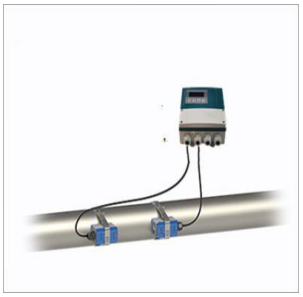


GUF-2000LB Wall Mounted Ultrasonic Flow Meter

1.2 Product Features

★ The flow measurement adopts the time difference correlation method to ensure the measurement accuracy and stability；
★ A high-speed DSP processor, with a response speed of 0.1 seconds；
★ Advanced digital signal processing technology, measurement is not disturbed by impurities such as iron chips and welding slag;
★ Can be connected to different sensors to solve the problem of multiple bubble application on site；
★ Different sensors can be connected to solve the problem of multi-bubble application on site

1.3Technical Indicators

Technical Indicators----GUF-2000LB	
Application	
Measurable liquid	Most single-phase liquids. Less than 5% particles or bubbles.
Pipe material	Stainless steel, carbon steel, PVC, PPR, cement
Ambient temperature	-40℃～+60℃
Measured fluid temperature	-20℃～+150℃
Explosion-proof grade	Flameproof ExidIIBT4
Performance indicators	
Velocity range	Nominal precision flow velocity range 0.1～7.0m/s
Measurement accuracy	±0.5%　　±1.0%
Sensitivity	0.01m/s.
Measurement repeatability	±0.2%

Electronic box	
Degree of protection	IP65
Power supply	AC220V/DC18~27V; low power consumption: DC9~36V/built-in backup battery
Electrical Interface	Waterproof head 4×M20×1.5
LCD Display	128*64 dot matrix LCD screen
Keyboard	4 buttons
Input and output signals	
Serial communication	RS485, MODBUS RTU protocol.
Flow Output	Self-powered 4-20mA output

2、Instrument Installation

1.7 Installation Preparation

Before installing a single/dual channel flow (heat) meter, you should have a comprehensive understanding of the location of the pipeline at the measurement point, pipeline parameters and fluid characteristics . Make a plan for power supply, display information, output signal connection and system maintenance.

The main principle for selecting the installation location of the flow (heat) meter is that there should be a straight pipe at least 10 times the pipe diameter upstream of the installation point, and a straight pipe at least 5 times the pipe diameter downstream of the installation point. In addition, special attention should be paid to keep away from pumps, valves and discharge ports where strong turbulence or air bubbles are likely to occur.

Some suitable and unsuitable piping locations are indicated in Figure 2-1.

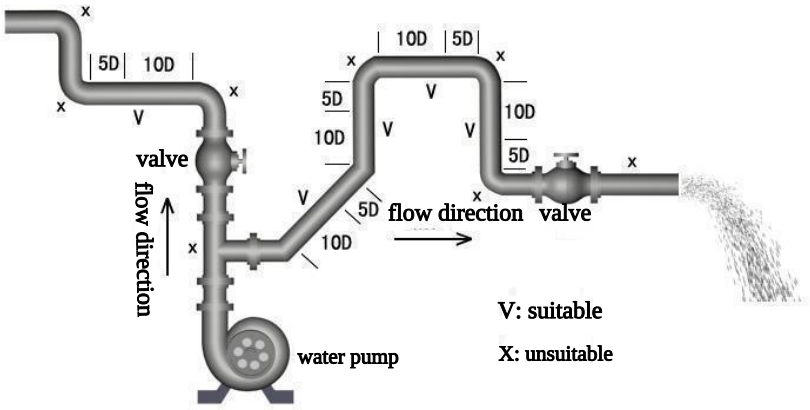


FIGURE 2-1: Selection of installation points for single/dual channel flow (heat) meter sensors

When installing on a horizontal pipeline, try to install the sensor on the horizontal sides of the pipeline, and avoid installing it directly above and at the bottom of the pipeline, as shown in Figure 2-2.
This is because air bubbles sometimes appear on the upper side of the pipe and impurity deposits often form on the bottom of the pipe, both of which will affect the acoustic signal

