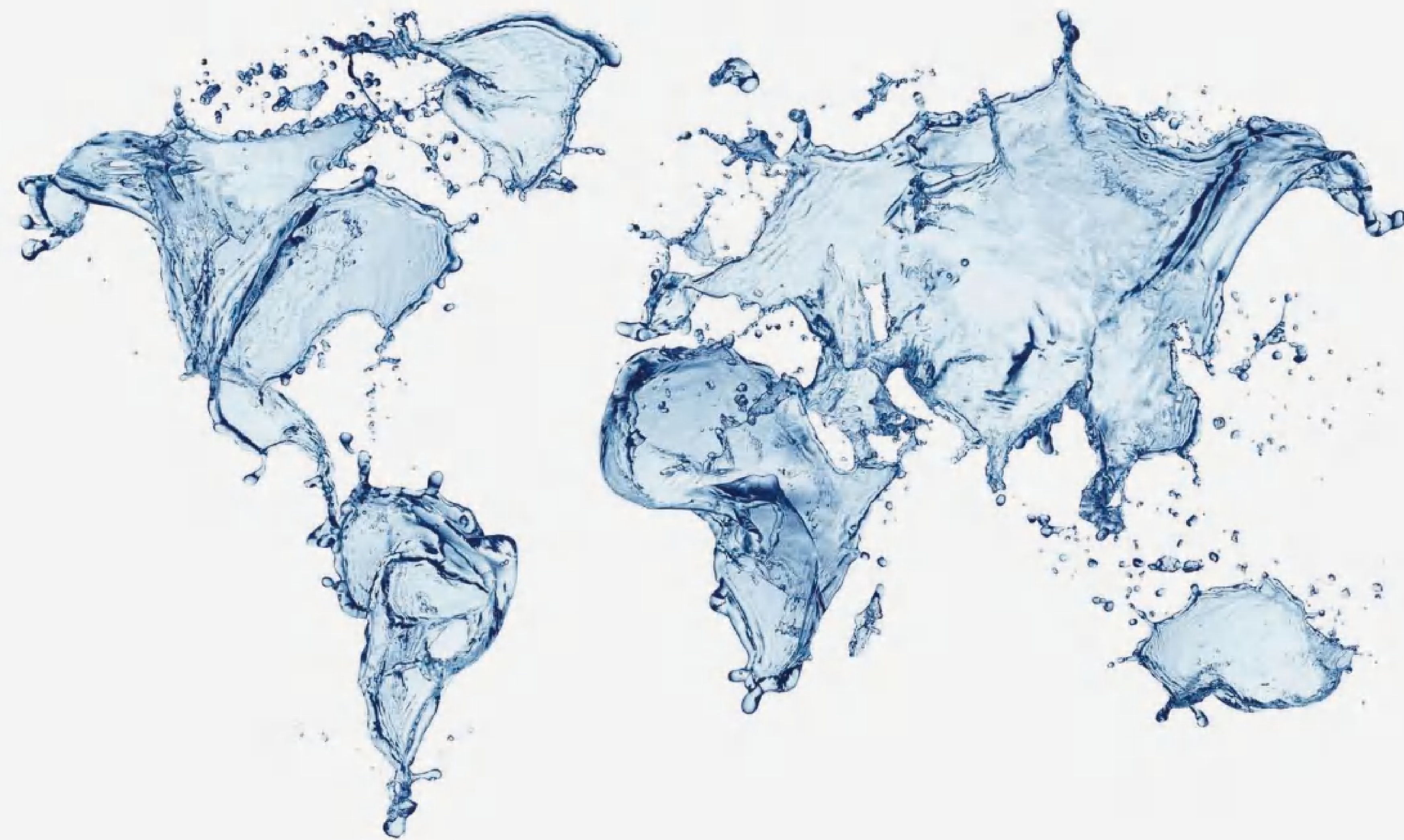


Lanry

Professional Manufacturer of Flowmeters



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- Transit-time Ultrasonic Flowmeter
- Doppler Ultrasonic Flowmeter
- Partially Filled Pipe & Open Channel Flowmeter



COMPANY

Lanry Instruments is the professional manufacturer of flow measure instruments, provides one package service of research and development, production, marketing and after-sales services. Engaged in the production of flow meters more than 20 years, Lanry has been equipped with advanced design capabilities and piled up a wealth of field application experience, which lays a solid foundation for the commitment to the promotion and innovation of high-tech system solution. The corporation has devoted to the production of flow measurement instruments with superior performance, high stability and strong reliability. Currently, Lanry Instruments has developed into two branches as Lanry Instruments (Shanghai) Co., Ltd. and Lanry instruments (Dalian) Co., Ltd, which are responsible for different areas and applications.

Adhering to the "high-quality, high efficiency" business principles, Lanry instruments takes quality as its life. Sticking to the "integrity, innovation, win-win" development principles, we do sincere business and sets sights on technology innovation. Therefore, it is believed that with the top-class product quality, first-class business management and first-ranking customer service, the corporation is supposed to cooperate sincerely, develop mutually and then create brilliance together with domestic and foreign customers!



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General:

TF1100 Transit-time Ultrasonic Flowmeter works on the transit-time method.

The clamp-on ultrasonic transducers (sensors) are mounted on the external surface of the pipe for non-invasive and non-intrusive flow measurement of liquid in fully filled pipe. Two pairs of transducers are sufficient to cover the most common pipe diameter ranges. In addition, its optional thermal energy measurement capability makes it possible to carry out a complete analysis of thermal energy usage in any facility.

The Insertion ultrasonic transducers (sensors) is hot-tapped mounting, there is no ultrasonic compound and coupling problem; Even though the transducers are inserted into pipe wall, they do not intrude into the flow, thus, do not generate disturbance or pressure drop to the flow. The insertion (wetted) type has the advantage of long-term stability and better accuracy.

This flexible and easy to use flow meter is the ideal tool for the support of service and maintenance activities. It can also be used for the control or even for the temporary replacement of permanently installed meters.

Applications:

General

- Service and maintenance
- Replacement of defective devices
- Support of commissioning process and installation
- Performance and efficiency measurement
 - Evaluation and assessments
 - Capacity measurement of pumps
 - Monitoring of regulating valves
- Energy efficiency audits

- Water and waste water industry** – hot water, cooling water, potable water, sea water, etc
- Petrochemical industry**
- Chemical industry** –chlorine, alcohol, acids, thermal oils, etc
- Refrigeration and air conditioning systems**
- Food, beverage and pharmaceutical industry**
- Power supply**– nuclear power plants, thermal & hydro-power plants, heat energy boiler feed water, etc
- Metallurgy & mining applications**
- Mechanical engineering and plant engineering**– pipeline leak detection, inspection, tracking and collection.



Water & Waste Water

HVAC

Building

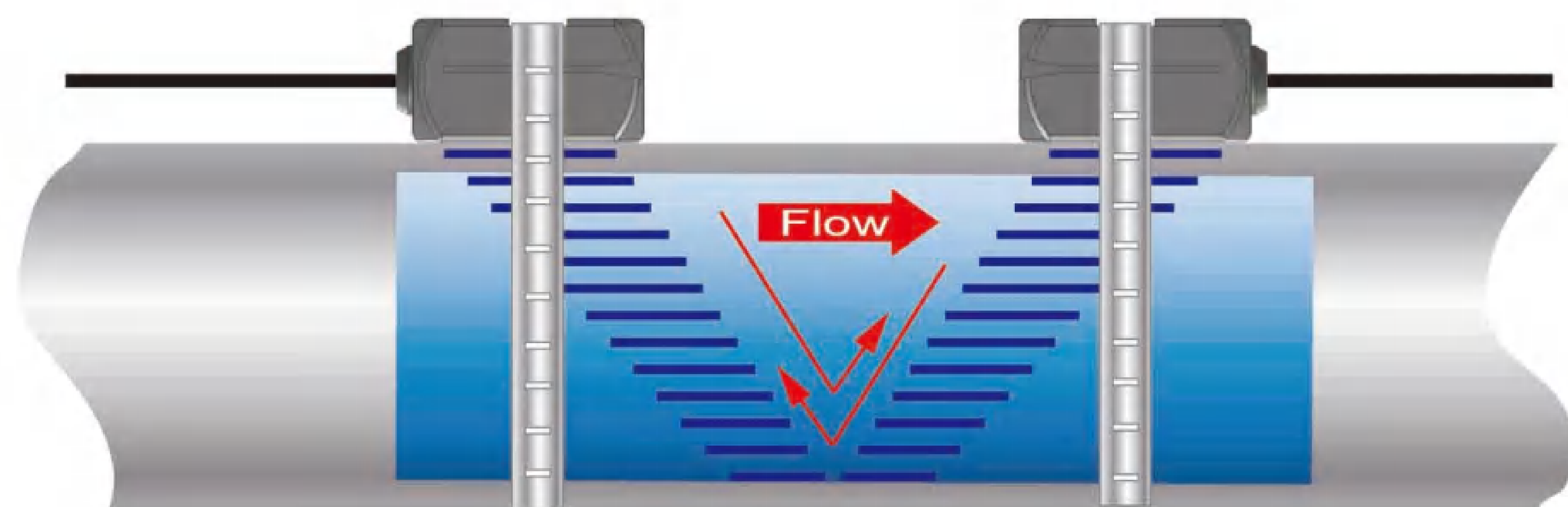
Petrochemical Industry

Metallurgy & Mining

Principle of Measurement:

The Transit Time Difference Correlation Principle makes use of the fact that the time-of-flight of an ultrasonic signal is affected by the flow velocity of the carrier medium. Like a swimmer working his way across a flowing river, an ultrasonic signal travels slower upstream than downstream.

Our TF1100 ultrasonic flow meters work according to this transit-time principle:



$$V_f = Kdt / TL$$

Where:

