SHANGHAI PANDA MACHINERY GROUP

บริษัท ไอเอ็มซี อินดัสทรี จำกัด
IMC Industry Company Limited

Panda Smart Meter

Selection Brochure

- ✓ Residential Ultrasonic Water Meter
- ✓ Bulk Ultrasonic Water Meter
- ✓ Smart Integrated Ultrasonic Water Meter
- ✓ Transit-time Ultrasonic Flow Meter

- ✓ Doppler Ultrasonic Flow Meter
- ✓ Electromagnetic Flow Meter
- ✓ Ultrasonic Level Meter
- ✓ Partially Filled Pipe & Open Channel Flow Meter

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Panda PWM-S Residential Series
Residential Ultrasonic Water Meter DN15-DN25

Features ≫

- Full Stainless Steel Body . Can Be Used For High-Quality Direct Drinking Water Metering
- Wide Range
- Measuring Low Starting Flow
- No Moving Parts, Accuracy Will Not Change After Long Term Working
- With Functions of Self-diagnosis, Flow Sensor Alarm, Temperature Sensor Alarm, Over Range Alarm and Battery Undervoltage Alarm
- Low Consumption Design, Battery Can Continuously Work For 6 Years
- With Optic Electric Interface, Hand-held Infrared Meter Reading Tool Can Read Directly
- Upload Time Can Be Set According To User Specified Time, Integrated Multiple Intelligent Alarm Functions For Abnormal Water Consumption, Open Protocol Is More Suitable For Compatible Extension
- Bi-directional Measuring Forward And Reverse Flow
- According To Sanitary Standard For Drinking Water

Technical Specification ≫

Max. Working Pressure	1.6Mpa
Temperature Class	T30
Accuracy Class	ISO 4064, Accuracy Class 2
Body Material	Stainless Steel 304 (opt. SS316L)
Battery Life	6 Years(Consumption≤0.3mW)
Protection Class	IP68
Environmental Temperature	-40℃～+70℃,≤100%RH
Pressure Loss	∆P25
Climatic And Mechanical Environment	Class O
Electromagnetic Class	E2
Communication	Wired M-bus, RS485, Wireless LoRaWAN
Display	9 digits multi-line LCD display. Can display cumulative flow (m^3, L, GAL), instantaneous flow (m^3/h, L/min, GPM), battery alarm, flow direction, output etc.
Connection	Thread
Flow Profile Sensitivity Class	U5/D3
Data Storage	Store the data, including day, month, and year for latest 24 months.The data can be permanently saved even powered off
Frequency	1-4 times/second

Panda PWM-S Residential Series
Residential Prepaid Ultrasonic Water Meter DN15-DN25

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Features »»

- Full Stainless Steel Body. Can Be Used For High-Quality Direct Drinking Water Metering
- Integrated Meter And Valve, Fully Enclosed Structure, Anti-vandalism
- Wide Range
- Measuring Low Starting Flow
- No Moving Parts, Accuracy Will Not Change After Long Term Working
- With Functions of Self-diagnosis, Flow Sensor Alarm, Temperature Sensor Alarm, Over Range Alarm, Battery Undervoltage Alarm and Valve Error Alarm
- Low Consumption Design, Battery Can Continuously Work For 6 Years
- With Optic Electric Interface, Hand-held Infrared Meter Reading Tool Can Read Directly
- Support Remote Valve Controlled By Revenue Platform System
- Bi-directional Measuring Forward And Reverse Flow
- According To Sanitary Standard For Drinking Water

Technical Specification »»

Max. Working Pressure	1.6Mpa
Temperature Class	T30
Accuracy Class	ISO 4064, Accuracy Class 2
Body Material	Stainless Steel 304 (opt. SS316L)
Battery Life	6 Years(Consumption≤0.3mW)
Protection Class	IP68
Environmental Temperature	-40°C～+70°C, ≤100%RH
Pressure Loss	ΔP25
Climatic And Mechanical Environment	Class O
Electromagnetic Class	E2
Communication	Wired M-bus, RS485, Wireless LoRaWAN
Display	9 digits multi-line LCD display. Can display cumulative flow (m³, L, GAL), instantaneous flow (m³/h, L/min, GPM), battery alarm, flow direction, output etc.
Connection	Thread
Flow Profile Sensitivity Class	U5/D3
Data Storage	Store the data, including day, month, and year for latest 24 months.The data can be permanently saved even powered off
Frequency	1-4 times/second

Panda PWM-S Residential Series
Residential Ultrasonic Water Meter DN15-DN25

Residential Ultrasonic Water Meter Display >>>

Symbol	Meaning	Symbol	Meaning
°C	Temperature		Testing Mode
	Battery		Alarm

	Empty Pipe Alarm	Lm³/h	Flow Unit		Leakage		Burst Pipe		Flow Direction

Residential Prepaid Ultrasonic Water Meter Display >>>

Symbol	Meaning	Symbol	Meaning
°C	Temperature		Balance
	Recharge Amount		Recharge Reminder

	Testing Mode		Battery		Alarm		Empty Pipe Alarm	Lm³/h	Flow Unit

	Valve Closing Indication		Leakage		Burst Pipe		Flow Direction

· Measuring Range and Dimensions (R250)

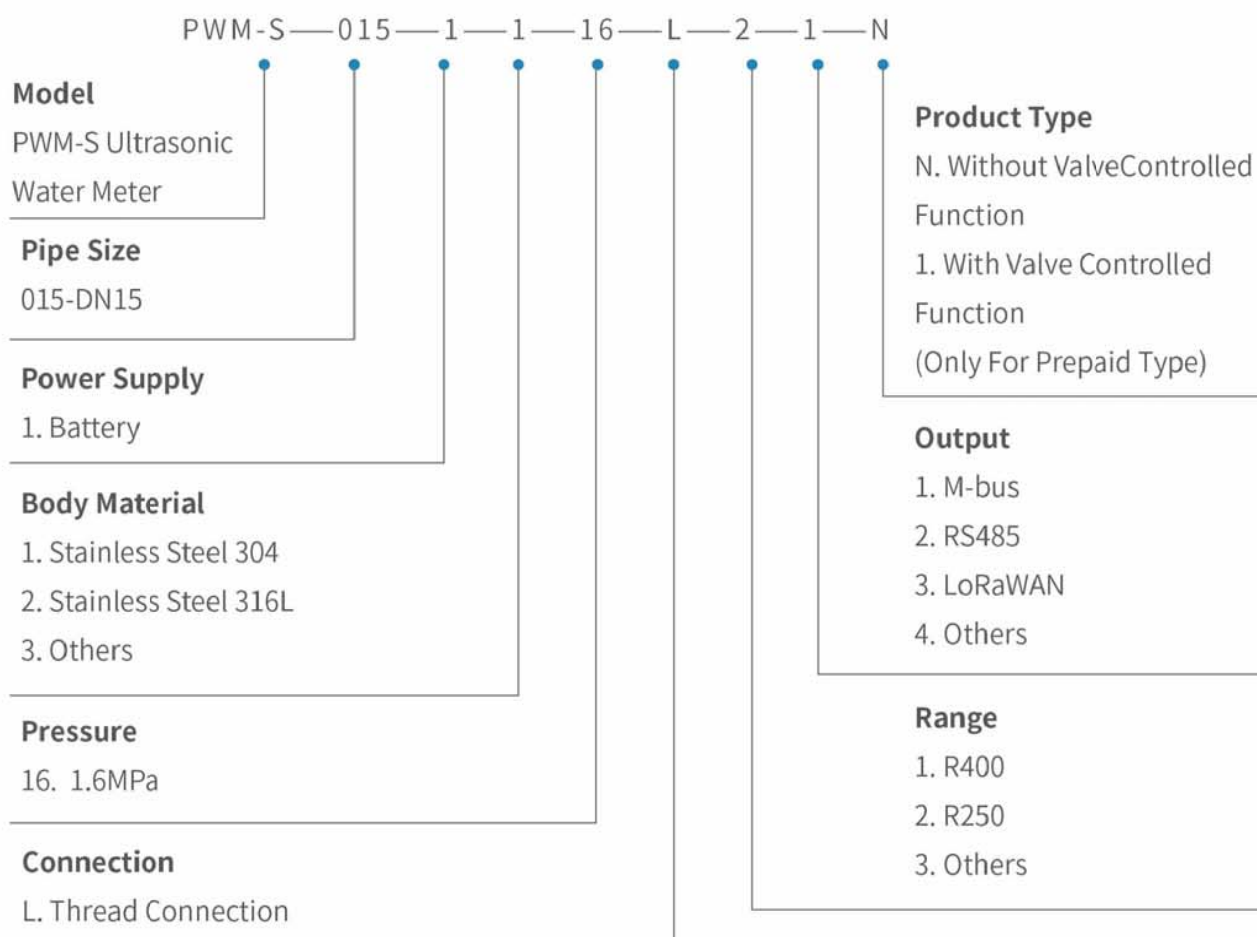| Model	PWM-S									
Nominal Diameter	Permanent Flow Q3	Transitional Flow Q2	Minimum Flow Q1	Installation without connection accessories (A)	Installation with connection accessories (B)	L	L1	H	Length of connection accessories (S)	W
DN(mm)	(m³/h)	(m³/h)	(m³/h)			mm	mm	mm	mm	mm
15	2.5	0.016	0.010	G¾B	R½	165	135	82	53.8	96
20	4.0	0.026	0.016	G1B	R¾	195	157	90	60	100
25	6.3	0.040	0.025	G1¼B	R1	225	165	96	70	100