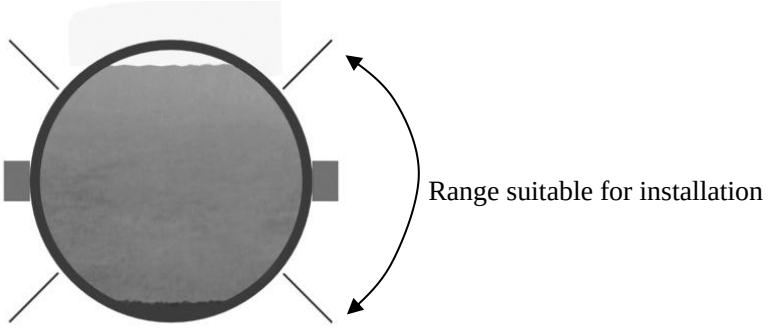


Figure 2-2: Selection of sensor installation points on horizontal pipes.

After determining the installation location and obtaining accurate pipeline and fluid information, it is necessary to use the instrument keyboard to input these information to obtain the installation parameters and calculation parameters of the flow (heat) meter, which is the most important for the clamp-on or flow (heat) meter The parameter is the installation distance of the sensor (obtained by inputting the pipe material, pipe inner diameter, pipe wall thickness, and liquid medium).
For details, please refer to panel operation.

1.8Classification and layout of flow sensors

Single/dual-channel flow (heat) meter sensors are divided into: external clamp type, plug-in type and pipe segment type. The installation method of the sensor can be set according to different application needs.

Generally speaking, external clamp type or plug-in type are recommended.

Z-type installation method, V method is not recommended; if it is a monophonic product, you only need to install the UP1/DN1 pair of sensors in the example shown in the figure.

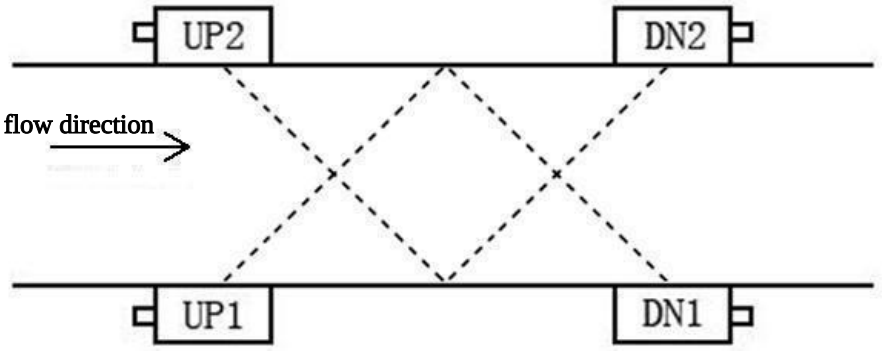


Figure 2-3: Schematic diagram of the V-type installation of the clamp-on flow (heat) meter sensor

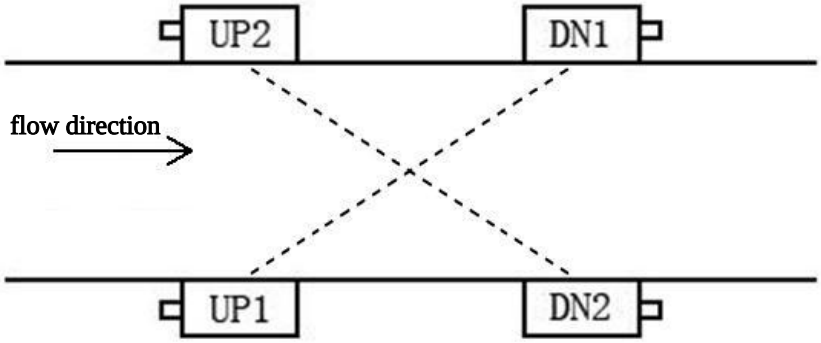


Figure 2-4: Z-type installation schematic diagram of clamp-on flow (heat) meter sensor

