PRISMA Instruments
& Gauge Bourdon France

DUS-CC

ULTRASONIC HEAT FLOW METERS

FIXED

FEATURES

- Types : Fixed or Portable
- Transducers : Non-invasive Clamp-on or Insertion type
- Pt1000 : Non-invasive Clamp-on or Insertion type
- For Pipe DN20 to DN4500
- Accurate Internally configured batch controller
- No moving parts, No pressure drop, No maintenance
- Easy and economical installation, hot-tapped installation
- Daily, monthly and yearly totalized flow (up to 5 years)
- RS48 Modbus RTU, 4-20 mA, Frequency, Electric Relay...
- Internal Data Logger

PORTABLE

ULTRASONIC HEAT FLOW METERS
Series : DUS-CC

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APPLICATIONS

- Measuring heat flow
- Sewage and drainage water (small particle quantity)
- Beverage and food processors
- HVAC hot and cool water
- Water and waste treatment
- Power plants, heat energy boiler feed water
- Energy consumption supervision
- Water conservation management
- Metallurgy and miming applications
- Pipeline leak detection, inspection & collection
- Energy measurement and balancing
- Network monitoring

Heat Meter Models & Accessory

DESCRIPTION

Prisma Instruments **DUS-CC** Series Ultrasonic heat flow meters adopt the MultiPulseTM Technology, Digital Signal Processing Technology and Error Correction Technology, which are the state-of-the-art non-invasive flow measurement technology, with a measuring system of very high accuracy, versatility, low cost of installation and ownership.

The meter can calculate automatically caloric content of water under 0 °C ~200 °C temperatures, and can obtain instantaneous caloric value and totalized caloric value.
The pipe range should be DN20-4500 (DN65-2500 for Insertion and DN20-2500 for Flanged series).

SPECIFICATIONS

HEAT METER	Type	FIXE - PORTABLE - ATEX
	Power Supply	90-240VAC 50/60Hz ±15%, 5VA max. 10 - 28 VDC, 2.5VA max. Solar supply 12VDC
	Velocity	-40 ~ 40 ft/s (0 ~ 12m/s), bi-directional
	Display	4 line×16 English letters LCD back lit, can display total flow - flow rate - velocity and meter running status etc.
	Units Rate Totalized	User Configured (English and Metric) Rate and Velocity Display (FWD, NET, REV or BATCH) gallons, ft^3, barrels, lbs, liters, m^3,kg
	Outputs	4~20mA, Frequency, Relay, RS232C or RS485(Modbus) options: Hart +(4~20mA), ZigBee, GPRS
	Accuracy	±1.0% of reading at rates >0.5 m/s ±0.005 m/s of reading at rates<0.5 m/s
	Sensitivity	±0.005 m/s of reading at rates<0.5 m/s
	Repeatability	0.2% of reading
	Dimensions and Weight	Std.:261*193*80, Weight: <2.5kg Exp: 310*226*127, Weight: <7.5kg
	Security	eypad lockout, access code enable
TRANSDUCERS	Liquid Types Supported	Virtually most any liquid containing less than 2% total suspended solids (TSS) or aeration
	Suited Liquid Temperature	Std. Temp.: -40℃~121℃ High Temp.: -40℃~250℃
	Cable Length	Std: 6m (20 feet); Opt: Maximum: 300m (990 feet)
	Pipe Size	S transducer: DN20-50mm M transducer: DN40 -1000mm L transducer: DN1000-4500mm K transducer (mode round): DN20-50mm Note : For K, S transducer on the stainless steel pipe, It is better that the thickness of the pipe is more than 2.5mm. If not, please consult us, we have another solve plan.
	Dimensions and weight	S: Size:42*25*25; weight:<0.2kg M: Size:60*43*43; weight:<0.5kg L: Size:80*53*53; weight:<1.0kg
PT1000	Temperature	0℃~200℃
	Type	Clamp-on or Insertion
	Accuracy	±0.1%

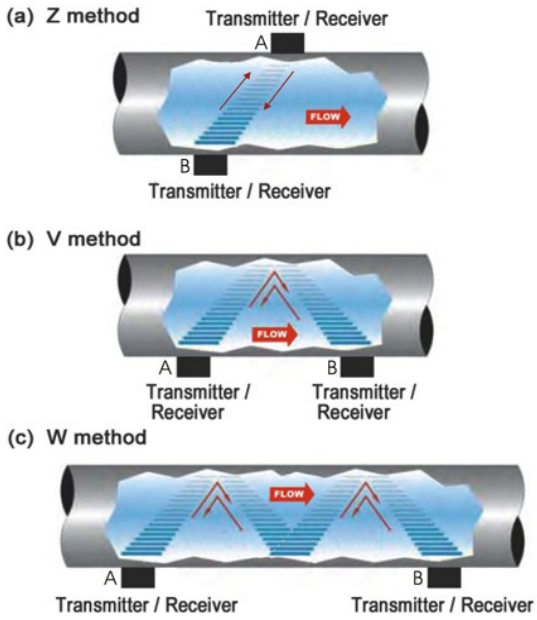
PRINCIPE OF MEASUREMENT

Prisma Instruments Heat Flow Meter is designed to measure the fluid velocity and temperature of liquid within a closed pipe. The transducers are a non-invasive, clamp-on type, which will provide benefits of non-fouling operation and easy installation. The temperature sensors are Pt1000 and have high accuracy.