Panda PWM-S Residential Series
Residential Ultrasonic Water Meter DN15-DN25

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·Measuring Range and Dimensions (R400)

Model	PWM-S										
Nominal Diameter	Permanent Flow Q3	Transitional Flow Q2	Minimum Flow Q1	Installation without connection accessories (A)	Installation with connection accessories (B)	L	L1	H	Length of connection accessories (S)	W	
DN(mm)	(m³/h)	(m³/h)	(m³/h)			mm	mm	mm	mm	mm	
15	2.5	0.010	0.006	G¾B	R½	165	135	82	53.8	96	
20	4.0	0.016	0.010	G1B	R¾	195	157	90	60	100	
25	6.3	0.025	0.016	G1¼B	R1	225	165	96	70	100	

Model Selection ⟫

PWM-S — 015 — 1 — 1 — 16 — L — 2 — 1 — N

Model
PWM-S Ultrasonic Water Meter

Pipe Size
015-DN15

Power Supply
1. Battery

Body Material
1. Stainless Steel 304
2. Stainless Steel 316L
3. Others

Pressure
16. 1.6MPa

Connection
L. Thread Connection

Product Type
N. Without ValveControlled Function
1. With Valve Controlled Function
(Only For Prepaid Type)

Output
1. M-bus
2. RS485
3. LoRaWAN
4. Others

Range
1. R400
2. R250
3. Others

For Example：PWM-S-015-1-1-16-L-2-1-N

Stands for：PWM-S Ultrasonic Water Meter, pipe size DN15, battery power supply, stainless steel 304, pressure 1.6Mpa, thread connection, R250, M-BUS output, without valve controlled function.

Panda PWM-S Series
Ultrasonic Water Meter DN32-DN40

Features »»»

- With Rectifier Function, Low Installation Requirement of Straight Pipe
- Dual Channel Structure, Wide Range
- Suitable For Mass Flow And Tiny Flow Measurement
- The Integrated Design Of Flow, Pressure And Wireless Reading Meets Monitoring Pipeline Requirements
- Configured With Remote Data Collector, Remotely Connect To Smart Metering Platform
- IP68 Protection Class, To Ensure Long Term Underwater Working
- Low Consumption Design, Double D Size Batteries Can Continuously Work For 15 Years
- Bi-directional Measuring Forward And Reverse Flow
- Data Storage Function Can Save 10 Years' Data Including Day, Month and Year
- 9 Digits Multi-line LCD Display. Can Display Cumulative Flow, Instantaneous Flow, Flow, Pressure, Temperature, Error Alarm, Flow Direction etc. At The Same Time.
- Standard RS485(Modbus) And OCT Pulse, A Variety Options of NB-IoT GPRS etc.
- Stainless Steel 304 Pipe Which Is Tensile Molding Patent, Electrophoresis With Anti-Scaling
- According To Sanitary Standard For Drinking Water

Technical Specification »»»

Max. Working Pressure	1.6Mpa
Temperature Class	T30、T50、T70、T90 (Default T30)
Accuracy Class	ISO 4064, Accuracy Class 2
Body Material	Stainless Steel 304 (opt. SS316L)
Battery Life	15 Years(Consumption≤0.3mW)
Protection Class	IP68
Environmental Temperature	-40℃～+70℃,≤100%RH
Pressure Loss	ΔP10, ΔP16 (Based on different dynamic flow)
Climatic And Mechanical Environment	Class O
Electromagnetic Class	E2
Communication	RS485(baud rate is adjustable);Pulse, Opt. NB-IoT、GPRS
Display	9 digits multi-line LCD display. Can display cumulative flow, instantaneous flow, flow rate, pressure, temperature, error alarm, flow direction etc. at the same time
RS485	Default baud rate 9600bps (opt. 2400bps, 4800bps), Modbus-RTU
Connection	Thread
Flow Profile Sensitivity Class	U3/D0
Data Storage	Store the data, including day, month, and year for 10 years.The data can be permanently saved even powered off
Frequency	1-4 times/second

Ultrasonic Water Meter DN32-DN40

· Measuring Range

Model		PWM-S	
Nominal Size	(mm)	32	40
	(inch)	1 ¼"	1 ½"
Overload Flow Q4(m³/h)		20	31.25
Permanent Flow Q3(m³/h)		16	25
Transitional Flow Q2(m³/h)		0.051	0.08
Minimum Flow Q1(m³/h)		0.032	0.05
R=Q3/Q1		500	
Q2/Q1		1.6	

· Dimensions & Weight

Model		PWM-S		
Nominal Diameter	(mm)	32	40 (Optimization)	40
Installation without connection accessories (A)		G1½B	G1¾B	G1¾B
Installation with connection accessories (B)		G1¼	G1½	G1½
L (mm)		260	300	245
L1 (mm)		185	185	185
H (mm)		201	206	206
W (mm)		140	140	140
Length of connection accessories (S)		73.8	76.9	76.9
Weight (kg)		3.8	4.3	3.8

Remarks: Other length of pipe can be customized.

Panda PWM-S Series
Ultrasonic Water Meter DN32-DN40

Model Selection ≫

PWM-S—040—1—1—16—L—1—1—1—N

Model

PWM-S Ultrasonic
Water Meter

Pipe Size

032-DN32

040-DN40

Power Supply

1. Battery

2. 24VDC+ Battery

Body Material

1. Stainless Steel 304

2. Stainless Steel 316L

Pressure

16. 1.6MPa

Others

Connection

L. Thread Connection

Q. Others

Meter Length

N Standard

L Customized

Optional Function

N. None

1. Pressure Measurement

2. Built-in Remote Reading
   Function

3. Pressure Measurement &
   Built-in Remote Reading Function

Output

1. RS485+OCT Pulse
   (standard)

2. Others

Range

1. R500

2. R400

3. Others

For Example：PWM-S-040-1-1-16-L-1-1-1-N

Stands for：PWM-S ultrasonic water meter, pipe size DN40, battery power supply, stainless steel 304, pressure 1.6Mpa, thread connection, R500, RS485 output, with pressure measurement function, standard length.

Panda PWM Series
Bulk Ultrasonic Water Meter DN50-DN300

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Features »»

- With Rectifier Function, Low Installation Requirement of Straight Pipe
- Wide Range
- Suitable For Mass Flow And Tiny Flow Measurement
- The Integrated Design Of Flow, Pressure, Wireless Reading Meets Monitoring Pipeline Requirement
- Configured With Remote Data Collector, Remotely Connect To Smart Metering Platform
- IP68 Protection Class, To Ensure Long Term Underwater Working
- Low Consumption Design, Double D Size Batteries Can Continuously Work For 15 Years
- Bi-directional Measuring Forward And Reverse Flow
- Data Storage Function Can Save 10 Years' Data Including Day, Month And Year
- 9 Digits Multi-line LCD Display. Can Display Cumulative Flow, Instantaneous Flow, Flow, Pressure, Temperature, Error Alarm, Flow Direction etc. At The Same Time.
- Standard RS485(Modbus) And OCT Pulse, A Variety Of Options, NB-IOT, GPRS etc.
- Stainless Steel 304 Pipe Which Is Tensile Molding Patent, Electrophoresis With Anti-scaling
- According To Sanitary Standard For Drinking Water

Technical Specification »»