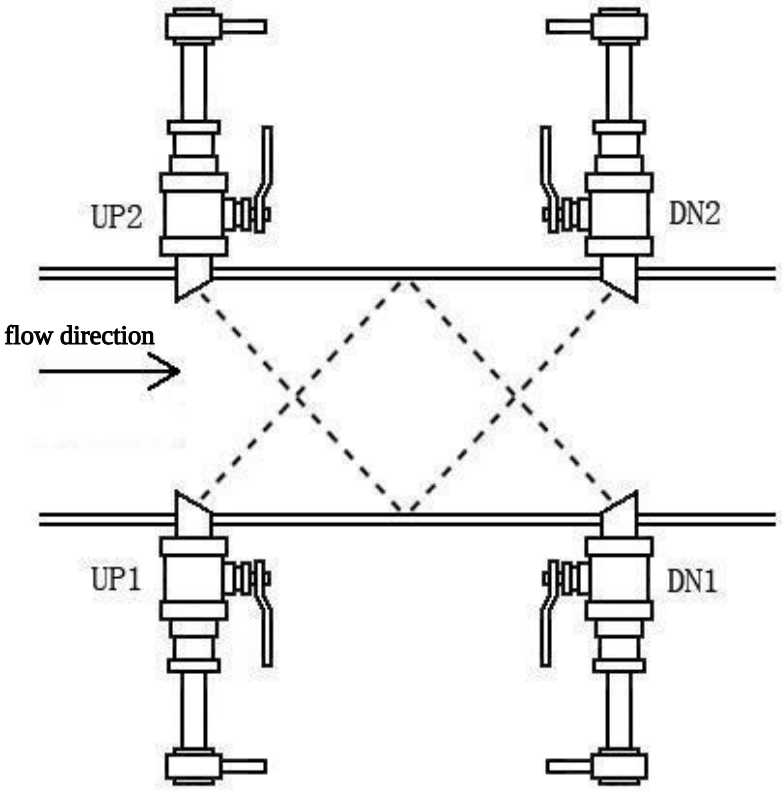


图2-5：Figure 2-5: V-type installation diagram of plug-in flow (heat) meter sensor

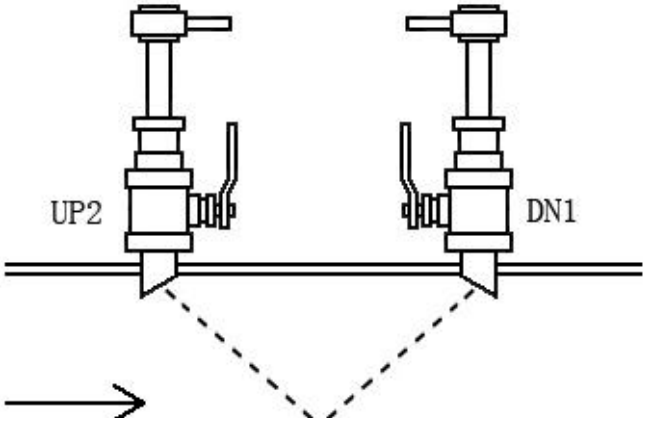


Figure 2-7-1: Schematic diagram of parallel installation of plug-in flow (heat)meter sensor