V:Flow velocity

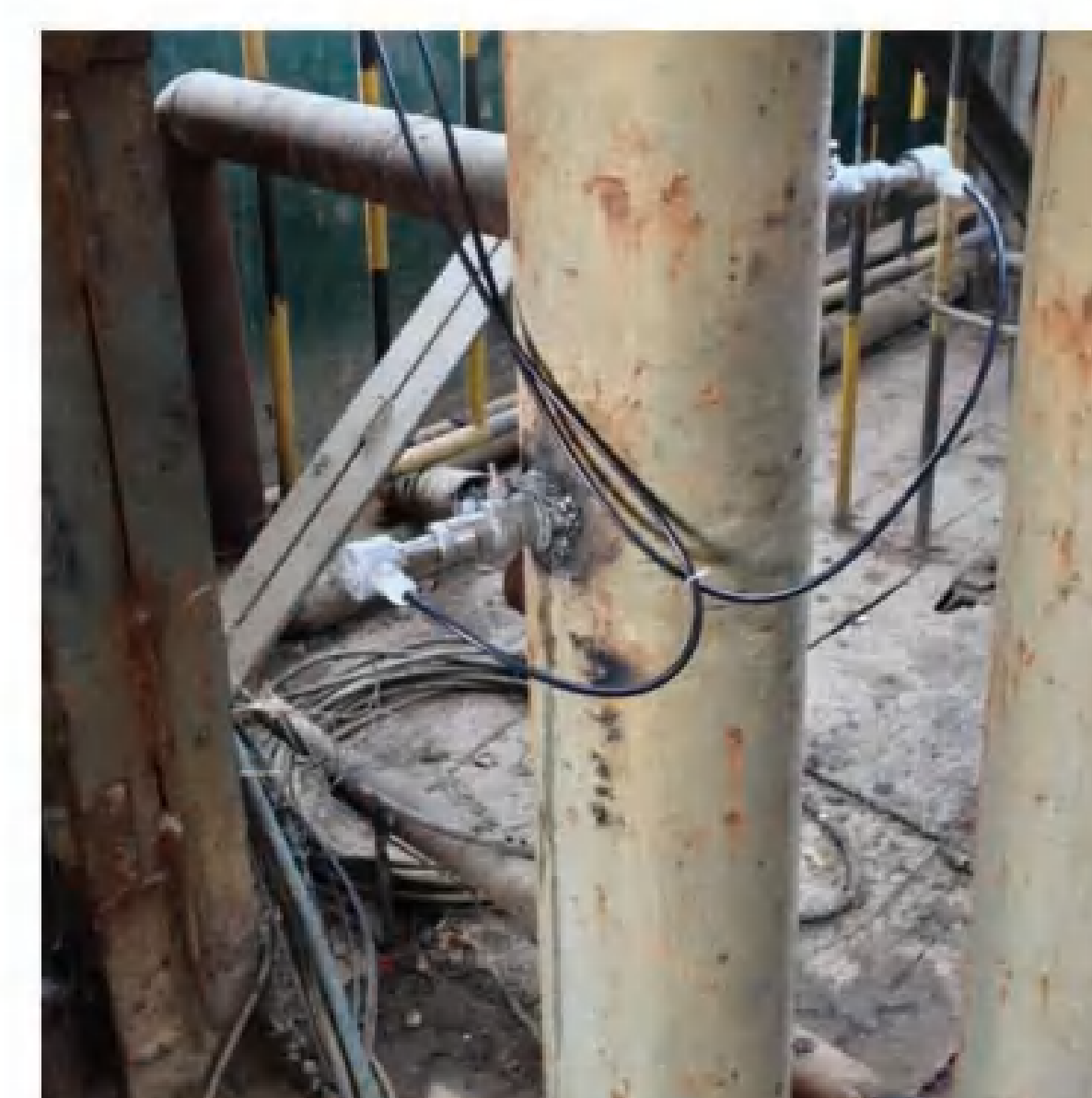
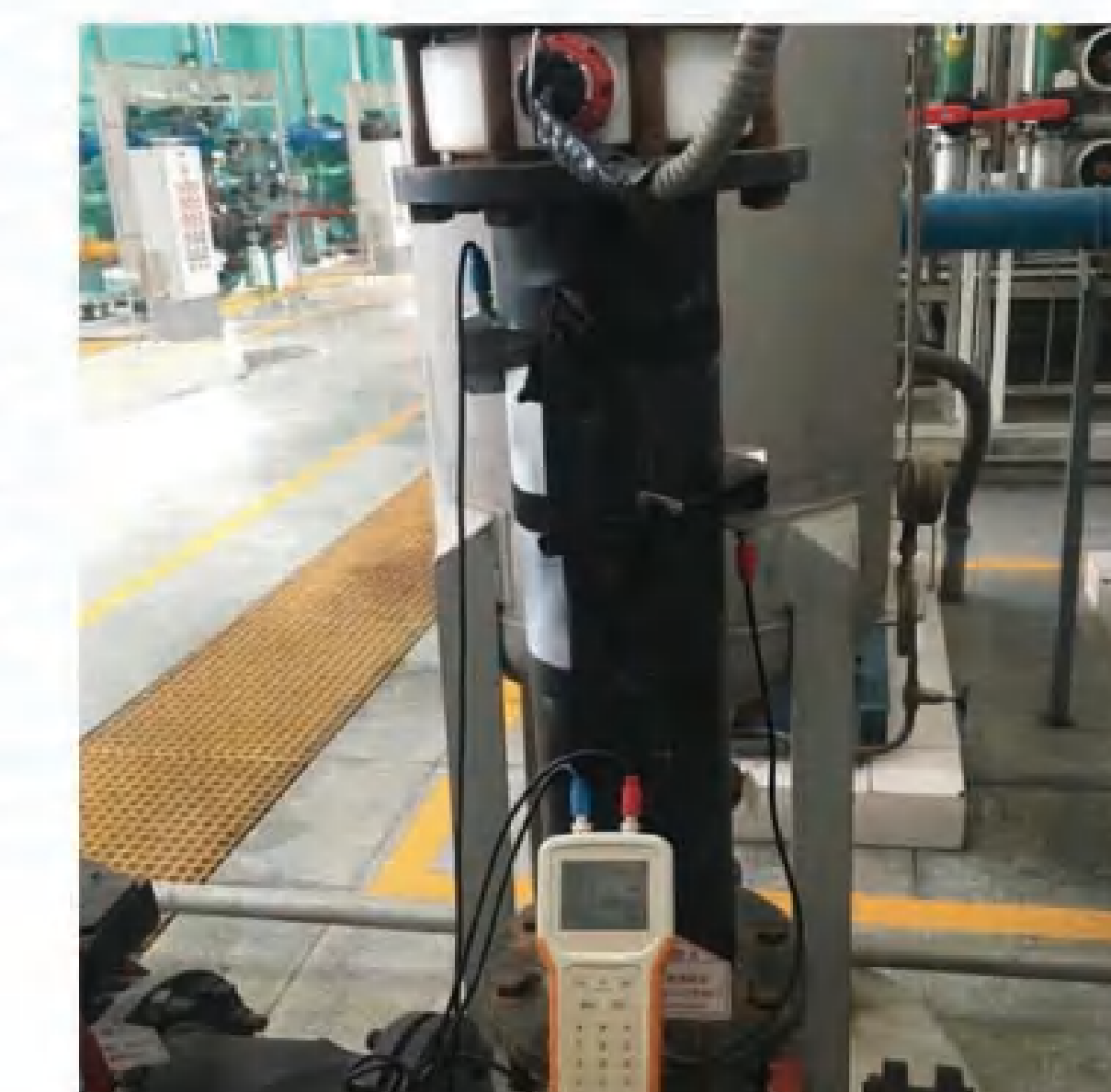
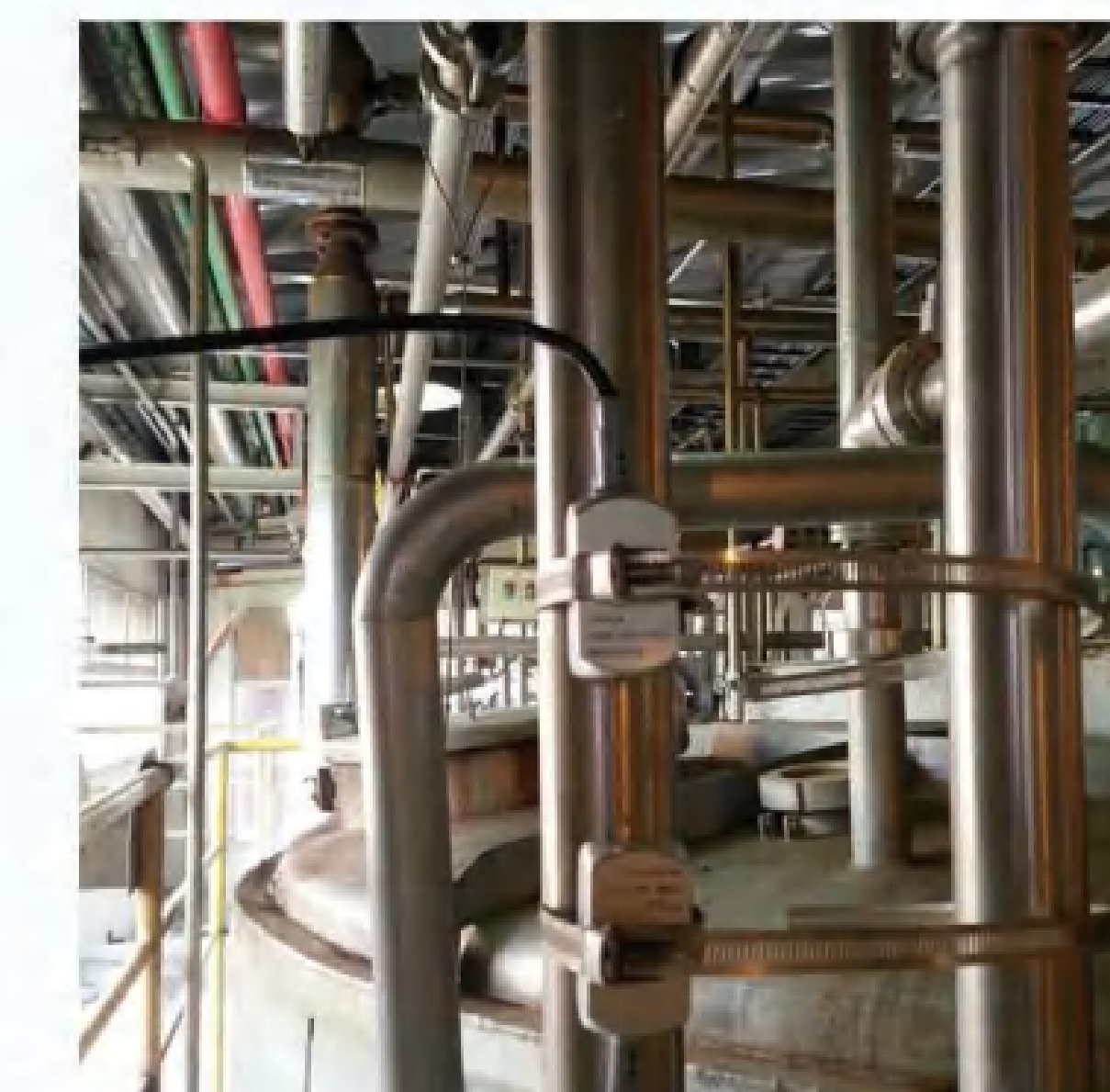
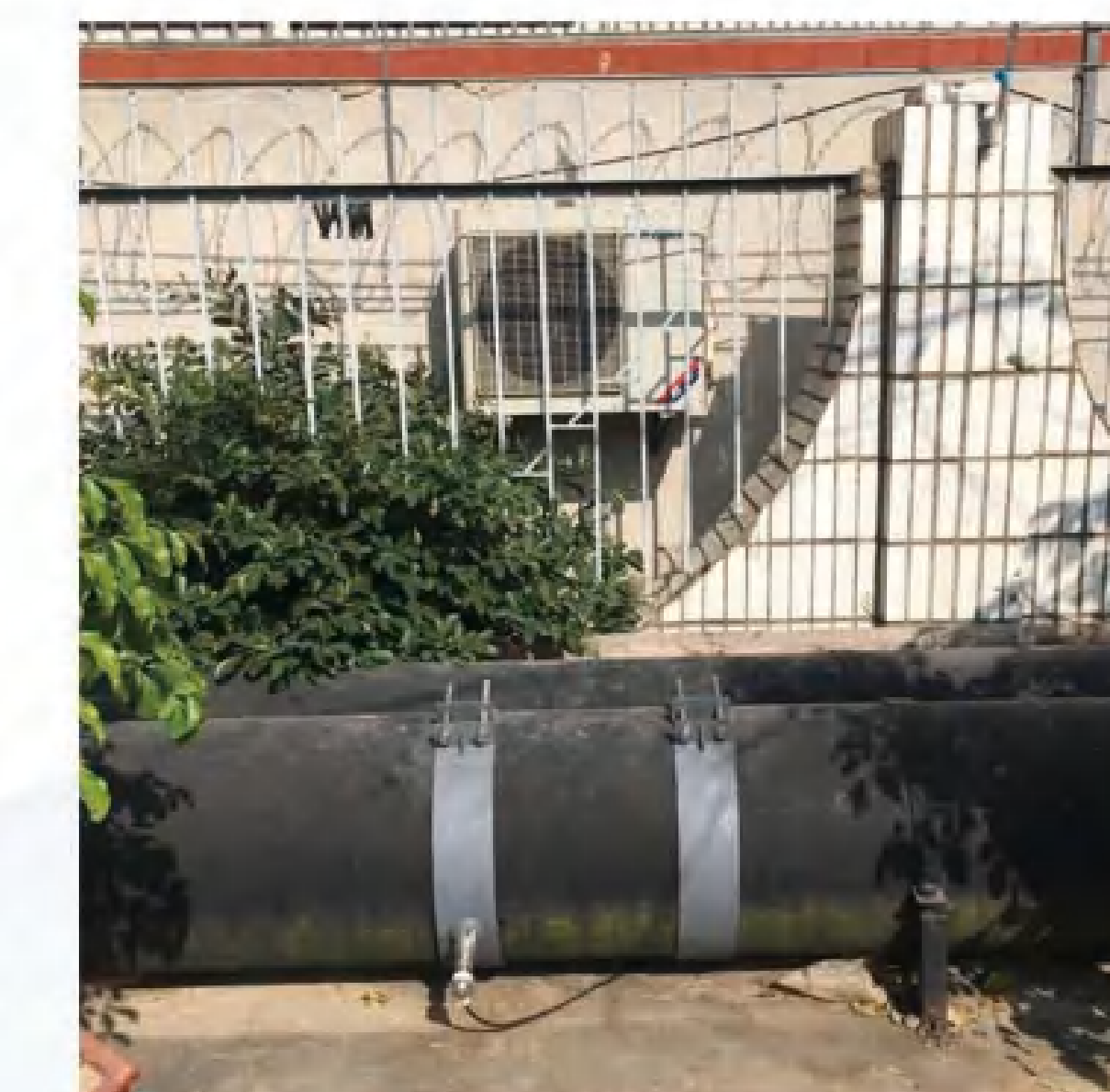
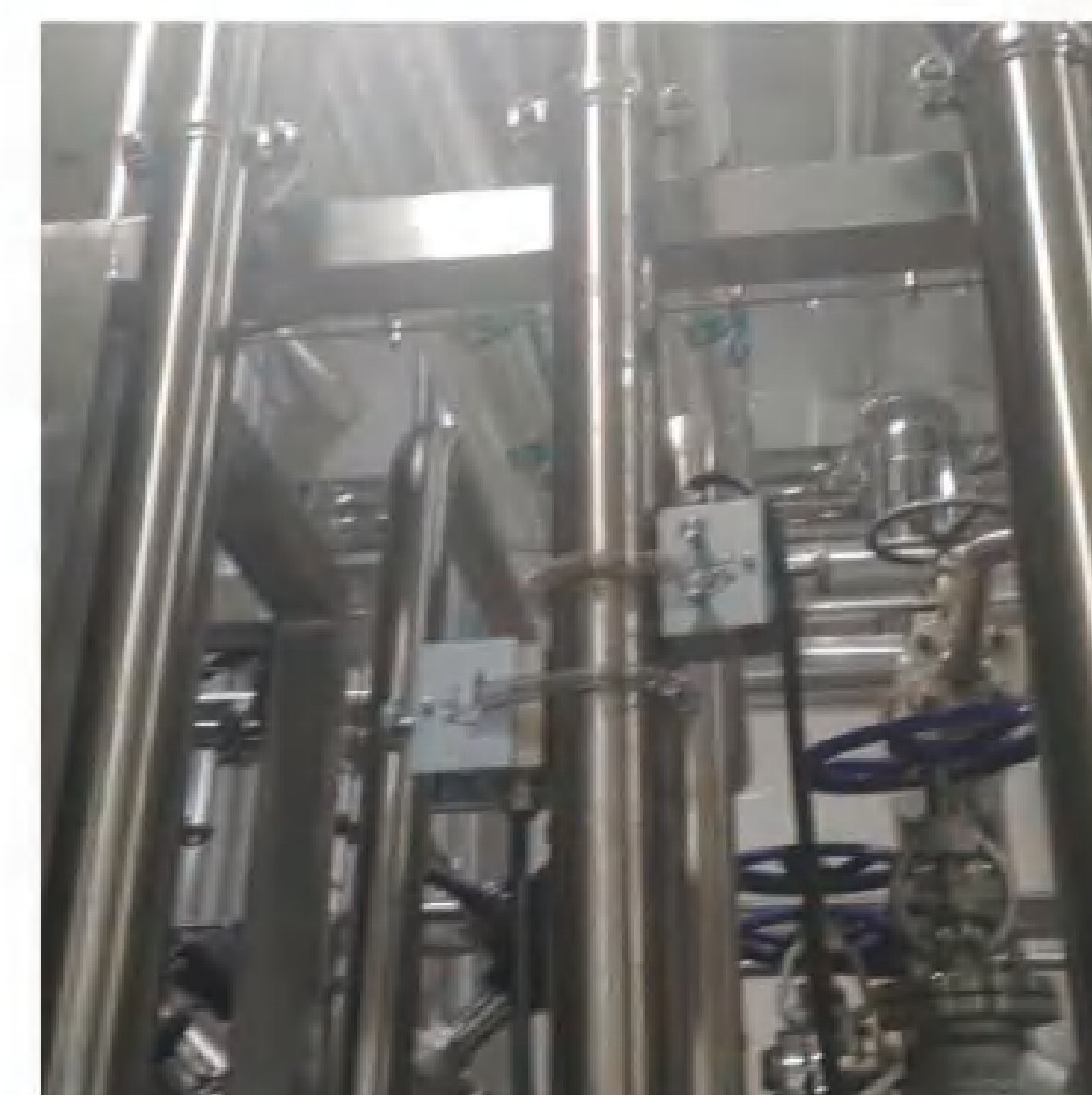
K:Constant