Max. Working Pressure	1.6Mpa
Temperature Class	T30、T50、T70、T90 (Default T30)
Accuracy Class	ISO 4064, Accuracy Class 2
Body Material	Stainless Steel 304 (opt. SS316L)
Battery Life	15 Years(Consumption≤0.3mW)
Protection Class	IP68
Environmental Temperature	-40℃～+70℃, ≤100%RH
Pressure Loss	ΔP10, ΔP16 (Based on different dynamic flow)
Climatic And Mechanical Environment	Class O
Electromagnetic Class	E2
Communication	RS485(baud rate is adjustable);Pulse, Opt. NB-IoT、GPRS
Display	9 digits multi-line LCD display. Can display cumulative flow, instantaneous flow, flow rate, pressure, temperature, error alarm, flow direction etc. at the same time
RS485	Default baud rate 9600bps (opt. 2400bps, 4800bps), Modbus-RTU
Connection	Flanges according to EN1092-1 (others customized)
Flow Profile Sensitivity Class	A Full Bore (U5/D3) B 20% Reduced Bore (U3/D0) C Reduced Bore (U0/D0)
Data Storage	Store the data, including day, month, and year for 10 years.The data can be permanently saved even powered off
Frequency	1-4 times/second

Panda PWM Series
Bulk Ultrasonic Water Meter DN50-DN300

·A (A2/A4) Full Bore Measuring Range (R500)

Model		PWM								
Nominal Size	(mm)	50	65	80	100	125	150	200	250	300
	(inch)	2	2.5	3	4	5	6	8	10	12
Overload Flow Q4 (m³/h)		78.75	125	200	312.5	312.5	500	787.5	1250	2000
Permanent Flow Q3 (m³/h)		63	100	160	250	250	400	630	1000	1600
Transitional Flow Q2 (m³/h)		0.202	0.320	0.512	0.800	0.800	1.280	2.016	3.200	5.120
Minimum Flow Q1 (m³/h)		0.126	0.200	0.320	0.500	0.500	0.800	1.260	2.000	3.200
R=Q3/Q1		500								
Q2/Q1		1.6								

·B 20% Reduced Bore Measuring Range (R1000)

Model		PWM								
Nominal Size	(mm)	50	65	80	100	125	150	200	250	300
	(inch)	2	2.5	3	4	5	6	8	10	12
Overload Flow Q4 (m³/h)		78.75	125	200	312.5	312.5	500	787.5	1250	2000
Permanent Flow Q3 (m³/h)		63	100	160	250	250	400	630	1000	1600
Transitional Flow Q2(m³/h)		0.101	0.160	0.256	0.400	0.400	0.640	1.008	1.600	2.560
Minimum Flow Q1 (m³/h)		0.063	0.100	0.160	0.250	0.250	0.400	0.630	1.000	1.600
R=Q3/Q1		1000								
Q2/Q1		1.6								

·C Reduced Bore Measuring Range (R500)

Model		PWM			
Nominal Size	(mm)	50	65	80	100
	(inch)	2	2.5	3	4
Overload Flow Q4 (m³/h)		50	78.75	78.75	125
Permanent Flow Q3 (m³/h)		40	63	63	100
Transitional Flow Q2 (m³/h)		0.128	0.202	0.202	0.320
Minimum Flow Q1 (m³/h)		0.080	0.126	0.126	0.200
R=Q3/Q1		500			
Q2/Q1		1.6			

Panda PWM Series
Bulk Ultrasonic Water Meter DN50-DN300

· Dimensions & Weight

Model		PWM								
Nominal Size	(mm)	50	65	80	100	125	150	200	250	300
	(inch)	2	2.5	3	4	5	6	8	10	12
L-Standard length (mm)		200	200	225	250	250	300	350	450	500
L-Custom length (mm)		280	/	370	370	/	500	500	/	/
B-Width (mm)		162	185	200	220	255	285	340	406	489
H-Height (mm)		258	277	293	307	334	364	409	458	512
h-Height (mm)		74	89	96	106	120	138	169	189	216
D×n		18×4	18×4	18×8	18×8	18×8	22×8	22×8	22×12	22×12
K (mm)		125	145	160	180	210	240	295	350	400
Pressure(MPa)		1.6	1.6	1.6	1.6	1.6	1.6	1.0	1.0	1.0
Weight (kg)		9	11.5	13	15	17	32	45	68	96

n:Bolt Hole Numbers   K:Bole Hole Diameter
Remarks: Other length of pipe can be customized

Panda PWM Series
Bulk Ultrasonic Water Meter DN50-DN300

Model Selection >>>

PWM——050—— B — 1 — 1 — 16 — F — 1 — 1 — 1 — L

Model

PWM Ultrasonic Water Meter

Pipe Size

050=DN50

300=DN300

Water Meter Type

A2 Full Bore Double Channel(U5/D3)

A4 Full Bore Four Channel(U5/D3)

B 20% Reduced Bore (U3/D0)

C Reduced Bore (U0/D0)

Power Supply

1. Battery

2. 24VDC+ Battery

Body Material

1. Stainless Steel 304

2. Stainless Steel 316L

Pressure

6. 0.6MPa

10. 1.0MPa

16. 1.6MPa

25. 2.5MPa

Others

Water Meter Length

N. Standard Length

L.Customized Length

Optional Function

N. None

1. Pressure Measurement

2. Built-in Remote Reading Function

3. Pressure Measurement & Built-in Remote Reading Function

Output

1. RS485 +OCT Pulse (Standard Configured)

2. Others

Range

1. R1000

2. R500

3. Others

Connection

F. Flange Connection

K. Clamp Connection

For Example: PWM-050-B-1-1-16-F-1-1-1-L

Stands for: PWM ultrasonic water meter, pipe size DN50, B 20% reduced bore water meter, battery power supply, stainless steel 304, pressure 1.6Mpa, flange connection, R1000, RS485 output, with pressure measurement function, customized length

Panda PWM Series
Bulk Ultrasonic Water Meter DN350-DN600

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Features >>>

- Full Bore Design, Without Pressure Loss
- Wide Range
- The Integrated Design Of Flow, Pressure, Wireless Reading Meets Monitoring Pipeline Requirement
- Configured With Remote Data Collector, Remotely Connect To Smart Metering Platform
- IP68 Protection Class, To Ensure Long Term Underwater Working
- Low Consumption Design, Double D Size Batteries Can Continuously Work For 15 Years
- Bi-directional Measuring Forward And Reverse Flow
- Data Storage Function Can Save 10 Years' Data Including Day, Month And Year
- 9 Digits Multi-line LCD Display. Can Display Cumulative Flow, Instantaneous Flow, Flow, Pressure, Temperature, Error Alarm, Flow Direction etc. At The Same Time.
- Standard RS485(Modbus) And OCT Pulse, A Variety Of Options, NB-IOT, GPRS etc.
- Stainless Steel 304 Pipe Which Is Tensile Molding Patent, Electrophoresis With Anti-scaling
- According To Sanitary Standard For Drinking Water

Technical Specification >>>

Max. Working Pressure	1.6Mpa
Temperature Class	T30、T50、T70、T90 (Default T30)
Accuracy Class	ISO 4064, Accuracy Class 2
Body Material	Stainless Steel 304 (opt. SS316L)
Battery Life	15 Years(Consumption≤0.3mW)
Protection Class	IP68
Environmental Temperature	-40°C～+70°C, ≤100%RH
Pressure Loss	ΔP10
Climatic And Mechanical Environment	Class O
Electromagnetic Class	E2
Communication	RS485(baud rate is adjustable)；Pulse, Opt. NB-IoT、GPRS
Display	9 digits multi-line LCD display. Can display cumulative flow, instantaneous flow, flow rate, pressure, temperature, error alarm, flow direction etc. at the same time
RS485	Default baud rate 9600bps (opt. 2400bps, 4800bps), Modbus-RTU
Connection	Flanges according to EN1092-1 (others customized)
Flow Profile Sensitivity Class	U5/D3
Data Storage	Store the data, including day, month, and year for 10 years.The data can be permanently saved even powered off
Frequency	1-4 times/second

Panda PWM Series
Bulk Ultrasonic Water Meter DN350-DN600

· Measuring Range (R500)

Model		PWM			
Nominal Size	(mm)	350	400	500	600
	(inch)	14	16	20	24
Overload Flow Q4 (m³/h)		2000	3125	5000	7875
Permanent Flow Q3 (m³/h)		1600	2500	4000	6300
Transitional Flow Q2 (m³/h)		5.12	8.00	12.80	20.16
Minimum Flow Q1 (m³/h)		3.20	5.00	8.00	12.60
R=Q3/Q1		500			
Q2/Q1		1.6			

