



# Ultrasonic Gas Metering Solutions



Cubic Sensor and Instrument Co.,Ltd.

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## Introduction

Cubic offers an ultrasonic gas flow meter solution renowned for its exceptional accuracy and reliability. It employs ultrasonic technology which could achieve long-term accuracy without accuracy degrade. This solution is well-suited for various applications, including natural gas custody transfer and the precise measurement of process gases across different industries.

The gas pass through pipeline each day, which makes the precise measurement of gas flow important for reduce economic losses. Challenging ambient conditions, including variations in temperature, pressure, and dust levels, significantly impact measurement accuracy.

By incorporating pressure and temperature sensors internally and conducting volume conversion following the NX-19 mod standard, Cubic's ultrasonic gas flow meter ensures consistently high performance, delivering standardized flow readings without the necessity for supplementary flow volume correction equipment.

Equipped with an integrated wireless communication module, the flow meter enables remote recharging, data monitoring, and operational status diagnostics, furnishing users with a comprehensive measurement solution and an intelligent management experience. Its built-in diagnostic functionality enables continuous monitoring of the flow meter's status and the immediate triggering of abnormal alarms.

Cubic flow meter also features a robust stainless meter body incorporating titanium alloy transducers with good corrosion resistance, performs measurement with high noise immunity and long-term stability. Ultrasonic measurement features no moving parts, ensuring minimal wear and tear and consequently, nearly maintenance-free operation.



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## Applications

- LNG industry
- Gas processing plants
- In-plant metering
- Power plants
- Underground natural gas storage
- Custody transfer measurement
- Measurement and regulation stations
- Gas compressor control

# Features



## High Reliability

- Multipath design detects multiple flow profiles, eliminating turbulence and asymmetric gas flow impact.
- Multipath provides the necessary redundancy capability, and the unique channel substitution technology enables the flow meter to operate reasonably well even in the event of a failure in one channel.
- Titanium alloy transducer employed possesses corrosion resistance, high-pressure resistance, and anti-contamination.



## High Performance

- Wide turn-down ratio and excellent repeatability ensure stable measurement in the real-world conditions.
- Temperature and pressure sensors ensure accurate gas flow measurement under various temperature and pressure conditions.



## Low Running Cost

- No pressure loss and ultra-low starting flow ensures monitoring of minimal gas consumption.



## Maintenance-Free

- No mechanical parts means no wear and tear and maintenance-free.



## Convenient Maintenance

- Detachable transducer design for easy periodic maintenance and cleaning.



## Smart Monitoring

- Integrated wireless module allows easy remote monitoring and meter status management.



## Automatic Self-Diagnostics

- The information of the self-diagnostics is logged in the meter to allow a retroactive check of the measurement process and uploaded to server. Alarming signal will be founded in the server software interface to allow the maintenance on time and easy reason analysis, reducing equipment failures and downtime.



## Versatile Power Supply

- Wired power supply with lithium battery for backup enhances system reliability.

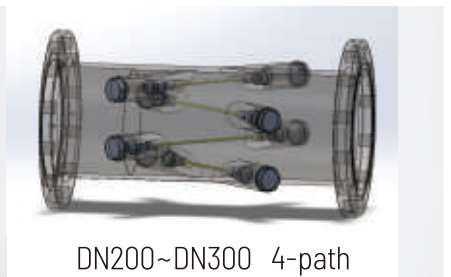
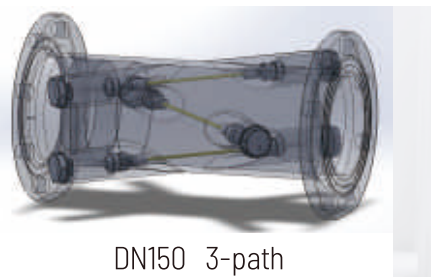
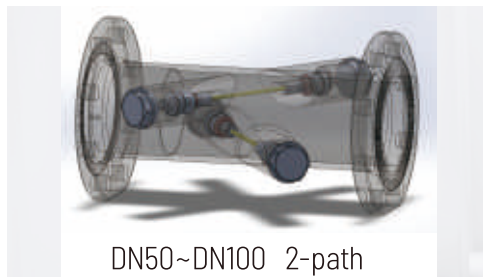


## Communication Protocol for Industrial Application

- Supports both 4-20mA and Modbus communication simultaneously, providing a diversity of data transmission options.