dt:Difference in time of flight

TL:Average Transit Time

When the flow meter works, the two transducers transmit and receive ultrasonic signals amplified by multi beam which travels firstly downstream and then upstream. Because ultrasonic sound travels faster downstream than upstream, there will be a difference of time of flight (dt). When the flow is still, the time difference (dt) is zero. Therefore, as long as we know the time of flight both downstream and upstream, we can work out the time difference, and then the flow velocity (Vf) via the following formula.

Application Pictures:



Wall-mounted Transit-Time Ultrasonic Flowmeter TF1100-EC



Specifications:

Transmitter:

| | |
|----------------------------|---|
| Measurement principle | Ultrasonic transit-time difference correlation principle |
| Flow velocity range | 0.01 to 12 m/s, bi-directional |
| Resolution | 0.25mm/s |
| Repeatability | 0.2% of reading |
| Accuracy | ±1.0% of reading at rates >0.3 m/s; ±0.003 m/s of reading at rates <0.3 m/s |
| Response time | 0.5s |
| Sensitivity | 0.003m/s |
| Damping of displayed value | 0-99s(selectable by user) |
| Liquid Types Supported | Both clean and somewhat dirty liquids with turbidity <10000 ppm |
| Power Supply | AC: 85-265V DC: 24V/500mA |
| Enclosure type | Wall-mounted |
| Degree of protection | IP66 according to EN60529 |
| Operating temperature | -20°C to +60°C |
| Housing material | Fiberglass |
| Display | 3.5" color LCD display, 16 keys |
| Units | User Configured (English and Metric) |
| Rate | Rate and Velocity Display |
| Totalized | gallons, ft³, barrels, lbs, liters, m³,kg |
| Thermal energy | unit GJ, KWh can be optional |
| Communication | 4-20mA, OCT, Relay,RS232, RS485 (Modbus), Datalogger, NB-IoT, GPRS |
| Size | 244*196*114mm |
| Weight | 2.4kg |

Transducer:

| | |
|---------------------------|--|
| Degree of protection | IP65 according to EN60529.(IP67 or IP68 Upon request) |
| Suited Liquid Temperature | -35°C~200°C |
| Pipe diameter range | 20-50mm for type B, 40-5000mm for type A |
| Transducer Size | Type B 40(h)*24(w)*22(d)mm Type A 46(h)*31(w)*28(d)mm |
| Material of transducer | Aluminum + Peek |
| Cable Length | Std:10m |
| Temperature Sensor | Pt1000 clamp-on Accuracy: ±0.1% |

Features:

- Non-invasive transducers are easy to install, cost effective, and require no pipe cutting or processing interrupt.
- Wide liquid temperature range: -35°C~200°C.
- Data logger function.
- Thermal energy measurement capability can be optional.
- For commonly used pipe materials and diameters from 20mm to 5000mm.
- Wide bi-directional flow range of 0.01 m/s to 12 m/s.

Configuration Code:

| | |
|---------------------------------|--|
| TF1100-EC | Wall-mounted Transit-time Clamp-on Ultrasonic Flowmeter |
| Power supply | |
| A | 85-265VAC |
| D | 24VDC |
| S | 65W Solar supply |
| Output Selection 1 | |
| N | N/A |
| 1 | 4-20mA (accuracy 0.1%) |
| 2 | OCT |
| 3 | Relay Output (Totalizer or Alarm) |
| 4 | RS232 Output |
| 5 | RS485 Output (ModBus-RTU Protocol) |
| 6 | Data storage function |
| 7 | GPRS |
| Output Selection 2 | |
| Same as above | |
| Output Selection 3 | |
| Transducer Type | |
| B | DN20-50 -35~200°C |
| A | DN40-5000 -35~200°C |
| Temperature Input Sensor | |
| N | None |
| T | Clamp-on PT1000 |
| Pipeline Diameter | |
| DNX | e.g. DN20—20mm, DN6000—6000mm |
| Cable length | |
| 10m | 10m (standard 10m) |
| Xm | Common cable Max 300m(standard 10m) |
| XmH | High temp. cable Max 300m |

TF1100-EC -A - 1 - 2 - 3 /LTC- B - N - DN100 - 10m (example configuration)

Description:

Power supply: 85-265VAC; Output: 4-20mA, OCT & Relay; transducer type: A for DN40-5000 -35~200°C; without PT1000 temperature sensor; DN100 application; 10m transducer cables.



Features:

- Hot-tapped installation, no pipe line flow interrupted.
- No moving parts, no pressure drop, no maintenance.
- Spool-piece transducer for best accuracy and better long-term stability.
- High temp. Insertion transducers are suitable for high temperature of -35°C~150°C.
- Wide bi-directional Flow range of 0.01 to 12m/s, and wide range of pipe sizes from DN65 to DN6000.
- Data logger function.
- The heat measurement function by configuring with paired temperature sensors.