· Measuring Range（R400）

Model		PWM			
Nominal Size	(mm)	350	400	500	600
	(inch)	14	16	20	24
Overload Flow Q4 (m³/h)		2000	3125	5000	7875
Permanent Flow Q3 (m³/h)		1600	2500	4000	6300
Transitional Flow Q2 (m³/h)		6.40	10.00	16.00	25.20
Minimum Flow Q1 (m³/h)		4.00	6.25	10.00	15.75
R=Q3/Q1		315			
Q2/Q1		1.6			

· Measuring Range (R250)

型号		PWM			
Nominal Size	(mm)	350	400	500	600
	(inch)	14	16	20	24
Overload Flow Q4 (m³/h)		2000	3125	5000	7875
Permanent Flow Q3 (m³/h)		1600	2500	4000	6300
Transitional Flow Q2 (m³/h)		10.24	16.00	25.60	40.32
Minimum Flow Q1 (m³/h)		6.40	10.00	16.00	25.20
R=Q3/Q1		250			
Q2/Q1		1.6			

Panda PWM Series
Bulk Ultrasonic Water Meter DN350-DN600

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· Dimensions & Weight
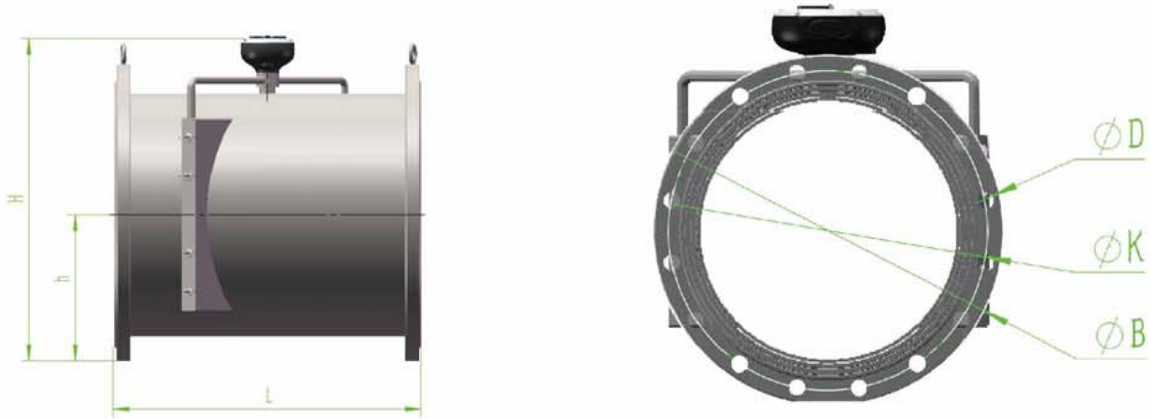
Model		PWM			
Nominal Size	(mm)	350	400	500	600
	(inch)	14	16	20	24
L-Length (mm)		500	600	600	800
B-Width (mm)		505	565	670	780
H-Height (mm)		593	648	743	853
h-height (mm)		245	275	328	378
D×n		22×16	26×16	26×20	30×20
K (mm)		460	515	620	725
Pressure (MPa)		1.0	1.0	1.0	1.0
Weight (kg)		112	138	169	220

Remarks: Other length of pipe can be customized

Panda PWM Series
Bulk Ultrasonic Water Meter DN350-DN600

Model Selection ≫

PWM —— 400 —— A4 —— 1 —— 1 —— 16 —— F —— 3 —— 1 —— 1

Model

PWM Ultrasonic
Water Meter

Pipe Size

400=DN400

500=DN500

Water Meter Type

A4 Full Bore Four-channel
(U5/D3)

Power Supply

1. Battery

2. 24VDC+Battery

Body Material

1. Stainless Steel 304

2. Stainless Steel 316L

Pressure

6. 0.6MPa

10. 1.0MPa

16. 1.6MPa

25. 2.5MPa

Others

Optional Function

N. None

1. Pressure Measurement

2. Built-in Remote Reading
Function

3. Pressure Measurement
& Built-in Remote Reading
Function

Output

1. RS485 +OCT Pulse (Standard
Configured)

2. Others

Range

1. R500

2. R400

3. R250

Connection

F. Flange Connection

For Example: PWM-400-A4-1-1-10-F-3-1-1

Stands for: PWM ultrasonic water meter, pipe size DN400, A4 Full Bore Four-channel water meter (U5/D3),
battery power supply, stainless steel 304, pressure1.0MPa, flange connection, R250, RS485 output, with
pressure measurement function

Panda PWM-Plus Series
Smart Integrated Water Meter

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Summary ≫

Smart integrated water meter utilizes transit-time principle. No need external power supply and suitable for various occasions without power supply. It effectively solves problems that water meters are often flooded, contaminated by silt, buried, and long time installation without water, covering a large area, long construction period, non-freezing, and easy to collapse etc. Its modular production, energy saving, environmental protection, recyclable use, quick installation, simple operation, widely applied in water supply and drainage, production monitoring, water balance test, energy-saving monitoring and other occasions.

Features ≫

- Multi-patent design, equipped with valve verification, more accurate measurement;
- Integrated meter and valve, fully sealed structure;
- Remote access is available by scanning code;
- Built-in antenna, more stable remote transmission;
- Convenient installation and construction;
- Waterproof, dustproof and damage proof;
- Long service life and recyclable;
- Reduce civil construction and labor costs;
- Modular production, energy conservation and environmental protection;

Technical Specification ≫

Box Material	PE、SMC
Temperature Class	T30、T50、T70、T90 (default T30)
Accessories Material	Pipes, valves and ultrasonic water meters are made of Stainless Steel SS304, Optional SS316L
Vertical Load-bearing	2t
Accuracy Class	ISO 4064, Accuracy class 2
Battery life	Water meter for 10 years；Data collector for 6 years (Upload every 24 hours)
Protection Class	IP68
Environmental Temperature	-40℃～+70℃, ≤100%RH
Pressure Loss	ΔP10
Climate And Mechanical Environment	Class O
Electromagnetic Class	E2
Communication	NB-IoT, 4G, Opt. RS485(baud rate adjustable); Pulse
Display	9 digits multi-line LCD display. Can display cumulative flow, instantaneous flow, flow rate,pressure, temperature, error alarm, flow direction, etc. at the same time
Data Storage	Store the latest 10 years' data including Day, Month and Year. The data can be permanently saved even powered off
Frequency	1-4 times / second
Connection	Std. Clamp Connection, Opt. Flange Connection