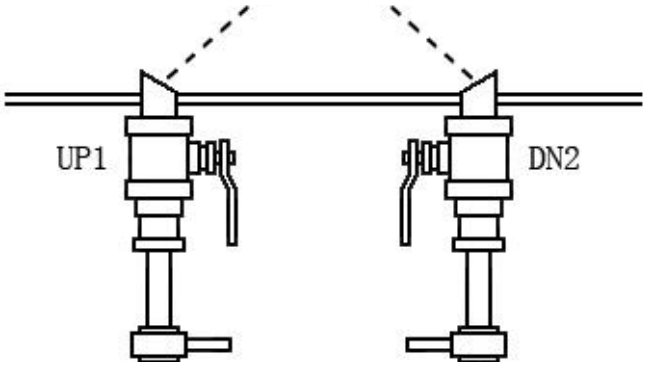


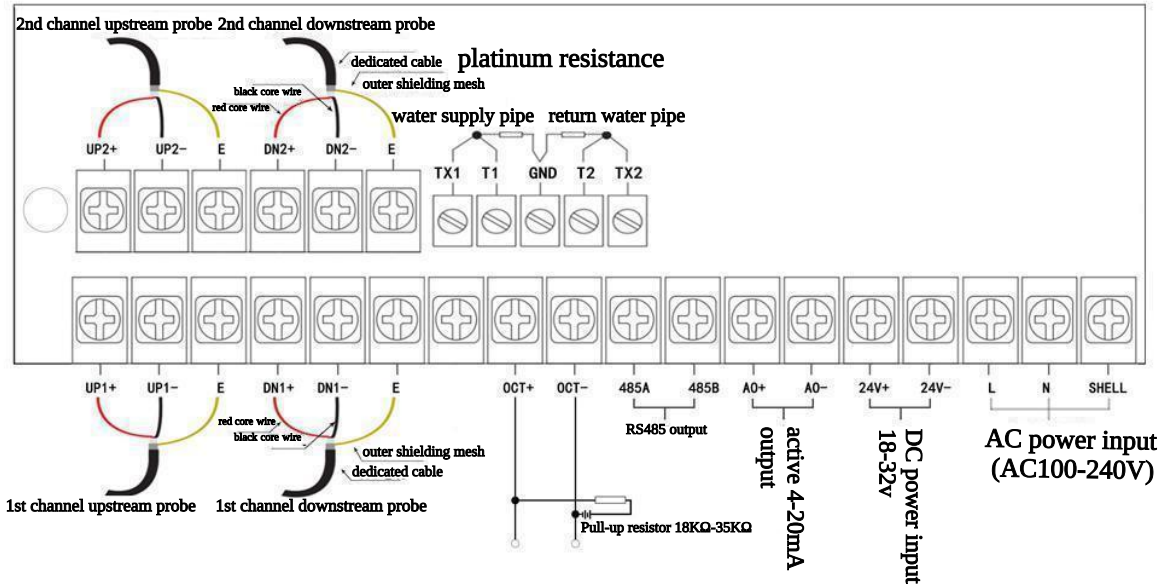
Figure 2-6: Z-type installation diagram of plug-in flow (heat) meter sensor

1.9 Separate Electrical Wiring

The user should pay special attention to the power supply type of the flow (heat) meter when wiring.

In order to ensure the normal operation of the transmitter, the following aspects should be paid attention to when wiring: ensure that the power supply connection is consistent with the display specifications on the transmitter nameplate.

The flow (heat) meter is installed in the designated position according to the requirements, and then the wiring can be started. Open the back cover of the transmitter, and the interface label of the transmitter can be seen. For the specific wiring, please refer to the figure below.



3、Panel Operation

The operation panel can be used to check the calculation process, accumulate zeros, change settings, etc.

1.10 Panel composition

The operation panel consists of a 4-key keyboard.

The keyboard consists of 4 keys:

- ▼ : the menu directory viewing, scrolling, number change keys
- ▶: Array shift key, the corresponding digit will flash
- : Mode selection key, exit key, referred to as MD key
- : OK key (Enter key/ ENTkey), after pressing the OK key for optional items, will appear">", you can use the ▼ key input the corresponding data, press OK again, and the ">" disappears, which means it has been input.

1.11 Menu

Menu Operation:

Press the MD key to select the corresponding menu, press the ENT key to enter the mode selection key, there are 5 mode menus in total, use the ▼ key to select the desired setting menu, and press the ENT key to enter the corresponding sub-item, as follows:

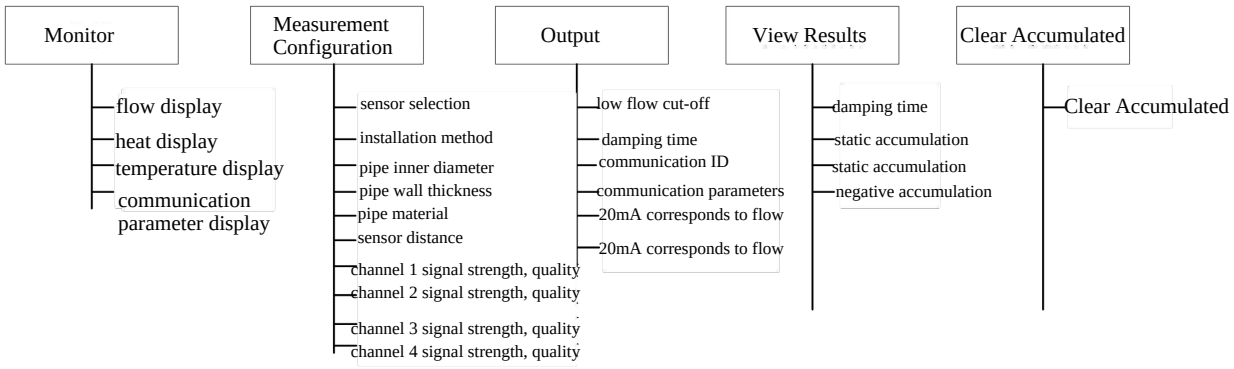


Figure 2-1 Separate panel diagram

1.12 Menu Analysis

1.12.1 Monitoring

The monitoring screen displays several main measurement results of the flow (heat) meter, and the specific screen can be selected by pressing the ▼