Specifications:

Transmitter:

| | |
|----------------------------|---|
| Measurement principle | Ultrasonic transit-time difference correlation principle |
| Flow velocity range | 0.01 to 12 m/s, bi-directional |
| Resolution | 0.25mm/s |
| Repeatability | 0.2% of reading |
| Accuracy | ±1.0% of reading at rates >0.3 m/s; ±0.003 m/s of reading at rates <0.3 m/s |
| Response time | 0.5s |
| Sensitivity | 0.003m/s |
| Damping of displayed value | 0-99s(selectable by user) |
| Liquid Types Supported | Both clean and somewhat dirty liquids with turbidity <10000 ppm |
| Power Supply | AC: 85-265V DC: 24V/500mA |
| Enclosure type | Wall-mounted |
| Degree of protection | IP66 according to EN60529 |
| Operating temperature | -20°C to +60°C |
| Housing material | Fiberglass |
| Display | 3.5" color LCD display, 16 keys |
| Units | User Configured (English and Metric) |
| Rate | Rate and Velocity Display |
| Totalized | gallons, ft ³ , barrels, lbs, liters, m ³ ,kg |
| Thermal energy | Unit GJ, kWh can be optional |
| Communication | 4-20mA, OCT, Relay, RS232, RS485(Modbus), Datalogger, NB-IoT, GPRS |
| Size | 244*196*114mm |
| Weight | 2.4kg |

Transducer:

| | |
|---------------------------|---|
| Degree of protection | IP67 or IP68 according to EN60529 |
| Suited Liquid Temperature | Std. Temp.: -35°C~85°C High Temp.: -35°C~150°C |
| Pipe diameter range | DN65-6000 |
| Transducer Size | Type S Φ58*199mm |
| Material of transducer | SUS304 (Std. Temp.); SUS304+Peek (High Temp.) |
| Cable Length | Std: 10m |
| Temperature Sensor | PT1000 insertion or clamp-on Accuracy: ±0.1% |

Configuration Code:

| | |
|------------------|---|
| TF1100-EI | Wall-mounted Transit-time Insertion Ultrasonic Flowmeter |
| | Power supply |
| A | 85-265VAC |
| D | 24VDC |
| S | 65W Solar supply |
| | Output Selection 1 |
| N | N/A |
| 1 | 4-20mA (accuracy 0.1%) |
| 2 | OCT |
| 3 | Relay Output (Totalizer or Alarm) |
| 4 | RS232 Output |
| 5 | RS485 Output (ModBus-RTU Protocol) |
| 6 | Data storage function |
| 7 | GPRS |
| | Output Selection 2 |
| | Same as above |
| | Output Selection 3 |
| | Transducer Type |
| S | Standard Insertion for pipe DN65-DN6000 |
| | Transducer Temperature |
| S | -35~85°C |
| H | -35~150°C |
| | Temperature Input Sensor |
| N | None |
| T | PT1000 |
| | Pipeline Diameter |
| DNXX | e.g.DN65—65mm, DN1400—1400mm |
| | Cable length |
| 10m | 10m (standard 10m) |
| Xm | Common cable Max 300m(standard 10m) |
| XmH | High temp. cable Max 300m |

TF1100-EI -A-1-2-3 /LTI- S - S - N - DN100 - 10m (example configuration)

Description:

Power supply: 85-265VAC; output: 4-20mA, OCT & Relay; transducer type: standard insertion transducer for DN65-6000; transducer temperature:-35 ~ 85°C;without PT1000 temperature sensor; DN100 application; 10m transducer cables.



Specifications:

Transmitter:

| | |
|----------------------------|---|
| Measurement principle | Ultrasonic transit-time difference correlation principle |
| Flow velocity range | 0.01 to 12 m/s, bi-directional |
| Resolution | 0.25mm/s |
| Repeatability | 0.2% of reading |
| Accuracy | ±1.0% of reading at rates >0.3 m/s; ±0.003 m/s of reading at rates <0.3 m/s |
| Response time | 0.5s |
| Sensitivity | 0.003m/s |
| Damping of displayed value | 0-99s(selectable by user) |
| Liquid Types Supported | Both clean and somewhat dirty liquids with turbidity <10000 ppm |
| Power Supply | AC: 85-265V Up to 14 hours with fully charged internal batteries |
| Enclosure type | Handheld |
| Degree of protection | IP65 according to EN60529 |
| Operating temperature | -20°C to +60°C |
| Housing material | ABS |
| Display | 4 line×16 English letters LCD graphic display, backlit |
| Units | User Configured (English and Metric) |
| Rate | Rate and Velocity Display |
| Totalized | gallons, ft³, barrels, lbs, liters, m³,kg |
| Communication | RS232 ,Data Logger |
| Security | Keypad lockout, system lockout |
| Size | 212*100*36mm case:410X320X80mm |
| Weight | 0.5kg |

Transducer:

| | |
|---------------------------|--|
| Degree of protection | IP65 according to EN60529.(IP67 or IP68 Upon request) |
| Suited Liquid Temperature | Std. Temp.: -35°C~85°C High Temp.: -35°C~200°C |
| Pipe diameter range | DN20-50 for type S and B, DN40-5000 for type M and A |
| Transducer Size | Type S 48(h)*28(w)*28(d)mm Type M 60(h)*34(w)*32(d)mm Type B 40(h)*24(w)*22(d)mm Type A 46(h)*31(w)*28(d)mm |
| Material of transducer | Aluminum (standard temperature); Peek (high temperature) |
| Cable Length | Std: 5m |

Features:

- 14 hours battery (rechargeable), back-lit 4 lines display.
- Data logger function.
- Can be used for mobile measurement, flow rate calibration, data comparing, meters running status checking.
- Non-invasive transducers.
- Wide bi-directional flow range of 0.01 m/s to 12 m/s. Wide liquid temperature range: -35°C~200°C.
- Works reliably in both clean and somewhat dirty liquids with turbidity<10000ppm.
- Lightweight and easily transportable in box.

Configuration Code:

| | |
|---------------------------|--|
| TF1100-CH | Handheld Transit-time Ultrasonic Flowmeter |
| Power supply | |
| A | 85-265VAC |
| Output Selection 1 | |
| N | N/A |
| 2 | RS232 Output |
| 3 | Data storage function |
| Output Selection 2 | |
| Same as above | |
| Transducer Type | |
| S | DN20-50 -35~85°C |
| M | DN40-5000 -35~85°C |
| B | DN20-50 -35~200°C |
| A | DN40-5000 -35~200°C |
| Transducer Rail | |
| N | None |
| RS | DN20-50 |
| RM | DN40-600 (For larger pipe size, pls contact us.) |
| Pipeline Diameter | |
| DNX | e.g.DN50—50mm, DN4500—4500mm |
| Cable length | |
| 5m | 5m (standard 5m) |
| Xm | Common cable Max 300m(standard 5m) |
| XmH | High temp. cable Max 300m |

TF1100-CH -A -2 /LTCH -M -N -DN100 -5m (example configuration)

Description:

Power supply: 85-265VAC; output: RS232; transducer type: M for DN40-5000 -35-85°C without transducer rails; without PT1000 temperature sensor; DN100 application; 5m transducer cables.



Features:

- 50-hour battery (rechargeable), color LCD display all integrated into a rugged, watertight enclosure.
- Data logger function.
- The heat measurement function by configuring with paired temperature sensors.
- Non-invasive transducers.
- Wide bi-directional flow range of 0.01 m/s to 12 m/s. Wide liquid temperature range: -35°C~200°C.
- Works reliably in both clean and somewhat dirty liquids with turbidity<10000ppm.
- Lightweight and easily transportable in box.

Specifications:

Transmitter:

| | |
|----------------------------|---|
| Measurement principle | Ultrasonic transit-time difference correlation principle |
| Flow velocity range | 0.01 to 12 m/s, bi-directional |
| Resolution | 0.25mm/s |
| Repeatability | 0.2% of reading |
| Accuracy | ±1.0% of reading at rates >0.3 m/s;±0.003 m/s of reading at rates<0.3 m/s |
| Response time | 0.5s |
| Sensitivity | 0.003m/s |
| Damping of displayed value | 0-99s(selectable by user) |
| Liquid Types Supported | Both clean and somewhat dirty liquids with turbidity <10000 ppm |
| Power Supply | AC: 85-265V Up to 50 hours with fully charged internal batteries |
| Enclosure type | Portable |
| Degree of protection | IP66 |
| Operating temperature | -20°C to +60°C |
| Housing material | ABS |
| Display | 4.3" color LCD display, 16 keys |
| Units | User Configured (English and Metric) |
| Rate | Rate and Velocity Display |
| Totalized | gallons, ft ³ , barrels, lbs, liters, m ³ ,kg |
| Thermal energy | unit GJ, KWh can be optional |
| Communication | 4~20mA,OCT, RS232, RS485 (Modbus),Data Logger, GPRS |
| Size | 270X215X175mm |
| Weight | 3kg |

Transducer:

| | |
|---------------------------|--|
| Degree of protection | IP65 according to EN60529.(IP67 or IP68 Upon request) |
| Suited Liquid Temperature | -35°C~200°C |
| Pipe diameter range | 20~50mm for type B, 40~5000mm for type A |
| Transducer Size | Type B 40(h)*24(w)*22(d)mm Type A 46(h)*31(w)*28(d)mm |
| Material of transducer | Aluminum + Peek |
| Cable Length | Std: 5m |
| Temperature Sensor | PT1000 clamp-on Accuracy: ±0.1% |

Configuration Code:

| | |
|---------------------------------|---|
| TF1100-EP | Portable Transit-time Ultrasonic Flowmeter |
| Power supply | |
| A | 85-265VAC |
| Output Selection 1 | |
| N | N/A |
| 1 | 4-20mA (accuracy 0.1%) |
| 2 | OCT |
| 3 | RS232 Output |
| 4 | RS485 Output (ModBus-RTU Protocol) |
| 5 | Data storage function |
| 6 | GPRS |
| Output Selection 2 | |
| Same as above | |
| Output Selection 3 | |
| Transducer Type | |
| B | DN20-50 -35~200°C |
| A | DN40-5000 -35~200°C |
| Temperature Input Sensor | |
| N | None |
| T | Clamp-on PT1000(DN20-1000) (0~200°C) |
| Pipeline Diameter | |
| DNX | e.g.DN20—20mm, DN5000—5000mm |
| Cable length | |
| 5m | 5m (standard 5m) |
| Xm | Common cable Max 300m(standard 5m) |
| XmH | High temp. cable Max 300m |

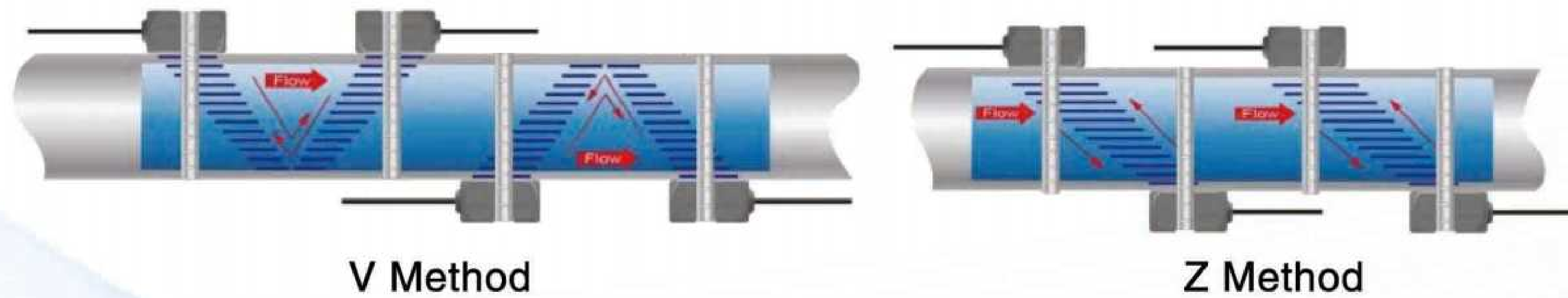
TF1100-EP -A -1 -2 -5 /LTP -A -N - DN100 - 5m (example configuration)

Description:

Power supply: 85~265VAC; output: 4~20mA, OCT & Data storage function; transducer type: A for DN40~5000 -35~200°C; Without PT1000 temperature sensor; DN100 application; 5m transducer cables.

Principle of measurement:

The TF1100 transit time flow meter utilizes two pairs transducers that function as ultrasonic transmitters and receivers. The transducers are installed on the outside of a closed pipe at a specific distance from each other. The transducers can be mounted in V-method where the sound transverses the pipe twice, or W-method (rarely used) where the sound transverses the pipe four times, or in Z-method where the transducers are mounted on opposite sides of the pipe and the sound crosses the pipe once. This selection of the mounting method depends on pipe and liquid characteristics. The flow meter operates by alternately transmitting and receiving a frequency modulated burst of sound energy between the two pairs transducers and measuring the transit time that it takes for sound to travel between the two pairs transducers. The difference between the transit-time is directly and exactly related to the velocity of the liquid in the pipe.