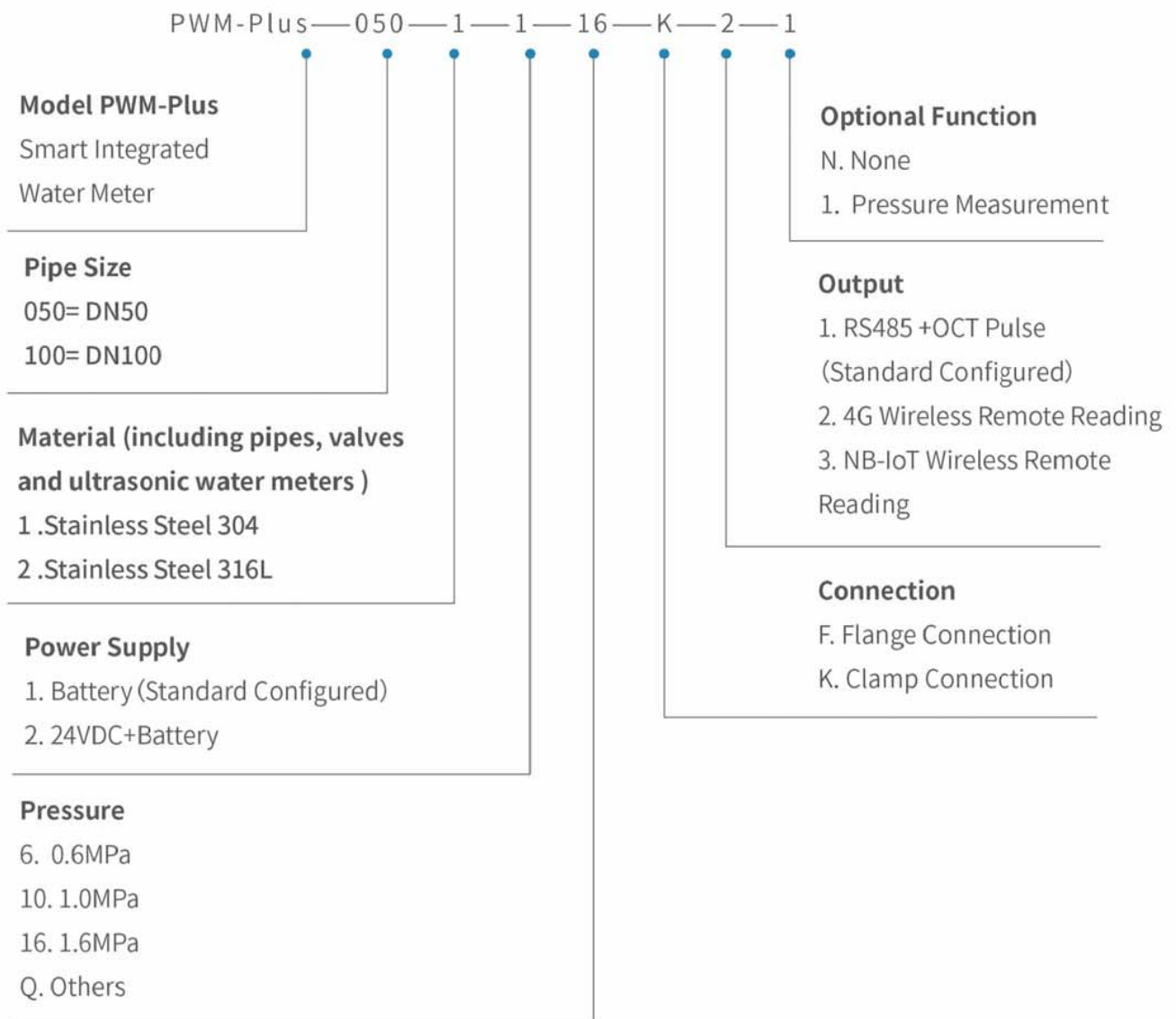# Panda PWM-Plus Series
Smart Integrated Water Meter

· Dimensions & Weight
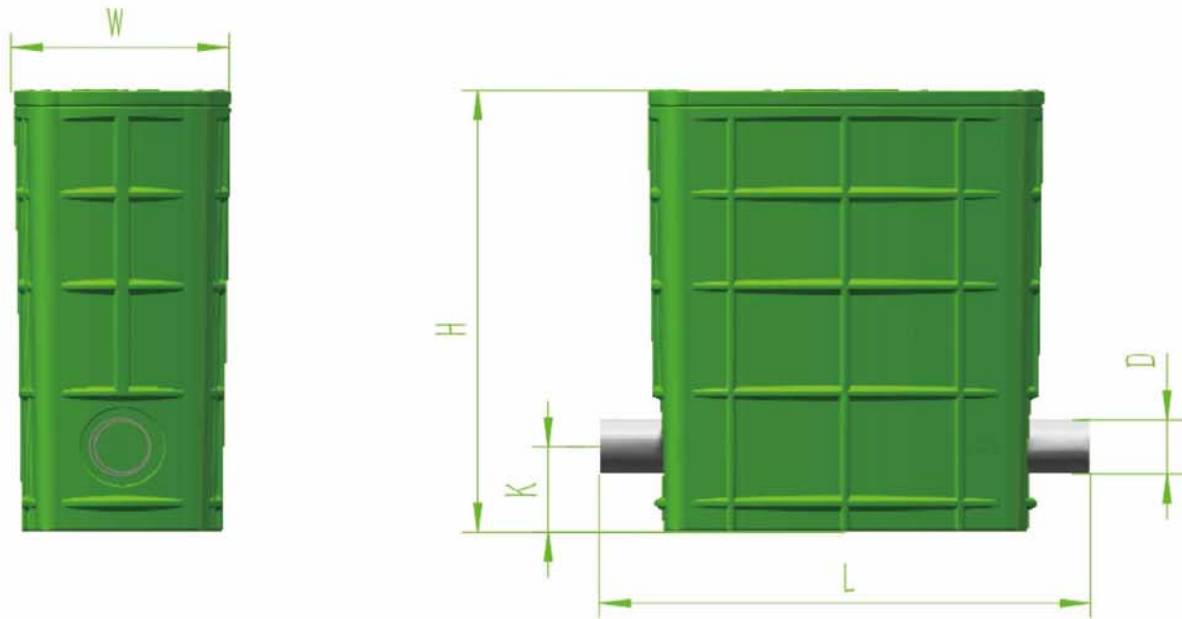
Model		PWM-Plus			
Nominal diameter	(mm)	50	65	80	100
	(inch)	2	2.5	3	4
L-standard length (mm)		644	644	644	644
W-width (mm)		285	285	285	285
H-height (mm)		622	622	622	622
K-pipe height (mm)		120	120	120	120
D-outer diameter of pipe (mm)		57	76	89	108
Pressure (MPa)		1.6	1.6	1.6	1.6

Panda PWM-Plus Series
Smart Integrated Water Meter

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Model Selection >>>

PWM-Plus — 050 — 1 — 1 — 16 — K — 2 — 1

Model PWM-Plus

Smart Integrated
Water Meter

Pipe Size

050= DN50

100= DN100

Material (including pipes, valves and ultrasonic water meters)

1 .Stainless Steel 304

2 .Stainless Steel 316L

Power Supply

1. Battery (Standard Configured)

2. 24VDC+Battery

Pressure

6. 0.6MPa

10. 1.0MPa

16. 1.6MPa

Q. Others

Optional Function

N. None

1. Pressure Measurement

Output

1. RS485 +OCT Pulse
(Standard Configured)

2. 4G Wireless Remote Reading

3. NB-IoT Wireless Remote
Reading

Connection

F. Flange Connection

K. Clamp Connection

For Example: PWM-Plus-050-1-1-16-K-2-1

Stand for: PWM-Plus smart integrated water meter, the diameter is DN50,SS304 material, battery powered, 1.6Mpa pressure, clamp connection, 4G Wireless Remote Reading, with pressure measurement.

Panda PG20
GPRS/NB-IoT Wireless Remote Reading Device

Features ⟫⟫⟫

- LCD Display Function, Real-time Data Updating
- Super Long Stand-by Time, The Battery Working Life Is 6 Years If Upload Twice one Day
- Adopt NB Communication Module, Transmit And Receive Data By Multiple Frequency Bands
- Reading Forward And Reverse Cumulative Flow, Instantaneous Flow, Pressure, Voltage etc.
- 3.6V Power Output Can Power Supply To Low-power Consumption Pressure Transmitter
- Built-in Large Data Logger Can Save 4 Months' Data
- With Power-off Memory Function, No Need To Reset Parameters After Powered off
- Automatically Transmitting And Resending Data Function
- Parameter Inquiry, Parameter Setting And Status Inquiry Can Be Carried Out Via Bluetooth

Technical Specification ⟫⟫⟫

Power Supply	Built-in Lithium Battery (3.6V)
External Power Supply	External 3.6V power supply for meter communication parts, current≤80mA
Consumption Current	Stand-by 30uA, transferring peak 100mA
Working Life	2 years (reading in 15 minutes, transferring in 2 hours interval)
	6 years (reading in 15 minutes, transferring in 12 hours interval)
Communication	Adopt NB communication module, by frequency band B1, B2, B3, B5, B8, B12, B13 and B17 to receive and send message, monthly data usage less than 10M
Data Logger Time	Data can be saved in the device for 4 months
Enclosure Material	Cast Aluminum
Protection Class	IP68
Operation Environment	-40°C~70°C, ≤100%RH
Climate Mechanical Environment	Class O
Electromagnetic Class	E2

Panda PG20-A
GPRS/4G Wireless Remote Reading Device

Features 〉〉〉

- It Has The Function Of Four-channel Analog Data Reading And 16-bit High Precision A/D Simultaneous Sampling.
- It Has The Function Of Two Channels Pulse Counting And Two Channels Switch Sampling.
- It Has One RS485 Interface, Specially Used For RS485 Instrument Communication.
- The Corresponding Parameters Can Be Set Through The USB Interface.
- The Parameter Type, Range, Starting Point, Upper And Lower Alarm Threshold And Pulse Bottom Of The Data Can Be Collected.
- Configurable Station Number, Time, Communication Parameters Etc.
- Support Dynamic Domain Name And Fixed IP, Support Data Transfer UDP Or TCP Mode.
- Configurable Analog And Switching GSM Message Alarm Function.
- All Run Parameters Can Be Queried And Set Locally And Remotely.
- With Power-off Memory Function, No Need To Reset Parameters After Powered Off
- Large Capacity Eeprom, Can Save A Month Of Historical Data While Saving Once Per Minute
- Communication Transceiver And Module Status Indicator Light Can Clearly Indicate The Working Status Of The Collector.