## Available in Three Types of Measuring Path

Various models with distinct numbers of measuring paths allow for adaptability to different flow rates and a diverse range of process applications, ensuring optimal cost-effectiveness.



## Measuring Ranges

"Cubic ultrasonic gas flow meter is designed for precise measurement of transmission system and custody transfer, complete range from DN 50 up to DN 300. Its ultrasonic technology is based on the transit time measurement, which offers many benefits : no moving parts, no pressure loss, wide measuring range, low start flowrate and insensitiveness to suspended particles."

Nominal Size		Flow Rate			
DN	Inches	m <sup>3</sup> /h		ft <sup>3</sup> /h	
		Min	Max	Min	Max
50	2	3.2	160	113	5650
80	3	8	400	283	14126
100	4	10	600	353	21189
150	6	25	1300	883	45909
200	8	40	2000	1413	70629
250	10	75	3000	2649	105944
300	12	100	4000	3531	141259

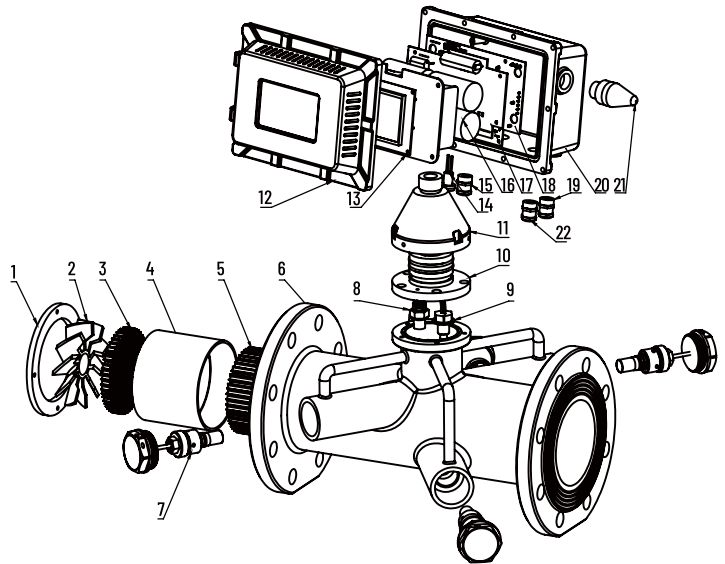
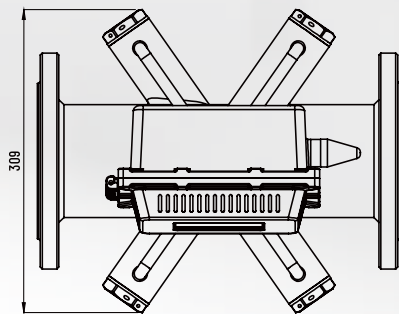
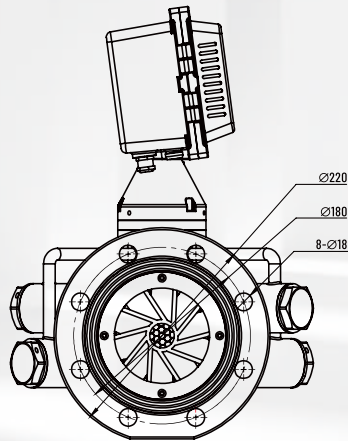
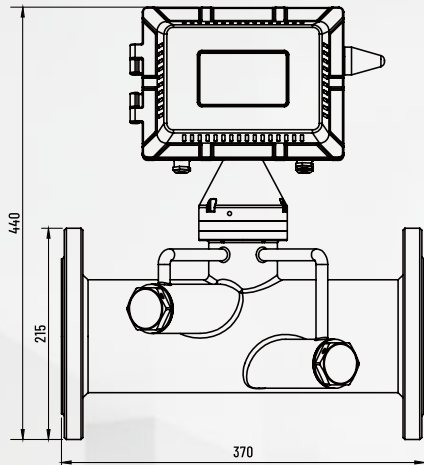
Flange Connection*						
DN	Standard	Outer Diameter of the Tube(mm)	Outer Diameter of the Flange(mm)	Flange Thickness(mm)	Screw	
					Number	Size
50	PN16	57	165	20	4	M16
80	PN16	89	200	20	8	M16
100	PN16	108	220	22	8	M16
150	PN16	159	285	24	8	M20
200	PN16	219	340	26	12	M20
250	PN16	273	405	29	12	M24
300	PN16	325	460	32	12	M24