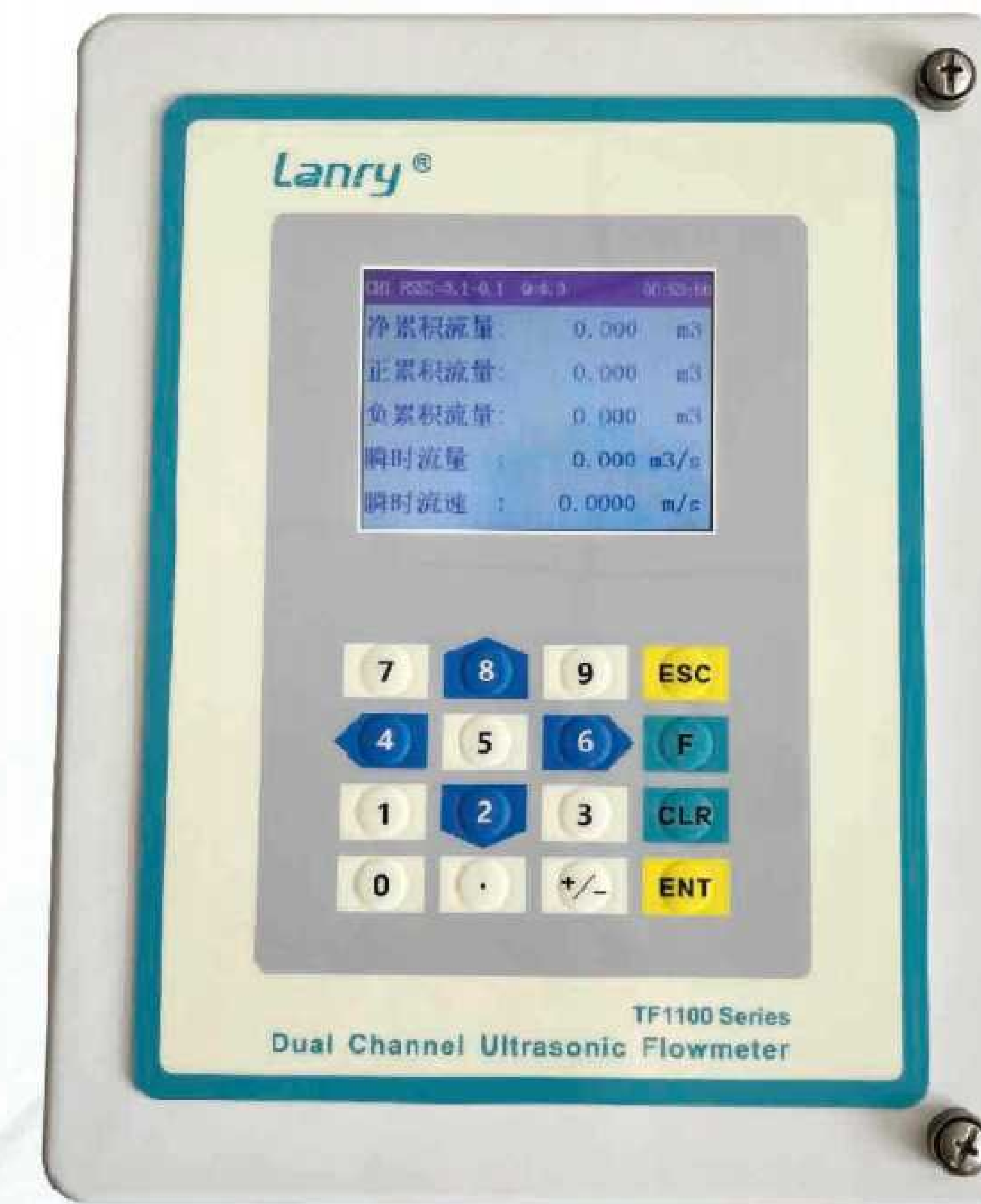
$$V_f = Kdt / TL$$

Where:

- Vf: Liquid velocity
- K: Constant
- dt: Difference in time of flight
- TL: Average Transit Time

Applications:

- Water, sewage (with low particle content) and sea water, water supply and drainage water.
- Process liquids; Liquors.
- Milk, yoghurt milk.
- Gasoline kerosene diesel oil.
- Power supply.
- The flow patrolling and examining.
- Metallurgy, Laboratory.
- Energy-conservation, economize on water.
- Food and medicine.
- Heat measures, Heat balance.
- On-the-spot check-up, standard, the data are judged, Pipeline leak detection.



Features:

- Dual channels ultrasonic transit-time sensor for high accuracy 0.5%.
- Easy to install, cost effective, and require no pipe cutting or processing interrupt.
- Wide liquid temperature range: -35°C~200°C.
- Data logger function.
- Thermal energy measurement capability can be optional.
- For commonly used pipe materials and diameters from 20mm to 5m.
- Wide bi-directional flow range of 0.01m/s to 15 m/s.
- User-friendly configuration.
- With the ability of dynamic zero.

Specifications:

Transmitter:

| | |
|----------------------------|---|
| Measurement principle | Ultrasonic transit-time difference correlation principle |
| Flow velocity range | 0.01 to 15 m/s, bi-directional |
| Resolution | 0.1mm/s |
| Repeatability | 0.15% of reading |
| Accuracy | ± 0.5%R |
| Response time | 0.5s |
| Sensitivity | 0.001m/s |
| Damping of displayed value | 0-99s(selectable by user) |
| Liquid Types Supported | Both clean and somewhat dirty liquids with turbidity <10000 ppm |
| Power Supply | AC: 85-265V DC: 12-24V |
| Enclosure type | Wall-mounted |
| Degree of protection | IP66 according to EN60529 |
| Operating temperature | -10°C to + 60°C |
| Housing material | Fiberglass |
| Display | 3.5" color LCD display, 16 keys |
| Units | User Configured (English and Metric) |
| Rate | Rate and Velocity Display |
| Totalized | gallons, ft ³ , barrels, lbs, liters, m ³ ,kg |
| Thermal energy | unit GJ, KWh can be optional |
| Communication | 4-20mA, OCT, Relay, RS485(Modbus), Datalogger, GPRS, NB-IoT |
| Size | 244*196*114mm |
| Weight | 2.4kg |

Transducer:

| | |
|---------------------------|--|
| Degree of protection | Standard IP65; IP67, IP68 can be optional |
| Suited Liquid Temperature | -35°C~200°C |
| Pipe diameter range | 20-50mm for type B; 40-5000mm for type A |
| Transducer Size | Type B 40(h)*24(w)*22(d)mm Type A 46(h)*31(w)*28(d)mm |
| Material of transducer | Aluminum + Peek |
| Cable Length | Std:5m |
| Temperature Sensor | PT1000 clamp-on Accuracy: ±0.1% |

Configuration Code:

| | |
|---------------------------------|---|
| TF1100-DC | Wall-mounted Dual Channels Clamp On Ultrasonic Flowmeter |
| Power supply | |
| A | 85-265VAC |
| D | 24VDC |
| S | Solar supply |
| Output Selection 1 | |
| N | N/A |
| 1 | 4-20mA (accuracy 0.1%) |
| 2 | OCT |
| 3 | Relay Output (Totalizer or Alarm) |
| 4 | RS232 Output |
| 5 | RS485 Output (ModBus-RTU Protocol) |
| 6 | Data storage function |
| 7 | GPRS |
| Output Selection 2 | |
| Same as above | |
| Output Selection 3 | |
| Transducer Type | |
| B | DN20-50 -35~200°C |
| A | DN40-5000 -35~200°C |
| 2B | DN20-50 -35~200°C, two pairs of sensors |
| 2A | DN40-5000 -35~200°C, two pairs of sensors |
| Temperature Input Sensor | |
| N | None |
| T | Clamp-on PT1000(DN20-1000) (0~200°C) |
| Pipeline Diameter | |
| DNX | e.g.DN20-20mm, DN5000-5000mm |
| Cable length | |
| 10m | 10m (standard 10m) |
| Xm | Common cable Max 300m (standard 10m) |
| XmH | High temperature. cable Max 300m |

TF1100-DC - A - 1 - 2 - 3 /LTDC - 2A - N -DN100 -10m (example configuration)

Description:

Power supply: 85-265VAC; output: 4-20mA, OCT, Relay output; transducer type: 2A for DN40-5000 -35-200°C; without PT1000 temperature sensor; DN100 application; 10m transducer cables.

Insertion Dual-Channel Ultrasonic Flowmeter TF1100-DI



Features:

- Hot-tapped installation, no pipe line flow interrupted.
- No moving parts, no pressure drop, no maintenance.
- The accuracy is $\pm 0.5\%$ for dual channels insertion ultrasonic flowmeter.
- A wide range of flow measurement, high flow rate can reach 15m/s.
- High-temperature transducer is suitable to liquids of $-35^{\circ}\text{C} \sim 150^{\circ}\text{C}$.
- Wide bi-directional flow range of 0.01 to 15m/s, and wide range of pipe sizes from DN65-6000.
- Data logger function.
- The heat measurement function by configuring with paired temperature sensors.
- With the ability of dynamic zero.

Specifications:

Transmitter:

| | |
|----------------------------|---|
| Measurement principle | Ultrasonic transit-time difference correlation principle |
| Flow velocity range | 0.01 to 15 m/s, bi-directional |
| Resolution | 0.1mm/s |
| Repeatability | 0.15% of reading |
| Accuracy | $\pm 0.5\%R$ |
| Response time | 0.5s |
| Sensitivity | 0.001m/s |
| Damping of displayed value | 0-99s(selectable by user) |
| Liquid Types Supported | Both clean and somewhat dirty liquids with turbidity <10000 ppm |
| Power Supply | AC: 85-265V DC: 12-24V |
| Enclosure type | Wall-mounted |
| Degree of protection | IP66 according to EN60529 |
| Operating temperature | -10°C to $+60^{\circ}\text{C}$ |
| Housing material | Fiberglass |
| Display | 3.5" color LCD display, 16 keys |
| Units | User Configured (English and Metric) |
| Rate | Rate and Velocity Display |
| Totalized | gallons, ft ³ , barrels, lbs, liters, m ³ ,kg |
| Thermal energy | unit GJ, KWh can be optional |
| Communication | 4-20mA, OCT, Relay, RS485(Modbus), Datalogger, GPRS, NB-IoT |
| Size | 244*196*114mm |
| Weight | 2.4kg |

Transducer:

| | |
|---------------------------|---|
| Transducers Type | Insertion |
| Degree of protection | IP65, IP67 or IP68 according to EN60529 |
| Suited Liquid Temperature | $-35 \sim 150^{\circ}\text{C}$ |
| Pipe diameter range | S for 65mm-6000mm |
| Transducer Size | $\phi 58 \times 199\text{mm}$ |
| Material of transducer | SUS304 + Peek |
| Cable Length | Std: 10m |

Configuration Code:

| | |
|---------------------------------|--|
| TF1100-DI | Dual Channels Insertion Type Ultrasonic Flowmeter |
| Power supply | |
| A | 85-265VAC |
| D | 24VDC |
| S | Solar supply |
| Output Selection 1 | |
| N | N/A |
| 1 | 4-20mA (accuracy 0.1%) |
| 2 | OCT |
| 3 | Relay Output (Totalizer or Alarm) |
| 4 | RS232 Output |
| 5 | RS485 Output (ModBus-RTU Protocol) |
| 6 | Data storage function |
| 7 | GPRS |
| Output Selection 2 | |
| Same as above | |
| Output Selection 3 | |
| Transducer Type | |
| S | DN65-6000 -35~150°C |
| 2S | DN65-6000 -35~150°C, two pairs of sensors |
| Temperature Input Sensor | |
| N | None |
| T | Clamp-on PT1000(DN20-1000) (0~200°C) |
| Pipeline Diameter | |
| DNX | e.g.DN20-20mm, DN5000-5000mm |
| Cable length | |
| 10m | 10m (standard 10m) |
| Xm | Common cable Max 300m (standard 10m) |
| XmH | High temperature. cable Max 300m |

TF1100-DI - A - 1 - 2 - 3 / LTDI - 2S - N - DN100 - 10m (example configuration)

Description:

Power supply: 85-265VAC; output: 4-20mA, OCT, Relay output; transducer type: 2S for DN65-6000 -35~150°C; without PT1000 temperature sensors; DN100 application; 10m transducer cables.