Technical Specification 〉〉〉

Power Supply	DC 9～24V
External Power Supply	24VDC output, 20mA drive capability
Communication	4G communication module, support NB-IoT
Data Logger Time	Data can be saved in the device for 1 month while saving every minute
Analog Input Impedance	250Ω, adopt 4～20mA, 0～5V direct current signal
Protection Class	IP65
Operation Environmen	-40℃~+70℃，≤100%RH
Climatic Mechanical Environment	Class O
Electromagnetic Class	E2

Panda PUTF Series
Transit-time Ultrasonic Flow Meter

Working Principle »»
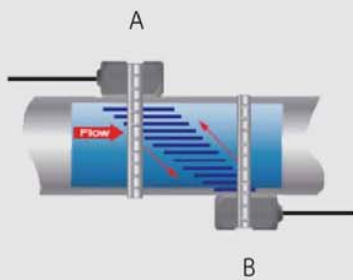
Transit-time ultrasonic flow meter utilizes the difference of ultrasonic sound forwarding and reversing flow rate to measure flow. Two transducers that function as both transmitter and receivers are clamped on outside of a closed pipe at a specific distance from each other. The transducer signal travels faster downstream than upstream. By measuring transit time $\triangle t$, the average flow velocity can be detained. The volume flow Q can be calculated out of the flow velocity V and pipe sectional area S.

$$V = K^* (t_{BA} - t_{AB}) = K^* \triangle t \quad Q = S \times V$$

t_{AB}:travel time of downstream sound waves t_{BA}:travel time of upstreamsound waves

V = Velocity $\triangle t$ = Time difference   K = Constant

Technical Features »»

- 4 Lines Display Velocity, Flow Rate, Volume And Meter Status
- Clamp-on Mounted, Unnecessary Pipe Cutting Or Processing Interruption Acceptable Fluid Temperature
- Range -40℃~260℃
- Built-in Data Storage Is Optional
- Selecting Temperature Sensor PT1000 To Achieve Thermal Energy Measurement Function
- Suitable For DN20-DN6000 Flow Measurement By Selecting Different Size Transducers
- Bi-directional Measurement

Application »»

Suitable for measuring clean liquid in fully filled pipe, also for liquid with tiny amounts of solids, air bubbles. Widely applied to many fields, for examples as below...

| Water supply and drainage | HAVC | Building energy efficiency | Petrochemical Industrial | Mechanical and Mining |

Panda PUTF201 Series
Clamp-on Transit-time Ultrasonic Flow Meter

Summary >>>

PUTF201 series clamp-on transit-time ultrasonic flow meter utilizes transit-time principle. The transducer is mounted outside surface of the pipe without flow stop or pipe cutting. It's very simple, convenient for installation, calibration and maintenance. Different sizes of transducers satisfy different measuring demand. Plus, select thermal energy measuring function to achieve completely energy analysis. It is widely applied in processing monitoring, water balance test, district heating balance test, energy efficiency monitoring as easy installation and simple operation advantages.

Features >>>

- 4 Lines Display Velocity, Flow Rate, Volume And Meter Status
- Clamp-on Mounted, Unnecessary Pipe Cutting Or Processing Interruption
- Acceptable Fluid Temperature Range -40°C~260°C
- Built-in Data Storage Is Optional
- Selecting Temperature Sensor PT1000 To Achieve Thermal Energy Measurement Function
- Suitable For DN20-DN6000 Flow Measurement By Selecting Different Size Transducers
- Bi-directional Measurement, Flow Range From 0.01m/s To 12m/s

Panda PUTF201 Series
Clamp-on Transit-time Ultrasonic Flow Meter

Specification ⋙

· Transmitter

Measuring Principle	Transit-time
Velocity	0.01 - 12 m/s, 0.01m/s - 12 m/s, Bi-directional Measurement
Resolution	0.25mm/s
Repeatability	0.10%
Accuracy	±1.0% R
Response Time	0.5s
Sensitivity	0.003m/s
Damping	0-99s(settable by user)
Suitable Fluid	Clean or tiny amounts of solids, air bubbles liquid , Turbidity <10000 ppm
Power Supply	AC: 85-265V DC:12-36V/500mA
Installation	Wall Mounted
Protection Class	IP66
Operating Temperature	-40°C ~ +75°C
Enclosure Material	Fiberglass
Display	4X8 Chinese Or 4X16 English，Backlit
Measuring Unit	meter, ft, m³, liter, ft³, gallon, barrel etc.
Communication Output	4~20mA, OCT, Relay, RS485 (Modbus-RUT), Data Logger ,GPRS
Energy Unit	Unit: GJ，Opt: KWh
Security	Keypad Lockout, System Lockout
Size	244*196*114mm
Weight	2.4kg

· Transducer

Protection Class	IP67
Fluid Temperature	Std. transducer : -40°C~85°C(Max.120°C) High Temp : -40°C~260°C
Pipe Size	20mm-6000mm
Transducer Size	S (20mm-50mm) M (40mm-1000mm) L (1000mm-6000mm)
Transducer Material	Std.Aluminum alloy, High Temp.(PEEK)
Temperature Sensor	PT1000
Cable Length	Std. 10m (customized)

Panda PUTF201 Series
Clamp-on Transit-time Ultrasonic Flow Meter

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Model Selection ≫

PUTF201 —— A —— 1 —— 1 —— /M —— N —— N —— 1 —— N —— 10m

Model

PUTF201 Clamp-on Transit-time Ultrasonic Flow Meter

Power Supply

A. 85-265VAC+24VDC

B. Solar Power

Output

1. Standard Configuration (4-20mA+OCT+RS485+Relay)

2. Standard Configuration +Hart Protocol

3. Others

Optional

1. Data Storage

N. None

PUTF201 Transducer

S DN20-DN50

M DN40-DN1000

L DN1000-DN6000

Mounting Type

N Common

Y Magnetic

Cable

10m Std. 10m

Xm Common Cable (Max.300m)

XmH High Temp. Cable

Temperature Sensor

N None

1、Clamp on PT1000 (0～+200°C), only for thermal flow meter

2. Insertion PT1000 (0～+200°C), only for thermal flow meter

Stainless Steel Belt

1. 1m (DN20-DN200)

2. 2m (DN250-DN500)

3. 4m(DN600-DN1200)

4. Others

Transducer Temperature

N -40°C～+85°C(Max.120°C)

H -40°C～+260°C

For Example: PUTF201-A-1-1/M-N-N-1-N-10m
Stands for: PUTF201clamp-on ultrasonic flow meter, 220VAC power supply, 4-20mA, OCT, RS485 and relay output, with data storage, M transducer, common mounting type, normal temperature, stainless steel belt 1m, cable length 10m.

Panda PUTF202 Series
Insertion Transit-time Ultrasonic Flow Meter

Summary >>>

PUTF202 insertion transit-time ultrasonic flow meter utilizes transit-time principle. It effectively solves clamp-on flow meter cannot accurately measure while scaling pipe and non-conductive media. Insertion transducer with stop valve is unnecessary to stop flow or cut pipe for installation and maintenance. For unable directly drilling pipe or not smooth surface pipe, we mount hoops while installation. Plus, select thermal energy measuring function to achieve completely energy analysis. It is widely applied in processing monitoring, water balance test, district heating balance test, energy efficiency monitoring as easy installation and simple operation advantages.