The first screen shows the **instantaneous flow** and **total cumulative quantity** as shown in Figure 3-3-·, and the second screen shows the measured **instantaneous heat** and **cumulative heat** when it is used as a meter, as shown in Figure 3-3-2. The third panel is used as a meter to display the measured **supply water temperature** and return **water temperature** as shown in Figure 3-3-3.

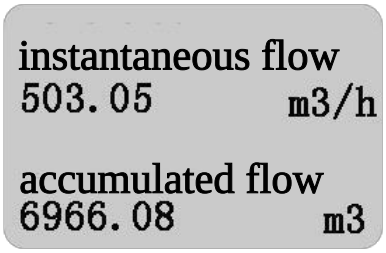


Figure 3-3-1 Flow Screen

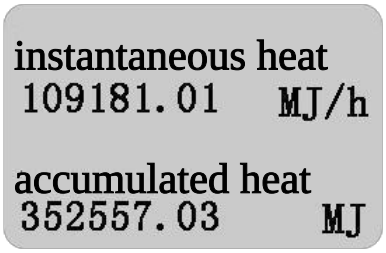


Figure 3-3-2 Thermal screen

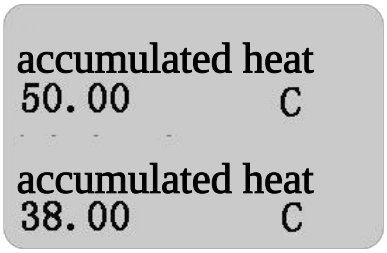


Figure 3-3-2 Temperature screen

1.12.2 Measurement configuration

The measurement configuration is mainly the most basic information necessary for setting the measurement. If the input information is inaccurate, it may cause the flow (heat) meter to fail to measure. The above parameters are used as pipe-type flow (heat) calorimeters, which have been set before leaving the factory, and there is no need for customers to set them again. Changing the parameters without authorization will cause various incalculable consequences.) meter, each parameter needs to be set according to the actual situation.

Inner diameter: The inner diameter of the measured pipe is in millimeters (mm)

Wall thickness：The thickness of the pipe wall to be measured, in millimeters (mm).
Pipe material: The material of the pipe to be measured, generally common materials such as **stainless steel, carbon steel, PVC, cast iron** can be directly selected, other materials need to check the attached table (see the end) or contact the manufacturer to determine the propagation speed of the sound wave in the material, the external clamp flow (Heat) calorimeters need to set this parameter, other flow (calorie) meters do not.
Installation method: Mainly set the layout of the sensor, the actual installation of the sensor needs to be consi stent with this parameter.
Installation distance: According to the above settings, the installation distance of the sensor will be finally obtained, and the unit is millimeter (mm). The actual installation distance between the sensors should be consistent with this parameter.

1.12.3 Out put

The "Output" menu contains settings for outputting various parameters, the specific parameters are as follows:
Damping coefficient：set the response speed of the instantaneous flow, the maximum value is 200, the larger the value, the more stable the instantaneous flow and the slower the response, the smaller the value, the greater the instantaneous flow fluctuation, but at the same time the faster the response.
Low flow rate cut-off: Set the minimum flow rate that the flow (heat) meter can measure. The factory is g enerally 0.03m/s. If the measured value is lower than this value, it will be treated as zero flow.
Communication ID: Set the address number of the flow (heat) meter for modbusRTU communication, the factory default is 1.
Communication parameters: set the flow (heat) meter RS485 communication rate, parity bit, stop bit, etc.
20mA corresponding flow: set 4~20mA output, the instantaneous flow value corresponding to 20mA.
OCT pulse equivalent: output a positive cumulative flowmeter represented by a pulse, up to 10,000 pulses can be output in 1 second. The flowmeter will automatically calculate the oct output frequency according to the device

1.12.4View results

Instantaneous flow: The flow (heat) meter measurement results show that it is the result of the comprehensive calculation of the two-channel flow.