Features:

- 50-hour battery (rechargeable), color LCD display all integrated into a rugged, watertight enclosure.
- Data logger function.
- The heat measurement function by configuring with paired temperature sensors.
- Non-invasive transducers.
- Wide bi-directional flow range of 0.01 m/s to 15 m/s. Wide liquid temperature range: -35°C~200°C.
- Works reliably in both clean and somewhat dirty liquids with turbidity<10000ppm.
- Lightweight and easily transportable in box.
- The accuracy is ± 0.5%.
- With the ability of dynamic zero.

Specifications:

Transmitter:

| | |
|----------------------------|---|
| Measurement principle | Ultrasonic transit-time difference correlation principle |
| Flow velocity range | 0.01 to 15 m/s, bi-directional |
| Resolution | 0.1mm/s |
| Repeatability | 0.15% of reading |
| Accuracy | ± 0.5%R |
| Response time | 0.5s |
| Sensitivity | 0.001m/s |
| Damping of displayed value | 0-99s(selectable by user) |
| Liquid Types Supported | Both clean and somewhat dirty liquids with turbidity <10000 ppm |
| Power Supply | AC: 85-265V DC: 12-24V |
| Enclosure type | Portable |
| Degree of protection | IP66 according to EN60529 |
| Operating temperature | -10°C to + 60°C |
| Housing material | ABS |
| Display | 4.3" color LCD display, 16 keys |
| Units | User Configured (English and Metric) |
| Rate | Rate and Velocity Display |
| Totalized | gallons, ft³, barrels, lbs, liters, m³,kg |
| Thermal energy | unit GJ, KWh can be optional |
| Communication | 4-20mA, OCT, RS485(Modbus), Datalogger, GPRS |
| Size | 270*215*175mm |
| Weight | 2.4kg |

Transducer:

| | |
|---------------------------|--|
| Degree of protection | Standard IP65; IP67, IP68 can be optional |
| Suited Liquid Temperature | -35°C~200°C |
| Pipe diameter range | 20-50mm for type B; 40-5000mm for type A |
| Transducer Size | Type B 40(h)*24(w)*22(d)mm Type A 46(h)*31(w)*28(d)mm |
| Material of transducer | Aluminum + Peek |
| Cable Length | Std: 5m |
| Temperature Sensor | PT1000 clamp-on Accuracy: ±0.1% |

Configuration Code:

| | |
|---------------------------------|---|
| TF1100-DP | Portable Dual Channels Clamp On Ultrasonic Flowmeter |
| Power supply | |
| A | 85-265VAC |
| Output Selection 1 | |
| N | N/A |
| 1 | 4-20mA (accuracy 0.1%) |
| 2 | OCT |
| 3 | RS232 Output |
| 4 | RS485 Output (ModBus-RTU Protocol) |
| 5 | Data storage function |
| 6 | GPRS |
| Output Selection 2 | |
| Same as above | |
| Output Selection 3 | |
| Transducer Type | |
| B | DN20-50 -35~200°C |
| A | DN40-5000 -35~200°C |
| 2B | DN20-50 -35~200°C, two pairs of sensors |
| 2A | DN40-5000 -35~200°C, two pairs of sensors |
| Temperature Input Sensor | |
| N | None |
| T | Clamp-on PT1000(DN20-1000) (0~200°C) |
| Pipeline Diameter | |
| DNX | e.g.DN20-20mm, DN5000-5000mm |
| Cable length | |
| 5m | 5m (standard 5m) |
| Xm | Common cable Max 300m (standard 5m) |
| XmH | High temperature. cable Max 300m |

TF1100-DP - A - 1 - 2 - 3 / LTDP - 2A - N - DN100 - 5m (example configuration)

Description:

Power supply: 85-265VAC; output: 4-20mA, OCT, Relay output;

transducer type: 2A for DN40-5000 -35~200°C; without PT1000 temperature sensors; DN100 application; 5m transducer cables.

General:

The DF6100 Doppler ultrasonic flow meter is designed to measure volumetric flow of solids-bearing or aerated liquid within closed conduit, the pipe line must be full of liquids, and there must be a certain amount of air bubbles or suspended solids in liquid.

Transducers are clamp-on(DF6100-EC/EP) or hot-tapped insertion(DF6100-EI) types, user don't need to shut down the pipe flow when install transducers.

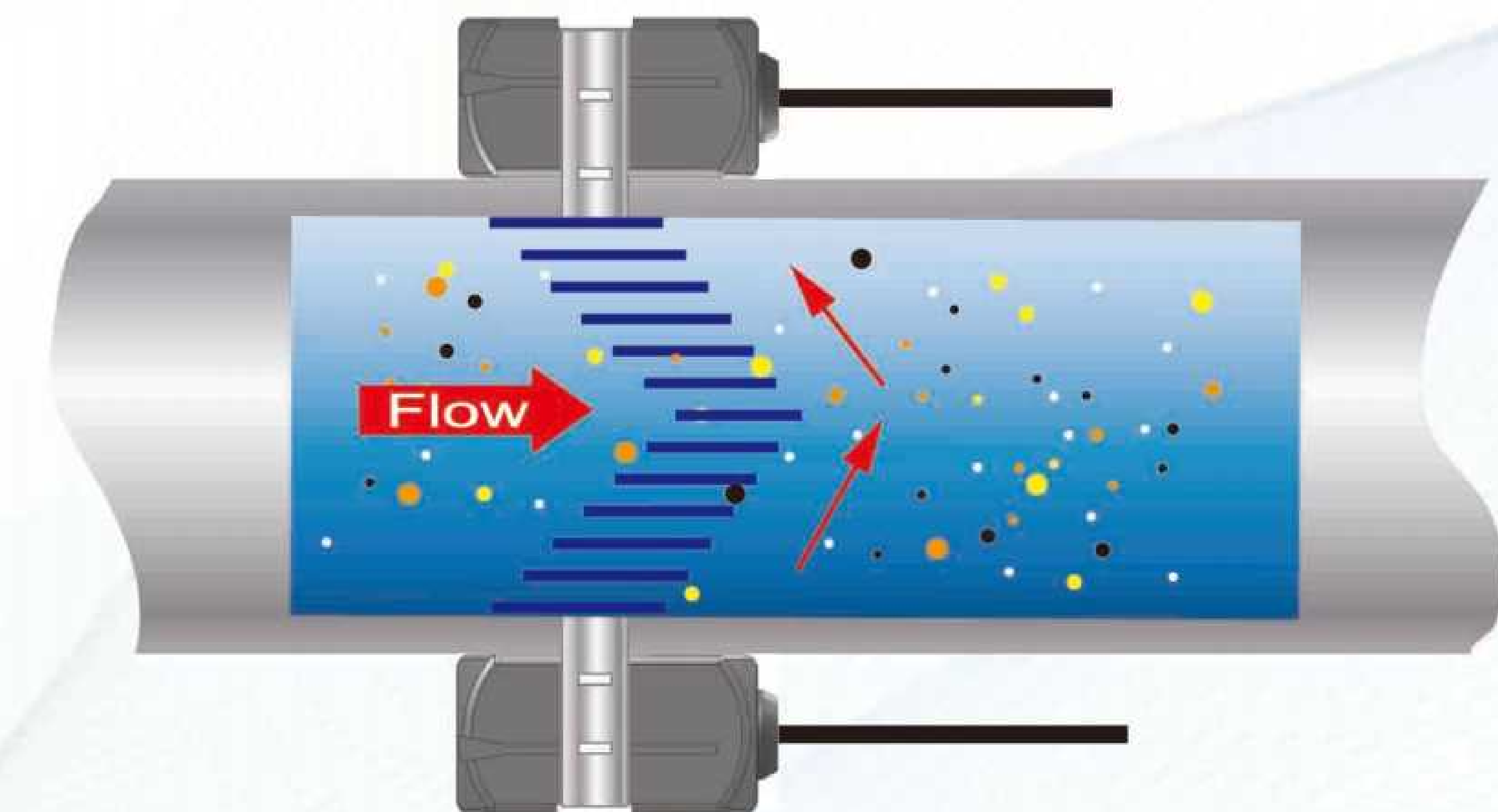
The Doppler ultrasonic flow meter can display flow rate and flow totalizer, etc., and is configured with 4-20mA, Relays, OCT outputs.

Applications:

- Raw sewage
- Activated sludge
- Ground water
- Pulp and paper slurries
- Chemical slurries
- Drainage
- Mining recirculation



Principle of Measurement:



The flowmeter operates by transmitting an ultrasonic sound from its transmitting transducer, the sound will be reflected by useful sonic reflectors suspended within the liquid and recorded by the receiving transducer. If the sonic reflectors are moving within the sound transmission path, sound waves will be reflected at a frequency shifted (Doppler frequency) from the transmitted frequency. The shift in frequency will be directly related to the speed of the moving particle or bubble. This shift in frequency is interpreted by the instrument and converted to various user defined measuring units.

There must be some particles large enough to cause longitudinal reflection – particles larger than 100 micron.

When install the transducers, the installation location must have enough straight pipe length upstream and downstream. Commonly, the upstream needs 10D and downstream needs 5D straight pipe length, where D is pipe diameter.



Specifications:

Transmitter:

| | |
|------------------------|--|
| Measurement principle | Doppler ultrasonic |
| Resolution | 0.25mm/s |
| Repeatability | 0.5% of reading |
| Accuracy | 0.5% -- 2.0% F.S. |
| Response time | 2-60s for optional |
| Flow Velocity Range | 0.05- 12 m/s |
| Liquid Types Supported | Liquids containing 100ppm of reflectors and at least 20% of the reflectors are larger than 100 micron. |
| Power Supply | AC: 85-265V DC: 24V/500mA |
| Enclosure type | Wall-mounted |
| Degree of protection | IP66 according to EN60529 |
| Operating temperature | -20°C to +60°C |
| Housing material | Fiberglass |
| Measurement Channels | 1 |
| Display | 2 line × 8 characters LCD, 8-digit rate or 8-digit total (resettable) |
| Units | User Configured (English and Metric) |
| Rate | Rate and Velocity Display |
| Totalized | gallons, ft ³ , barrels, lbs, liters, m ³ ,kg |
| Communication | 4-20mA, Relay and OCT output |
| Keypad | 4pcs buttons |
| Size | 244(h)*196(w)*114(d)mm |
| Weight | 2.4kg |

Transducer:

| | |
|---------------------------|--|
| Transducers Type | Clamp-on |
| Degree of protection | IP65, IP67 or IP68 according to EN60529 |
| Suited Liquid Temperature | Std. Temp.: -35°C~85°C High Temp.: -35°C~200°C |
| Pipe diameter range | 40-4000 mm |
| Transducer Size | 60(h)*34(w)*32(d)mm |
| Material of transducer | Aluminum (standard temperature); Peek (high temperature) |
| Cable Length | Std: 10m |

Features:

- It is suitable for pipe sizes ranging from 40 to 4000mm.
- For dirty liquids, a certain amount of air bubbles or suspended solids shall be contained.
- Excellent low flow rate measurement ability, low to 0.05m/s.
- A wide range of flow measurement, high flow rate can reach 12m/s.
- High-temperature transducer is suitable to liquids of -35°C ~ 200°C.
- Do not need to shut down the pipe flow when installing the transducers.
- User-friendly configuration.
- 4-20mA, Relay and OCT outputs.
- Accuracy: 2.0% calibrated span.