When measuring velocity, the **DUS-CC** transit time heat meter use two transducers that function as both ultrasonic transmitters and receivers. The transducers are clamped 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 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 heat meter operates by alternately transmitting and receiving a frequency modulated burst of sound energy between the two transducers and measuring the transit time that it takes for sound to travel between the two transducers. The difference between the transit-time is directly and exactly related to the velocity of the Liquid in the pipe, as shown in ***Figure1***.

Figure1



$$V = K * D * \Delta t$$

V: Liquid velocity

K: Constant

D: Distance between the two transducers

Δt : Difference in time of flight

When measuring temperature, the two temperature sensors of Pt1000 clamp on the pipeline or insert in the pipe, and get two temperature values.

The value of energy is indicated / measured based on the following mathematical model :

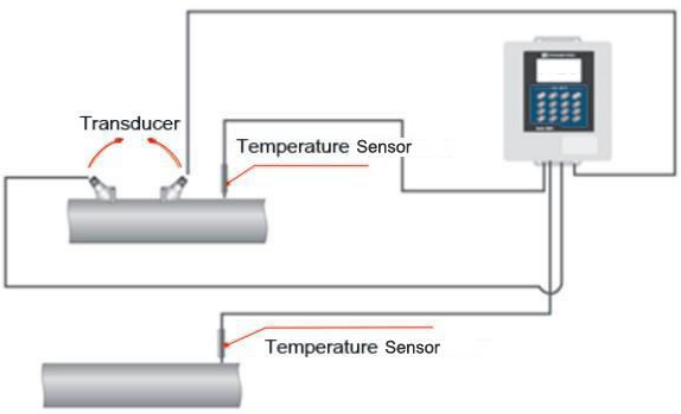
$$Q = \int_{V2}^{V1} k(t1 - t2)dV$$

Where: **Q** – Volume of heat taken

V – Volume of flowing water

k – Heat coefficient of water

t1 – Inlet temperature of water



ULTRASONIC HEAT FLOW METERS
Series : DUS-CC

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PARTS IDENTIFICATION

TRANSMITTERS


Standard wall-mounted


Portable Version


Explosion-proof (ATEX)

TRANSDUCERS


Clamp-on


Round-Clamp (Type K)


High Temperature


Ex-proof (ATEX)


Insertion Type


Flanged Type

TEMPERATURE SENSOR


Clamp-on Pt1000


Insertion Pt1000

ACCESSORIES


Stainless Steel Strap


Flexible Belts

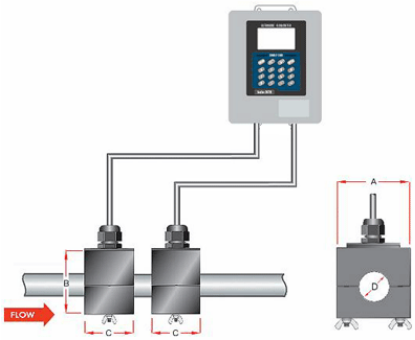
Couplant


Mounting Frame

K TRANSDUCER

K transducers utilize the Round-Clamp method, and the transducers' transmitting and receiving sides are connected with the pipe surface thoroughly to acquire enough coupling area, better reliability, stability, etc.
Useful when you have small pipes for example.

Size	Material	Pipe (mm)
K1 : 3/4" ~ 1"	PTFE	20-25
K2 : 3/4" ~ 1" ~ 1-1/4"	PTFE	20-32
K3 : 1-1/4" ~ 1-3/4" ~ 2"	PTFE	32-50



ORDERING INFORMATION

Reference model : *DUS-CC* X X X X / Transducers

Model
F - Fixe
P - Portable
Ex—ATEX (ExdIIBT6)

Power Supply
A - 110VAC
B - 220VAC
E - 24VDC
S - Solar supply (including solar board)

Output Selection (max. 4 can be selected)
0 - Data Storage
1 - 4-20mA
2 - Frequency Output (Flow rate)
3 - Electric Relay (Totalizer or Alarm)
4 - RS232
5 - RS485 (ModBus-ASCⅡ)
6 - RS485 (ModBus-RTU)
7 - Hart+(4-20mA) (2 loops)
8 - Data Logger & Software
9 - GPRS Wireless Module (Excluding software)
10 - ZigBee Wireless Module

