➤ Current Velocity meter

Ⅰ. HT-A type portable current velocity meter

1.Introduction

HT type portable velocity flow meter (Portable velocity apparatus) is an equipment used in water conservancy for velocity flow measurement, designed for hydrological stations, mining factories, environmental monitoring stations, farm irrigation, hydrogeology and so on.Portable velocity flow meter is composed of LS1206B spin paddle velocity sensor (or other type spin cup and screw propeller velocity apparatus), velocity measuring instrument and 0.4 m x 4 Φ 16 measuring bar. Full set of instruments are in the aluminum-alloy password boxes. When using, you can assemble it as a body and connect the signal line, then the velocity of every open channel can be measured. And it can automatically display the velocity and preset the flow of sectional areas.

The instrument is light and convenient with simple structure. It has low power consumption, complete function, high automation degree, stability and reliability, which complies with the

national measurement standards. It is the new portable velocity measuring instrument in China.

2.Main Technical Parameter

- Speed Formula: $V = \frac{KN}{T} + C(m/s)$ (Automatic calculation)
- Speed Range: 0.05-7.00 m/s
- Measuring Error: Less than 1.5%
- Screen: 2 x 16 liquid crystal display
- Measuring Method: Positioning measuring bar or suspended cable
- emperature Range: -10℃-45℃
- Power Supply: DC5V

2.Measuring principles:

This instrument is designed based on the theory of areas of open channel's velocity. After measuring the velocity, the flow can be get: Q = V•S (S is sectional area)

(1).Velocity Measurement

When measuring velocity, the spin paddle type rotor flow meter will be pushed by waterpower. The built-in signal apparatus produces RPM signal. The formula below can calculate velocity:

$$V = \frac{(k/b)N}{T} + C/a(m/s)$$

V: The average velocity (m/s)
B/K: The waterpower pitch of blades
C / a: Velocity constant
T: Lasting time (the unit is s)
N: The number of signals in T time
K/b and C/a are constants

When measuring, you can set T and then measure N, so the velocity and flow can be automatically calculated.

Ⅱ.HT-B type portable current velocity meter

1.Introduction

HT portable velocity flow meter (portable velocity apparatus) is an equipment used in water conservancy for velocity flow measurement, designed for hydrological stations, mining factories, environmental monitor
ing stations, farm irrigation, hydrogeology and so on.

Portable velocity flow meter is composed of LS1206B spin paddle velocity sensor (or other type spin cup and screw propeller velocity apparatus), velocity measuring instrument and 0.4 m x 4 Φ 16 measuring bar. Full set of instruments are in the aluminum-alloy password boxes. When using, you can assemble it as a body and connect the signal line, then the velocity of every open channel can be measured. And it can automatically display the velocity and preset the flow of sectional areas.

The instrument is light and convenient with simple structure. It has low power consumption, complete function, high automation degree, stability and reliability, which complies with the national measurement standards. It is the new portable velocity measuring instrument in China.

2.Main Technical Parameter

- Diameter: Φ60mm
- Pitch of Screw: H=120mm
- Instruments' Starting Speed: V0≤0.06m/s
- Measuring Speed Range: 0.05-7m/s
- Verification Precision: Formula average variance m≤±1.2%
- When V<0.2m/s, relative errorδ≤±5%
- Signal Frequency: Two signals every time
- Continuous Working Hours: 24h
- Screen: 2 x 16 liquid crystal display
- Measuring Method: Positioning measuring bar or suspended cable
- Temperature Range:-10℃-45℃
- Communication: RS232
- Instrument Calculation: Automatic calculation
- Data Storage: 99 articles:
- Power Supply: DC5V (four section #5 nimh battery), working for 40 hours or more after full electricity

3.Principles:

This instrument is designed based on the theory of areas of open channel's velocity. After measuring the velocity, the flow can be get: Q = V•S (S is sectional area)

(1).Velocity measurement:

When measuring velocity, the spin paddle type rotor flow meter will be pushed by waterpower. The built-in signal apparatus produces RPM signal. The formula below can calculate velocity:

$$V = \frac{(k/b)N}{T} + C/a(m/s)$$

V: The average velocity (m/s)
B/K: The waterpower pitch of blades
C / a: Velocity constant
T: Lasting time (the unit is s)
N: The number of signals in T time
S: Sectional area
Q: Flow
K/b and C/a are constants

When measuring, you can set T and then measure N, so the velocity and flow can be automatically calculated.