Configuration Code:

| | |
|-------------------------------|---|
| DF6100-EC | Wall-mounted Doppler Clamp-on Ultrasonic Flowmeter |
| Power supply | |
| A | 110VAC |
| B | 220VAC |
| D | 24VDC |
| S | 65W Solar supply (including solar board) |
| Output Selection 1 | |
| N | N/A |
| 1 | 4-20mA |
| 2 | Relay |
| 3 | OCT |
| Output Selection 2 | |
| Same as above | |
| Sensor Type | |
| D | Standard Clamp-on transducer (DN40-4000) |
| Transducer Temperature | |
| S | -35~85°C |
| H | -35~200°C |
| Pipeline Diameter | |
| DNX | e.g.DN40—40mm, DN4000—4000mm |
| Cable length | |
| 10m | 10m (standard 10m) |
| Xm | Common cable Max 300m(standard 10m) |
| XmH | High temp. cable Max 300m |

DF6100-EC — B — 1 — N /LDC— D — S — DN100 — 10m (example configuration)

Description:
 Power supply: 220VAC; output: 4-20mA; transducer type: standard for DN40-4000;transducer temperature: -35 ~ 85°C;
 DN100 application; 10m transducer cables.



Features:

- Do not need to shut down the pipe flow when installing the transducers.
- It is suitable for pipe sizes ranging from 65 to 4000mm.
- For dirty liquids, a certain amount of air bubbles or suspended solids shall be contained.
- Excellent low flow rate measurement ability, low to 0.05m/s.
- A wide range of flow measurement, high flow rate can reach 12m/s.
- High-temperature transducer is suitable to liquids of -35°C ~ 150°C.
- User-friendly configuration.
- 4-20mA, Relay and OCT outputs.
- Accuracy: 2.0% Calibrated span.

Specifications:

Transmitter:

| | |
|------------------------|--|
| Measurement principle | Doppler ultrasonic |
| Resolution | 0.25mm/s |
| Repeatability | 0.2% of reading |
| Accuracy | 0.5% -- 2.0% F.S. |
| Response time | 2-60s for optional |
| Flow Velocity Range | 0.05- 12 m/s |
| Liquid Types Supported | Liquids containing 100ppm of reflectors and at least 20% of the reflectors are larger than 100 micron. |
| Power Supply | AC: 85-265V DC: 24V/500mA |
| Enclosure type | Wall-mounted |
| Degree of protection | IP66 according to EN60529 |
| Operating temperature | -20°C to +60°C |
| Housing material | Fiberglass |
| Measurement Channels | 1 |
| Display | 2 line × 8 characters LCD, 8-digit rate or 8-digit total (resettable) |
| Units | User Configured (English and Metric) |
| Rate | Rate and Velocity Display |
| Totalized | gallons, ft ³ , barrels, lbs, liters, m ³ ,kg |
| Communication | 4-20mA,Relay and OCT output |
| keypad | 4pcs buttons |
| Size | 244(h)*196(w)*114(d)mm |
| Weight | 2.4kg |

Transducer:

| | |
|---------------------------|---|
| Transducers Type | Insertion |
| Degree of protection | IP67 or IP68 according to EN60529 |
| Suited Liquid Temperature | Std. Temp.: -35°C~85°C High Temp.: -35°C~150°C |
| Pipe diameter range | 65-4000 mm |
| Transducer Size | Φ58*199mm |
| Transducer material | SUS304 (Std. Temp.) ; SUS304 + Peek (High Temp.) |
| Cable Length | Std: 10m |

Configuration Code:

| | |
|-------------------------------|---|
| DF6100-EI | Insertion Doppler Ultrasonic Flowmeter |
| Power supply | |
| A | 110VAC |
| B | 220VAC |
| D | 24VDC |
| S | 65W Solar supply (including solar board) |
| Output Selection 1 | |
| N | N/A |
| 1 | 4-20mA |
| 2 | Relay |
| 3 | OCT |
| Output Selection 2 | |
| | Same as above |
| Sensor Type | |
| D | Standard Insertion Transducer (DN65-4000) |
| Transducer Temperature | |
| S | -35~85°C |
| H | -35~150°C |
| Pipeline Diameter | |
| DNX | e.g.DN65—65mm, DN1000—1000mm |
| Cable length | |
| 10m | 10m (standard 10m) |
| Xm | Common cable Max 300m(standard 10m) |
| XmH | High temp. cable Max 300m |

DF6100-EI — A — 1 — N /LDI— D — S — DN100 — 10m (example configuration)

Description:

Power supply: 110VAC; output: 4-20mA; transducer type: standard insertion transducer for DN65-4000;transducer temperature: -35 ~ 85°C; DN100 application; 10m transducer cables.



Specifications:

Transmitter:

| | |
|------------------------|--|
| Measurement principle | Doppler ultrasonic |
| Resolution | 0.25mm/s |
| Repeatability | 0.5% of reading |
| Accuracy | 0.5% -- 2.0% F.S. |
| Response time | 2-60s for optional |
| Flow Velocity Range | 0.05- 12 m/s |
| Liquid Types Supported | Liquids containing 100ppm of reflectors and at least 20% of the reflectors are larger than 100 micron. |
| Power Supply | AC: 85-265V Up to 50 hours with fully charged internal batteries |
| Enclosure type | Portable |
| Degree of protection | IP65 according to EN60529 |
| Operating temperature | -20°C to +60°C |
| Housing material | ABS |
| Measurement Channels | 1 |
| Display | 2 line × 8 characters LCD, 8-digit rate or 8-digit total (resettable) |
| Units | User Configured (English and Metric) |
| Rate | Rate and Velocity Display |
| Totalized | gallons, ft³, barrels, lbs, liters, m³,kg |
| Communication | 4-20mA, OCT output |
| Keypad | 6pcs buttons |
| Size | 270X125X175mm |
| Weight | 3kg |

Transducer:

| | |
|---------------------------|--|
| Transducers Type | Clamp-on |
| Degree of protection | IP65, IP67 or IP68 according to EN60529 |
| Suited Liquid Temperature | Std. Temp.: -35°C~85°C High Temp.: -35°C~200°C |
| Pipe diameter range | 40-4000 mm |
| Transducer Size | 60(h)*34(w)*32(d)mm |
| Material of transducer | Aluminum (standard temperature); Peek (high temperature) |
| Cable Length | Std: 5m |

Features:

- Rechargeable battery can work up to 50 hours.
- It is suitable for pipe sizes ranging from 40 to 4000mm.
- For dirty liquids, a certain amount of air bubbles or suspended solids shall be contained.
- Excellent low flow rate measurement ability, low to 0.05m/s.
- A wide range of flow measurement, high flow rate can reach 12m/s.
- High-temperature transducer is suitable to liquids of -35°C ~ 200°C.
- Do not need to shut down the pipe flow when installing the transducers.
- User-friendly configuration.
- 4-20mA, OCT outputs.

Configuration Code:

| | |
|-------------------------------|--|
| DF6100-EP | Portable Doppler Ultrasonic Flowmeter |
| Power supply | |
| A | 85-265VAC |
| Output Selection 1 | |
| N | N/A |
| 1 | 4-20mA |
| 2 | OCT |
| Output Selection 2 | |
| Same as above | |
| Sensor Type | |
| D | Standard Clamp-on transducer (DN40-4000) |
| Transducer Temperature | |
| S | -35~85℃ |
| H | -35~200℃ |
| Pipeline Diameter | |
| DNX | e.g.DN40—40mm, DN4000—4000mm |
| Cable length | |
| 5m | 5m (standard 5m) |
| Xm | Common cable Max 300m(standard 5m) |
| XmH | High temp. cable Max 300m |

DF6100-EP — A — 1 — N /LDP— D — S — DN600 — 5m (example configuration)

Description:
Power supply: 85-265VAC; output: 4-20mA; transducer type: standard for DN40-4000;transducer temperature: -35 ~ 85℃; DN600 application; 5m transducer cables.

General:

The DOF6000 series flowmeter consists of Flow calculator and the Ultraflow QSD 6537 Sensor.

The Ultraflow QSD 6537 Sensor is used to measure water velocity, depth, and conductivity of water flowing in rivers, streams, open channels and pipes. When used with a companion Lanry DOF6000 Calculator, flow rate and total flow can also be calculated.

The flow calculator can calculate the cross-sectional area of partially filled pipe,open channel stream or river,for stream or river, with up to 20 coordinate points describing the river' s shape of cross section. It' s suitable for various applications.



DOF6000-W (Wall-mounted type)

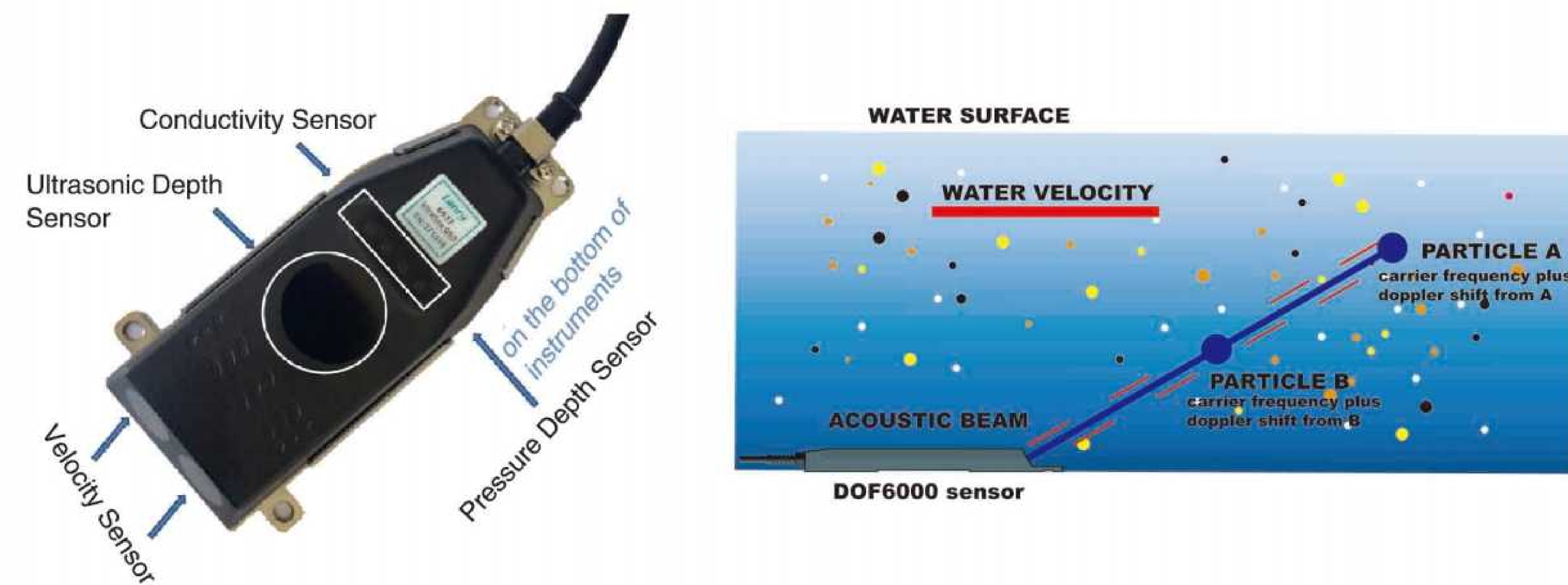


DOF6000-P (Portable type)

Features:

- 20 coordinate points to describe the river' s shape of cross section.
- One instrument can measure the velocity, depth,conductivity and temperature simultaneously.
- Velocity range : 0.02mm/s to 12m/s bidirectional, accuracy is 1%.
- Depth range: 0 to 10m.
- Measure velocity in both forward flow and back flow.
- Depth is measured by both the pressure sensor and ultrasonic level sensor principles.
- With barometric pressure compensation function.
- IP68 Epoxy-sealed body design, designed for under water installation.
- Separate sensor is with RS485 modbus/SDI-12 output to connect computer directly.