Features >>>

- 4 Lines Display Velocity, Flow Rate, Volume And Meter Status
- Installation Without Flow Stop, Unnecessary Pipe Cutting Or Processing Interruption
- Fluid Temperature Range -40°C~160°C
- Built-in Data Storage Is Optional
- Selecting Temperature Sensor PT1000 To Achieve Thermal Energy Measurement Function
- Suitable For DN65-DN6000 Flow Measurement
- Bi-directional Measurement, Flow Range From 0.01m/s To 12m/s

Panda PUTF202 Series
Insertion Transit-time Ultrasonic Flow Meter

Specification >>>

· Transmitter

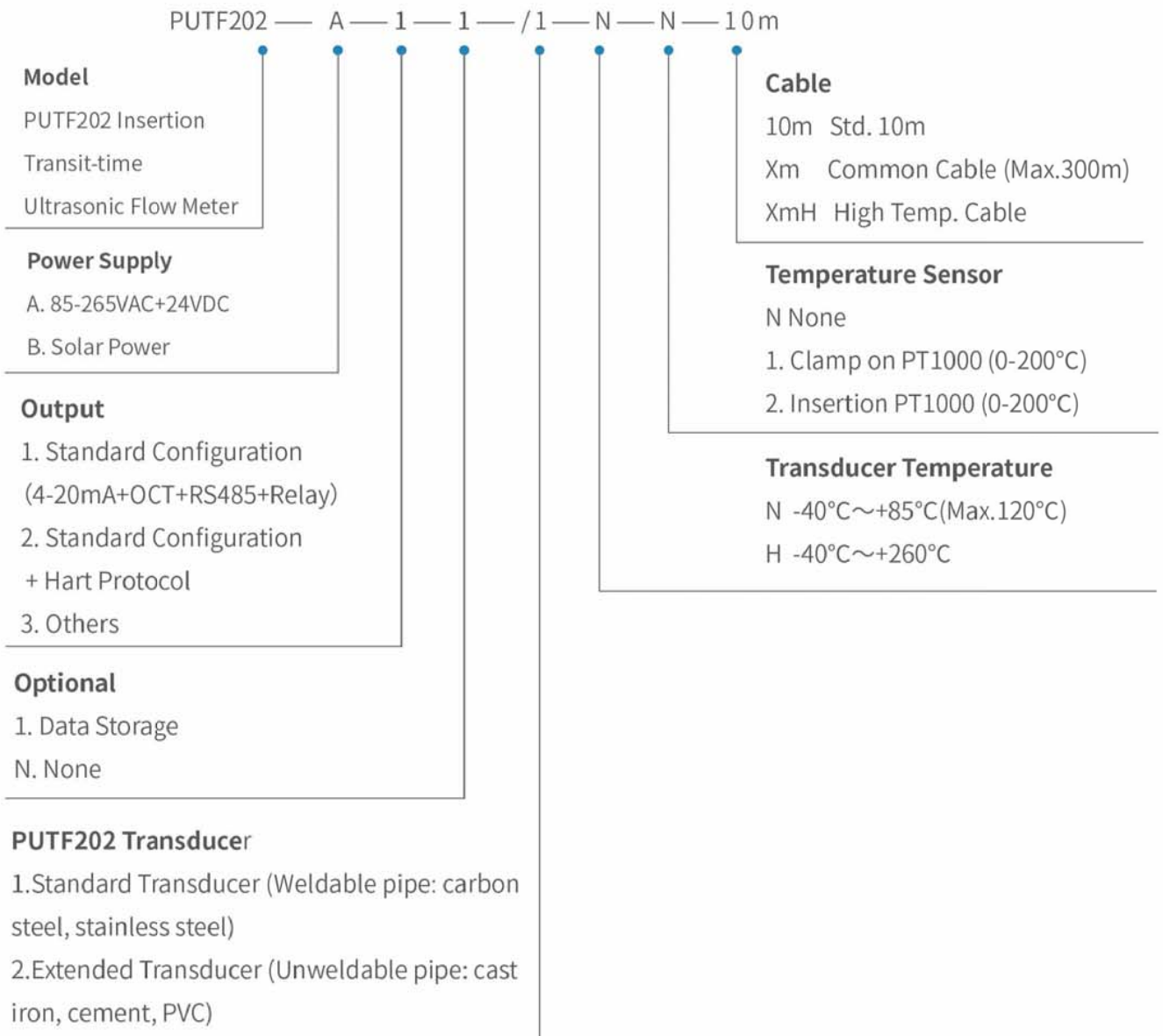| Measuring Principle	Transit-time
Velocity	0.01m/s - 12 m/s, Bi-directional Measurement
Resolution	0.25mm/s
Repeatability	0.10%
Accuracy	±1.0% R
Response Time	0.5s
Sensitivity	0.003m/s
Damping	0-99s (settable by user)
Suitable Fluid	Clean or tiny amounts of solids, air bubbles liquid , Turbidity <10000 ppm
Power Supply	AC: 85-265V DC:12- 36V/500mA
Installation	Wall Mounted
Protection Class	IP66
Operating Temperature	-40℃ ~ +75℃
Enclosure Material	Fiberglass
Display	4X8 Chinese Or 4X16 English，Backlit
Measuring Unit	meter，ft，m³，liter，ft³，gallon，barrel etc.
Communication Output	4~20mA, OCT, Relay, RS485 (Modbus-RUT), Data Logger ,GPRS
Energy Unit	Unit: GJ，Opt: KWh
Security	Keypad Lockout, System Lockout
Size	244*196*114mm
Weight	2.4kg

· Transducer

Protection Class	IP68
Fluid Temperature	Std. transducer : -40℃~85℃ (Max.120℃) High Temp : -40℃~160℃
Pipe Size	65mm-6000mm
Transducer Size	Std. transducer Extended transducer
Transducer Material	Stainless Steel
Temperature Sensor	PT1000
Cable Length	Std. 10m (customized)

Panda PUTF202 Series
Insertion Transit-time Ultrasonic Flow Meter

Model Selection >>>

PUTF202 —— A — 1 — 1 — /1 — N — N — 10m

Model

PUTF202 Insertion

Transit-time

Ultrasonic Flow Meter

Power Supply

A. 85-265VAC+24VDC

B. Solar Power

Output

1. Standard Configuration

(4-20mA+OCT+RS485+Relay)

2. Standard Configuration

+ Hart Protocol

3. Others

Optional

1. Data Storage

N. None

PUTF202 Transducer

1.Standard Transducer (Weldable pipe: carbon

steel, stainless steel)

2.Extended Transducer (Unweldable pipe: cast

iron, cement, PVC)

Cable

10m Std. 10m

Xm   Common Cable (Max.300m)

XmH High Temp. Cable

Temperature Sensor

N None

1. Clamp on PT1000 (0-200°C)

2. Insertion PT1000 (0-200°C)

Transducer Temperature

N -40°C～+85°C(Max.120°C)

H -40°C～+260°C

For Example: PUTF202-A-1-1/1-N-N-10m
Stands for: PUTF202 insertion ultrasonic flow meter, 220VAC+24VDC power supply, 4-20mA, OCT, RS485
and relay output, with data storage, standard Transduce for weldable pipe, normal temperature, cable length 10m

Panda PUTF206 Series

Battery Powered Transit-time Multi-channel Insertion Ultrasonic Flow Meter

Summary ⫸

Battery powered transit-time multi-channel insertion ultrasonic flow meter utilizes transit-time principle. No need external power supply and suitable for various occasions without power supply. It effectively solves problems that clamp-on flow meter can't accurately measure while scaling pipe and non-conductive media. Insertion transducer with stop valve is unnecessary to stop flow or cut pipe for installation and maintenance. For unable directly drilling pipe, need to mount hoops while installation. It is widely applied in water supply and drainage, production monitoring, energy-saving monitoring etc.as easy installation and simple operation advantages.