Working Temperature			Working Pressure		
DN	Ambient Temperature	Medium Temperature	Ambient Atmospheric Pressure	Working Pressure	Max. Pressure Resistance
50	(-25~55)°C	(-20~60)°C	(86~106) kPa	≤0.8MPa	1.6MPa
80	(-25~55)°C	(-20~60)°C	(86~106) kPa	≤0.8MPa	1.6MPa
100	(-25~55)°C	(-20~60)°C	(86~106) kPa	≤0.8MPa	1.6MPa
150	(-25~55)°C	(-20~60)°C	(86~106) kPa	≤0.8MPa	1.6MPa
200	(-25~55)°C	(-20~60)°C	(86~106) kPa	≤0.8MPa	1.6MPa
250	(-25~55)°C	(-20~60)°C	(86~106) kPa	≤0.8MPa	1.6MPa
300	(-25~55)°C	(-20~60)°C	(86~106) kPa	≤0.8MPa	1.6MPa

\* We use PN16 as our standard flange connection, we could also customize the flange connection based on specific project needs.

# DN100 Dimension Diagram

# Product Diagrams



No.	Part Name
1	Rectifier Ring
2	Spinner
3	Cellular Rectifier 1
4	Rectifier Housing
5	Cellular Rectifier 2
6	Double-flanged Pipeline
7	Ultrasonic Transducer
8	Pressure Sensor
9	Temperature Sensor
10	Meter Controller Base
11	Rotating Base
12	Meter Controller Case Cover
13	LCD Display
14	Button
15	External Power Supply Aviation Plug
16	Lithium Battery
17	Main Control Board
18	Metering Control Board
19	RS485/4-20mA Interface
20	Meter Controller Button Case
21	Explosion-Proof Antenna
22	Valve Aviation Plug

# DN100 Specifications

Ultrasonic Gas Flow Meter	
Specification	DN100
Flow Range	10~600m <sup>3</sup> /h
Accuracy	Class 1.0
Boundary Flow	Qt = 60m <sup>3</sup> /h
Indication Error	Q <sub>min</sub> ≤ Q < Q <sub>t</sub> , ≤ ± 2.0% Q <sub>t</sub> ≤ Q ≤ Q <sub>max</sub> , ≤ ± 1.0%
Flow Medium	Single-phase gas: natural gas, liquefied petroleum gas, air, etc.
Medium Temperature	(-20~60)°C
Nominal Pressure	≤ 1.6MPa
Work Pressure	≤ 0.6MPa
Ambient Temperature	(-25~55)°C
Power Supply	External power 24VDC, built-in lithium battery 3.6V
Wireless Communication	GPRS
LCD	Accumulated total volume (standard condition), instantaneous flow rate under standard condition, instantaneous flow rate under working condition, temperature, pressure, battery power, etc.
Installation Method	Flange
Transducer Material	Titanium Alloy
Power Consumption	≤ 5W
Transducer Frequency	200KHZ
Analog Output	4~20mA
Frequency/Pulse Output	One-channel frequency/pulse output
Communication Interface	RS485
Communication Protocol	Modbus-RTU
Data Storage Duration	The historical records include hourly, daily, monthly data, and alarm records, with a minimum retention period of 96 months for monthly data and alarm data.
Protection Level	IP65
Explosion Proof	Exd II BT6 Gb

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