Principle of Measurement:



Application:

- Partially filled pipes
- Culvert
- Channel
- River and stream
- Water treatment
- Sewage treatment
- Irrigation
- Industrial waste
- Environmental monitoring

Specification:

Calculator:

| | |
|-----------------------|--|
| Type | Wall-mounted and Portable can be optional |
| Power supply | Calculator: 85–265VAC; 12–24VDC (only for wall mounted type) |
| IP class | Calculator: IP66 |
| Operating temperature | 0°C~60°C |
| Case material | Fiberglass (wall-mounted) ; ABS (portable) |
| Display | 4.3" color LCD |
| Output | Pulse, 4–20mA(Flow&Depth), RS485/Modbus, Daatalogger, GPRS |
| Size | 244×196×114mm(wall-mounted); 270×215×175mm(portable) |
| Weight | 2.4kg (wall-mounted); 3kg (portable) |
| Data logger | 16GB |
| Application | Partially Filled Pipe: 150–6000mm; Channel: width > 200mm |

Sensor:

| | | |
|------------------------------|-----------------------|---|
| Velocity | Range | 20mm/sec to 12m/sec Bidirectional velocity capability, set using configuration tools |
| | Accuracy | ± 1%R |
| | Resolution | 1mm/s |
| Depth (Ultrasonic) | Range | 20mm – 5000mm (5m) |
| | Accuracy | ± 1mm |
| | Resolution | 1mm |
| Depth (Pressure) | Range | 0mm to 10000mm (10m) |
| | Accuracy | ± 2mm |
| | Resolution | 1 mm |
| Temperature | Range | 0°C – 60°C |
| | Accuracy | ± 0.5°C |
| | Resolution | 0.1°C |
| Electrical Conductivity (EC) | Range | 0 to 200,000 μS/cm, Typically ± 1% of measurement |
| | Accuracy | ± 1%R |
| | Resolution | ± 1 μS/cm |
| | | recorded as a 16-bit value (0 to 65,535 μS/cm) or a 32-bit value (0 to 262,143 μS/cm) |
| Tilt (accelerometer) | Range | ± 70° in roll and pitch axes. |
| | Accuracy | ± 1° for angles less than 45° |
| Output | SDI-12 | SDI-12 v1.3, Max. cable 50m |
| | RS485 | Modbus RTU, Max. cable 500m |
| Environmental | Operating temperature | 0°C ~+60°C water temperature |
| | Storage temperature | -20°C ~+60°C |
| | IP class | IP68 |
| Others | Cable | The standard cable is 15m, the maximum option is 500m. |
| | Sensor material | Epoxy-sealed body, Marine Grade 316 Stainless Steel Mounting Bracket |
| | Sensor size | 135mm x 50mm x 20mm (L x W x H) |
| | Sensor weight | 1kg with 15m of cable |

Configuration Code:

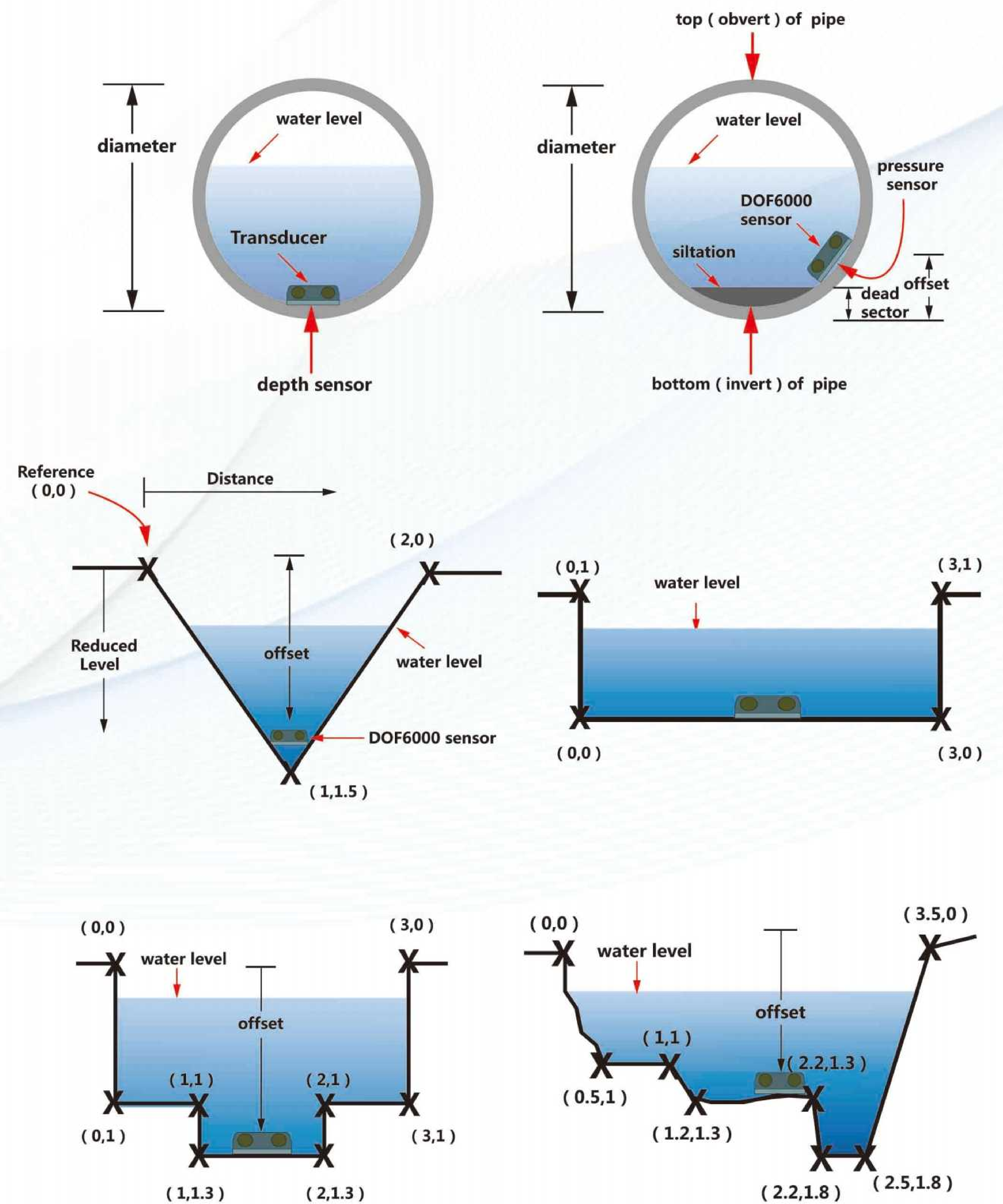
| | |
|----------------------------|--|
| DOF6000 | Doppler Open Channel Flowmeter |
| Calculator | |
| W | Wall-mounted |
| P | Portable |
| Power supply | |
| A | 85-265VAC |
| E | 24VDC (only for Wall-mounted Calculator) |
| Output | |
| N | None |
| C | 4-20mA |
| P | Pulse |
| F | RS485 (Modbus) |
| D | Data logger |
| G | GPRS |
| Level range | |
| 6537 | 0 to 10m |
| Sensor cable length | |
| 15m | 15m (standard) |
| XXm | more length, please contact us. |

DOF6000 -W -A -N / VL -6537 -15m (example configuration)

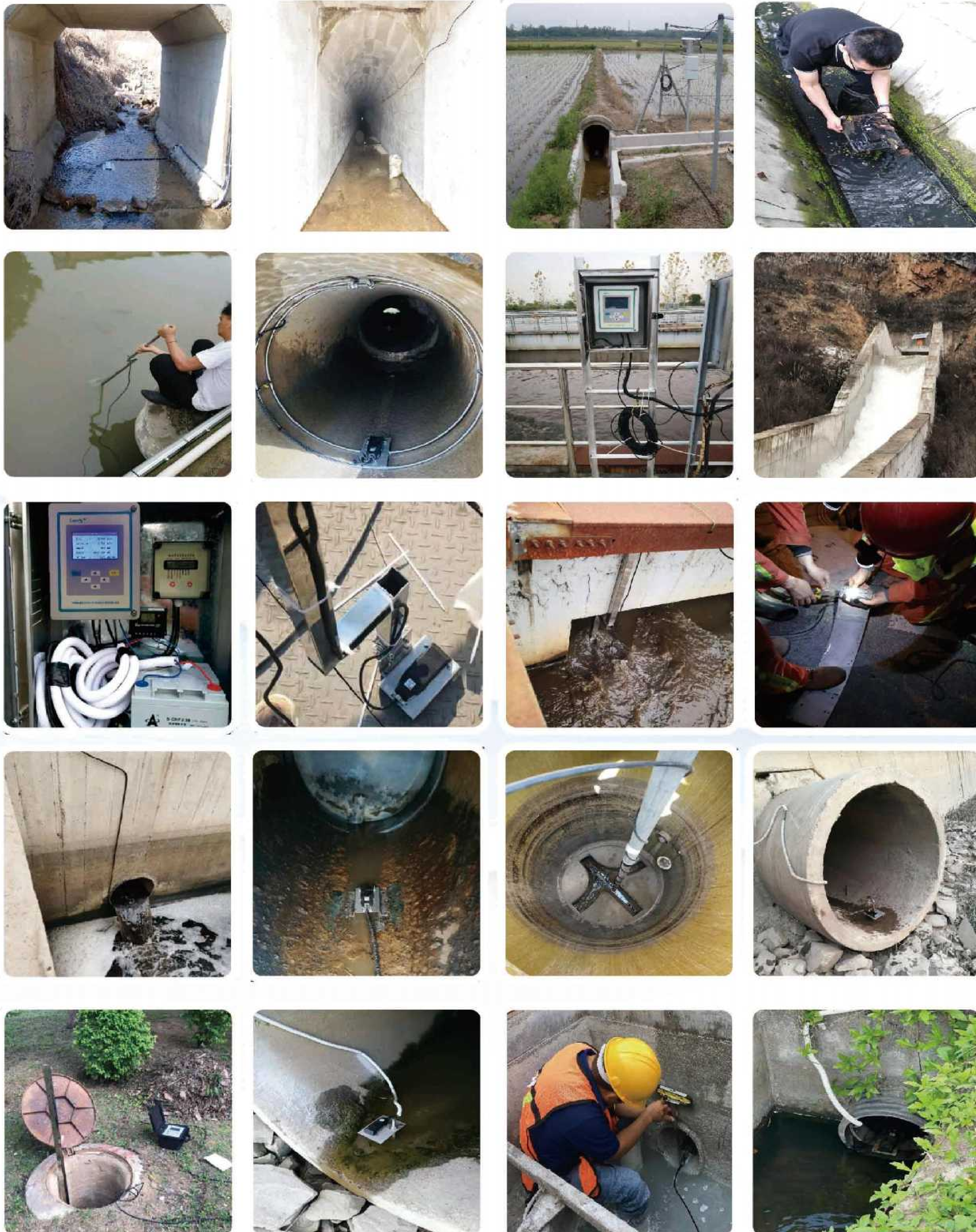
Description:

Wall mounted Doppler Open Channel Flowmeter; Power supply: 85-265VAC; output:none; Sensor level range: 0-10m; 15m sensor cables.

DOF6000 Sensor Installation Details:



Application Pictures:



Lanry | Professional Manufacturer
Of Flow Meters