 Ultrasonic Transducers x2
- Steel Belts x2 (for transducer mounting)
- Flow Signal Cables (5 meters) x2

- All necessary accessories for assembly (e.g., heat shrink tubing, terminals, wrench)
- English User Manual x1 (this document)

Figure 2.1: Complete package contents of the DONSU TUF-2000B Ultrasonic Flow Meter. This image displays the main flow meter unit, two ultrasonic transducers, two steel mounting belts, signal cables, and various small assembly accessories including heat shrink tubing, electrical terminals, and an Allen wrench.

3. Setup and Installation

The TUF-2000B supports various installation methods. This section focuses on the common wall-mounted (clamp-on) installation using the provided TM-1 transducers.

3.1 Selecting an Installation Location

- Choose a straight section of pipe that is completely filled with liquid.
- Ensure the pipe surface is clean and free from rust, paint, or debris where the transducers will be mounted.
- Avoid locations near pumps, valves, or other sources of turbulence.

3.2 Transducer Mounting

1. **Prepare the Pipe Surface:** Clean the selected pipe section thoroughly. Remove any loose paint or rust to ensure good acoustic coupling.
2. **Apply Coupling Gel:** Apply a generous amount of the provided coupling gel to the contact surface of both TM-1 ultrasonic transducers. This gel is crucial for efficient ultrasonic signal transmission.
3. **Position Transducers:** Place the two TM-1 transducers on the pipe surface according to the specified distance (refer to the main unit's display or calculation for precise spacing, which depends on pipe diameter and material). Ensure the "UP" and "DN" markings on the transducers align with the direction of flow. The external sensor probes have built-in magnets for temporary attachment.
4. **Secure Transducers:** Use the provided steel belts to firmly secure the transducers to the pipe. Ensure they are tightly fastened to maintain consistent contact with the pipe surface.
5. **Connect Cables:** Connect the flow signal cables from the transducers to the corresponding ports on the TUF-2000B host unit.

Figure 3.1: The DONSU TUF-2000B main unit and transducers installed on a pipe. The image shows the blue main unit mounted on a wall, with cables connecting to two transducers clamped onto a pipe. This illustrates a typical wall-mounted installation.

Figure 3.2: A close-up view of the two TM-1 ultrasonic transducers. These transducers are designed to clamp onto the exterior of a pipe, with clear "UP" and "DN" markings indicating flow direction. They are essential for non-invasive flow measurement.

Figure 3.3: Two steel belts used for securing the ultrasonic transducers to the pipe. These adjustable bands ensure a tight and stable attachment for accurate readings.

Figure 3.4: Various small assembly accessories included with the flow meter, such as heat shrink tubing, electrical terminals, and an Allen wrench. These components assist in securing and protecting electrical connections during installation.

3.3 Power Connection

Connect the power supply (DC8~36V or AC85~264V) to the TUF-2000B host unit. Ensure the power source matches the meter's requirements to prevent damage.

4. Operating Instructions

Once installed and powered on, the TUF-2000B is ready for operation. The main unit features an HD display and a keypad for configuration and data viewing.

4.1 Initial Power-Up and Configuration

1. **Power On:** Apply power to the unit. The HD display will illuminate, and the system will perform a self-check.
2. **Basic Settings:** Use the keypad (numbers 0-9, MENU, ENT, arrow keys) to navigate through the menu. Configure essential parameters such as pipe diameter, pipe material, and liquid type. These settings are

crucial for accurate flow calculations.

3. **Transducer Spacing Verification:** The meter may provide a calculated transducer spacing. Adjust the physical spacing of the transducers on the pipe if necessary to match the recommended value for optimal signal quality.

Figure 4.1: A close-up of the DONSU TUF-2000B main unit, showing its digital display and keypad. The keypad includes numerical buttons, menu navigation, and enter keys for configuring settings and viewing measurement data. The display is backlit for clear reading.

4.2 Reading Measurements

- The display will show real-time flow rate, totalized flow, and other relevant parameters.
- The meter supports bi-directional measurement, indicating both forward and reverse flow.
- Use the arrow keys to cycle through different display modes and view various measurement data.

4.3 Signal Output and Input

- The unit provides 1 way 4-20mA output, 1 way OCT pulse output, and 1 way relay output for integration with control systems.
- It also features 3 way 4-20mA input and an RS485 interface supporting MODBUS for external communication

and data acquisition.

5. Maintenance

Proper maintenance ensures the longevity and accuracy of your DONSU TUF-2000B Ultrasonic Flow Meter.

- **Regular Cleaning:** Periodically clean the main unit and transducer surfaces with a soft, damp cloth. Avoid abrasive cleaners or solvents.
- **Check Connections:** Ensure all cable connections are secure and free from corrosion.
- **Transducer Coupling:** Verify that the transducers maintain good contact with the pipe. Reapply coupling gel if necessary, especially after long periods or if readings become inconsistent.
- **Environmental Protection:** The IP67/IP68 rating provides excellent protection against dust and water. However, avoid submerging the unit or exposing it to extreme conditions beyond its specified operating range.

6. Troubleshooting

This section provides guidance for common issues. For more complex problems, consult a qualified technician or the manufacturer.

- **No Display/Power:**
  - Check the power supply connection and ensure it matches the required voltage (DC8~36V or AC85~264V).
  - Verify that the power outlet is functional.
- **Inaccurate or Erratic Readings:**
  - Ensure transducers are securely mounted and the pipe surface is clean.
  - Reapply coupling gel to the transducers.
  - Verify that the pipe parameters (diameter, material) are correctly entered in the meter's settings.
  - Check for air bubbles or sediment in the liquid, which can interfere with ultrasonic signals.
  - Confirm that the transducer spacing is correct according to the meter's calculation.
- **No Flow Detected:**
  - Confirm there is actual liquid flow in the pipe.
  - Check transducer placement and coupling as described above.
  - Ensure signal cables are properly connected and not damaged.

7. Specifications

Parameter	Specification
Accuracy	≤1%
Host Size (LxWxH)	15.6 x 8.5 x 15 cm (6.14 x 3.35 x 5.9 in)
Velocity Range	0 to ±10 m/s

Parameter	Specification
Pipe Size (Diameter)	DN32 to DN6000mm
Operating Temperature	-30 to 90°C
Measurable Pipe Material	Steel, Stainless Steel, Copper, PVC, Aluminum, Glass Steel, etc.
Signal Output	1 way 4-20mA Output, 1 way OCT Pulse Output, 1 way Relay Output
Signal Input	3 Way 4-20mA Input
Interface	RS485, supports MODBUS
Power Supply	DC8~36V or AC85~264V
Protection Rating	IP67 (Host), IP68 (Transducers)

8. Warranty and Support

Information regarding product warranty and customer support is not available in the provided data. Please refer to the official product packaging, included documentation, or contact DONSU customer service directly for details on warranty coverage, technical assistance, and repair services.

For further assistance, please visit the DONSU Store on Amazon.