Cumulative flow: The cumulative flow in the positive and negative directions of the flow (heat) meter.

Positive cumulative: The cumulative flow in the positive direction of the flow (heat) meter.

Negative cumulative: The flow (heat) meter in the negative direction of the flow (heat) meter. When installing, the direction of the arrow on the flow (heat) meter should be consistent with the actual liquid flow direction. The flow direction opposite to the arrow is the negative flow. Accumulation is negative accumulation. When leaving the factory, the default setting can only measure a small negative flow range.

Channel 1 signal quality: channel 1 sensor timetransmission ratio T and quality Q
Channel 1 signal strength: channel 1 sensor upstream and downstream signal strength
Channel 2 signal quality: channel 2 sensor timetransmission ratio T and quality Q
Channel 2 signal strength: channel 2 sensor upstream and downstream signal strength
Channel 3 signal quality: channel 2 sensor timetransmission ratio T and quality Q
Channel 3 signal strength: channel 2 sensor upstream and downstream signal strength
Channel 4 signal quality: channel 2 sensor timetransmission ratio T and quality Q
Channel 4 signal strength: channel 2 sensor upstream and downstream signal strength

1.12.5 Clear accumulation

Confirmation: Press the Ent key to clear all accumulated flow, please contact the factory personnel for the required password.

1.13 Quickly input pipeline parameters and steps

1>Measurement configuration->sensor selection->select the corresponding sensor

2>Measurement Configuration->Installation Method->Select the corresponding installation method (if it is a plug-in sensor or a pipe-integrated sensor, there is no item)

3>Measuring Configuration->Pipe Inner Diameter->Input the corresponding inner diameter (if it is a pipe segment that has been stored, there is no item)

4>Measurement Configuration->Pipe Inner Diameter->Pipe Wall Thickness (If it is an integrated pipe segment or a plug-in sensor, this item will not be available)

5>Measurement Configuration->Pipe Material->Pipe Thickness (If it is an integrated pipe segment or a plug-in sensor, this item will not be available)

6>Measurement configuration->sensor installation distance, the recommended sensor installation distance, if it is a stored sensor, there is no such item

7>Measurement configuration->channel 1, 2 signal strength, quality

8>Measurement configuration->channel 3, 4 signal strength, quality

4. How to use

1.14 Judging whether the flowmeter is working normally

>Check measurement configuration->Signal strength and quality of channel1: It is recommended that Q>80, 97%<T<103%, the upstream and downstream are greater than 10mV and the difference between the upstream and downstream is not more than 5%

> Channel 2 is viewed in a similar way to channel 1

1.15 How to use zero point cut to avoid invalid accumulation

The data of "Output->Low flow cutoff" is called the low flow cutoff value, and the system regards the flow rate whose absolute value is lower than this value as "0". In this way, this parameter can be set to avoid false accumulation of measurement errors generated by the flowmeter when the real flow rate is "0".

Generally, set this parameter to 0.03m/s.

When the flow rate is greater than the flow rate indicated by the low flow cutoff value, the low flow cut off value has nothing to do with the measurement results and will never affect the measurement results.

1.16 How to use 4~20mA current loop output

The current loop output accuracy of the current (heat) meter is better than 0.1%, the flow value corresponding to 4mA is 0m3/h, and the corresponding flow value of 20mA is adjusted to "output -> flow value corresponding to 20mA"; for example, if it is set to 80m3/h, the output The flow meter corresponding to 4~20 mA is 0~80m3/h.

1.17 How to use RS485 serial port

The flow (heat) meter uses the standard ModbusRTU communication protocol, and its device address can be set between 1 and 254 by software, and its baud rate can be selected between 1200 and 57600, and the low-power flow meter supports up to 9600.

>Output->Comm ID: Used to set the ModbusRTU address.
>Output->Communication parameters: used to set serial communication baud rate, parity bit, etc.

5. Water temperature and speed of sound meter

Tem (℃)	Voc (m/s)	Tem (℃)	Voc (m/s)
0	1403	50	1541
5	1427	55	1546.5
10	1447	60	1552
15	1464	65	1553.5
20	1481	70	1555
25	1494	75	1555
30	1507	80	1555
35	1516.5	85	1552.5
40	1526	90	1550
45	1533.5	95	1547
		100	1543

Note: The viscosity of water is 1.13cSt