(2)Flow calculation:

The measurement of velocity is based on the theory of areas of open channel's velocity. First, you can measure velocity, and then multiply sectional area, so the flow can be gotten. HT-B instrument can automatically calculate the flow. At the same time, it can store 99 articles measured data.

➤ Current meter

Ⅰ. LS20B propeller type current meter

1.Introduction

LS20B propeller flowmeter had passed the technical appraisement of the Ministry of Water Resources of the People's Republic of China in 1986 and its performance had reached international advanced level of similar products. This product was awarded the Third Prize of Science and Technology Progress by the Ministry of Water Resources of the People's Republic of China in 1988 and was honored as China state level new product in 1990. In 1993, it participated in the international flowmeter test which was organized by United States Geological Survey (USGS) and its superb performance was well praised by American experts when compared with world fam-

ous brands such as America Price AA,Germany OttC-3,Britain Valeport BFM002 and so on.

2.Application

LS20B type propeller flowmeter is a kind of large-range hydrological flowmeter, which is applicable to measure high, medium, and low flow rate of rivers, lakes, channels, reservoirs and so on. It can also be used for measuring high speed or ultrahigh speed flow rate in pressure pipe of power station and some scientific experiment.

3.Features

- Especially extensive speed measurement range, one propeller can satisfy different measurement requirements.
- Fine sealing performance makes regular work in operational condition of high speed and high sediment concentration possible. (Highest measurement speed: 4.3m/s, highest sediment concentration 100kg/m³)
- The propeller adopts imported high quality engineering plastics, which is of high impulse strength, stable geometry,and aging resistance. The docimasy coefficient K won't change in harsh natural condition environment.
- Low-speed performance—internal friction characteristic.
- Flexible installment manner and reasonable directional device structure can adapt direction of current.
- Fine structure intensity makes installment and support firm and can stand 15m/s high flow rate impact.
- Streamline overall and built-in type empennage counter weight reduces water resistance. No additional deflection moment.

4.Main Technical Parameter

- Speed Range: 0.05 ~ 15m/s
- Propeller Tactical Diameter: ϕ120mm
- Propeller Water Power Pitch: 200mm
- Output Signal Frequency: 2 signal/rotate
- Verification Formula Relative Error: V≥VK, < 1.5%; V<VK, < ±5%

Ⅱ、LS1206B Propeller Flowmeter

1.Introduction

The LS206B type propeller flow meter is used to measure mean flow rate of scheduled testing point.

This instrument has the following advantages: small volume, light mould, compact form and convenient to use. It is applicable to investigate water resource, perform runoff experiment and use in irrigation ditch, small and big rivers. Meanwhile it is widely used to test pipe flow measurement efficiency of small and medium-sized mercury station, efficiency experiment of hydraulic machinery, and sewerage monitoring.

As a CBL-1 mercury station flowmeter, this instrument is identified by the Ministry of Water Resources of the People's Republic of China in 1983. It is approved that this instrument is applicable to measure flow rate of medium and small single mercury station. It is of easy installation and operation, stable performance, reliable operation and the precision complies iwith grade C precision in the international standard ISO-2548-73 Flow Rate Test. It is deemed that this instrument is small nvested and high yielded after being adopted by users nationwide.In 1983, this instrument is awarded the fourth prize of scientific and technological progress by the Ministry of Water Resources of the People's Republic of China.

This instrument is widely used in small channel flow measurement in field irrigation. It can work normally in irrigation area of 20kg/m³ sediment concentration because of its fine spindle dynamic sealing.

When modified slightly in installation structure, this instrument can be applied in ship speed measurement.

2.Main Technical Parameter

- Propeller Tactical Diameter: ϕ60mm
- Propeller Water Power Pitch: H=120mm
- Run-up Speed: V0≤0.05m/s
- Velocity Range: 0.05~7m/s
- Depth: 40m
- Wade Measurement Manner: Measuring bar
- CG16-1 Type Measuring Bar: ϕ16mm×1.6m
- Pipe Flow Measurement Installation: Interior support type exclusive measuring bar
- Signal Frequency: 2 signal/rotate
- Ambient Water Temperature: 0~35℃
- Continuous Working Time: 24h
- Verification Formula Mean-Square Deviation: m≤1.2%, V < 0.2m/s
- Relative Error: δ≤±5%