Temperature Sensor
C1 - Pt1000 Clamp-on(20-1000mm) (0～200℃) Two-wire system temperature sensor input
C2 - Pt1000 Insertion(100-2500mm) (0～200℃) Two-wire system temperature sensor input

TRANSDUCER

Reference transducers : *DB X X X X X*

Transducer Type

S - Small (DN20-50)
M - Medium (DN40-1000)
Ex-M - Ex-proof Medium (DN40-1000)
L - Large (DN1000-4500)
Kxx - K Small-Pipe Round Clamp-on (DN20-50), xx is inside Diameter.
(Above transducers material is PTFE, if you need stainless steel transducers, please contact us)

Transducer Mounting Frame

N - None
FS - for DN20-50
FM - for DN50-1000

Transducer Temperature

N - - 40～121℃
H - - 40～250℃(Only for S,M transducer. If larger transducer, consult us.)

Mounting Type

N - Common
M - Magnetic (suitable for pipe above DN80)

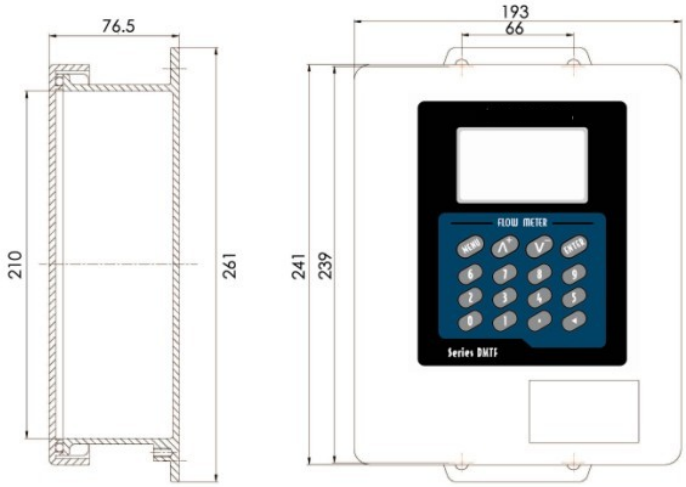
Pipeline Diameter

DNX – DN20 to DN4500

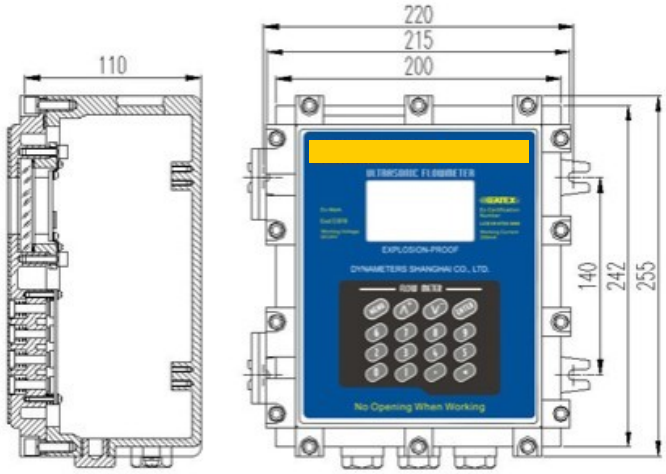
Cable Length

Xm - Common cable, Max 300m
XmH - High temp. cable Max 300m

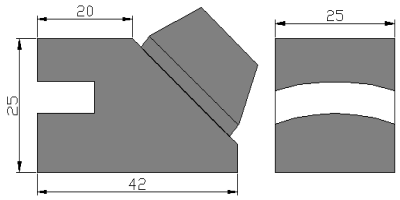
DIMENSIONS



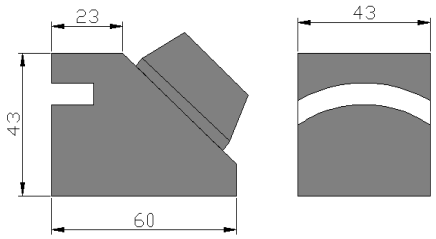
Standard Transmitter



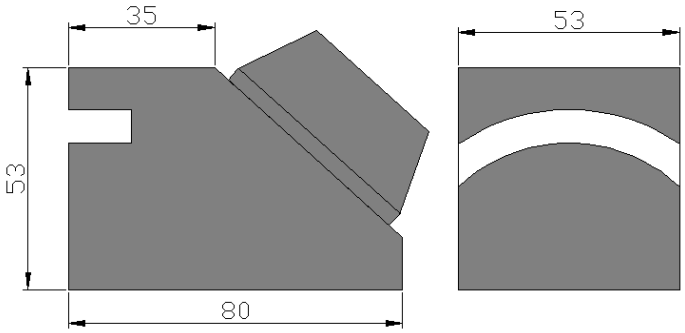
Explosion-proof Transmitter



S Transducer



M Transducer



L Transducer