Features ⫸

- Installation Without Flow Stop, Unnecessary Pipe Cutting Or Processing Interruption.
- LCD Display Velocity, Flow Rate And Volume
- Low Starting Flow, High Accuracy, Bi-directional Measurement
- Adopting Ultrasound Measuring, No Moving Parts Ensure Stable And Reliable Long-term Working
- Battery Powered, Low Consumption Design, Battery Can Continuously Work For 6 Years
- No Need External Power Supply, Suitable For Various Occasions Without Power Supply
- Fluid Temperature Range -40°C~160°C
- Configured With Wireless Remote Reading Device
- Suitable For DN65-DN6000 Flow Measurement
- With Self-diagnosis Function, Prompt Error Messages When Abnormal Conditions Occur To Ensure
- Safe Operation

Panda PUTF206 Series
Battery Powered Transit-time Multi-channel Insertion Ultrasonic Flow Meter
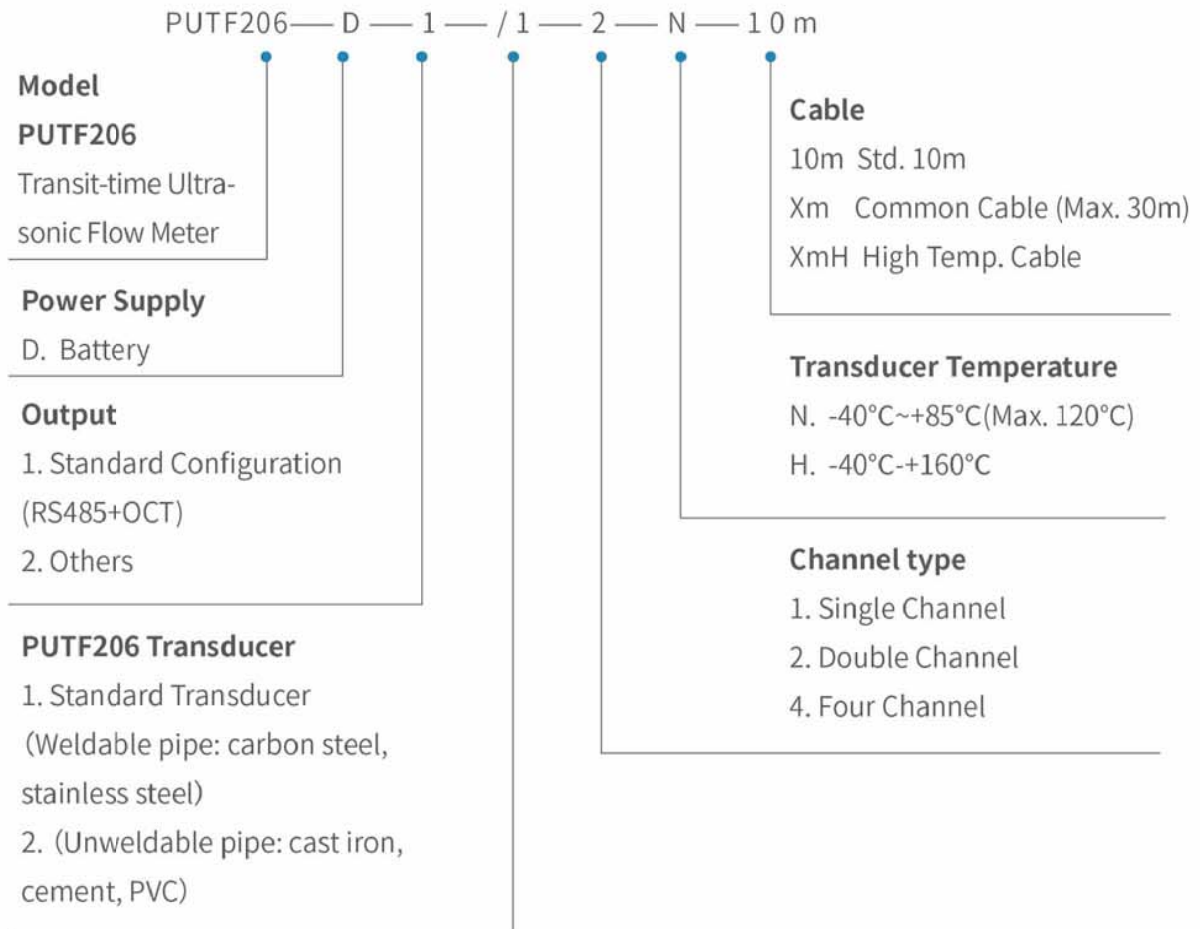
Technical Specification »»

· Transmitter

Measuring Principle	Transit-time
Velocity	0.1m/s - 12m/s, Bi-directional Measurement
Resolution	0.25mm/s
Repeatability	0.10%
Accuracy	±1.0% R、±0.5% R (flow rate>0.3 m/s);±0.003 m/s (flow rate<0.3 m/s)
Response Time	0.5s
Suitable Fluid	Clean or tiny amounts of solids, air bubbles liquid, Turbidity <10000 ppm
Power Supply	3.6V Battery
Protection Class	IP65
Environmental Temperature	-40℃ ~ +75℃
Enclosure Material	Die-cast aluminum
Display	9 digits multi-line LCD display. Can display cumulative flow, instantaneous flow, flow rate, error alarm, flow direction etc. at the same time.
Measuring Unit	meter，m³，liter
Communication Output	RS485(baud rate adjustable), Pulse, NB-IoT, GPRS etc.
Data Storage	Store the latest 10 years' data including day, month and year. Data can be permanently saved even powered off.
Size	199*109*72mm
Weight	1kg

· Transducer

Protection Class	IP68
Fluid Temperature	Std. transducer: -40℃~+85℃ (Max. 120℃) High temp: -40℃~+160℃
Pipe Size	65mm-6000mm
Transducer Type	Std. transducer Extended transducer
Transducer Material	Stainless Steel
Channel Type	Single-channel, dual-channel, four-channel
Cable Length	Std. 10m(customized)

Panda PUTF206 Series

Battery Powered Transit-time Multi-channel Insertion Ultrasonic Flow Meter

PANDA 熊猫

Model Selection ≫

PUTF206 — D — 1 — / 1 — 2 — N — 1 0 m

Model

PUTF206

Transit-time Ultrasonic Flow Meter

Power Supply

D. Battery

Output

1. Standard Configuration (RS485+OCT)

2. Others

PUTF206 Transducer

1. Standard Transducer (Weldable pipe: carbon steel, stainless steel)

2. (Unweldable pipe: cast iron, cement, PVC)

Cable

10m Std. 10m

Xm   Common Cable (Max. 30m)

XmH High Temp. Cable

Transducer Temperature

N. -40°C~+85°C(Max. 120°C)

H. -40°C-+160°C

Channel type

1. Single Channel

2. Double Channel

4. Four Channel

For example: PUTF206-D-1-1-2-N-10m

Stands for: PUTF206 insertion ultrasonic flow meter, battery powered, OCT pulse and RS485 output, standard transducer for weldable pipe, double channels, normal temperature, cable length 10m.

Panda PUTF203 Series
Handheld Transit-time Ultrasonic Flow Meter

Summary ⟫

PUTF203 handheld transit-time ultrasonic flow meter utilizes transit-time principle. The transducer is mounted outside surface of the pipe without flow stop or pipe cutting. It's very simple, convenient for installation, calibration and maintenance. Different sizes of transducers satisfy different measuring demand. Plus, select thermal energy measuring function to achieve completely energy analysis. As small size, easy to carry, simple installation, widely applied in mobile measuring, calibration, data comparison fields etc.

Features ⟫

- Small Size, Easy To Carry And Simple Installation
- Built-in Chargeable Lithium Battery Can Continuously Work 14 Hours
- 4 Lines Display Velocity, Flow Rate, Volume And Meter Status
- Clamp-on Mounted, Unnecessary Pipe Cutting Or Processing Interruption
- Fluid Temperature Range -40°C~260°C
- Built-in Data Storage Is Optional
- Suitable For DN20-DN6000 Flow Measurement By Selecting Different Size Transducers
- Bi-directional Measurement, Flow Range From 0.01m/s To 12m/s

Panda PUTF203 Series
Handheld Transit-time Ultrasonic Flow Meter

PANDA 熊猫

Specification >>>

· Transmitter

Measuring Principle	Transit-time
Velocity	0.01m/s - 12 m/s，Bi-directional Measurement
Resolution	0.25mm/s
Repeatability	0.10%
Accuracy	±1.0% R
Response Time	0.5s
Sensitivity	0.003m/s
Damping	0-99s (settable by user)
Suitable Fluid	Clean or tiny amounts of solids, air bubbles liquid , Turbidity <10000 ppm
Power Supply	AC: 85-265V, built-in chargeable lithium battery can continuously work 14 hours
Protection Class	IP65
Operating Temperature	-40°C ~ +75°C
Enclosure Material	ABS
Display	4X8 Chinese Or 4X16 English，Backlit
Measuring Unit	meter，ft，m³，liter，ft³，gallon，barrel etc.
Communication Output	Data Logger
Security	Keypad Lockout, System Lockout
Size	212*100*36mm
Weight	0.5kg

· Transducer

Protection Class	IP67
Fluid Temperature	Std. transducer: -40°C~85°C(Max.120°C) High Temp: -40°C~260°C
Pipe Size	20mm-6000mm
Transducer Size	S (20mm-50mm) M (40mm-1000mm) L (1000mm-6000mm)
Transducer Material	Std. Aluminum alloy, High Temp.(PEEK)
Cable Length	Std. 5m (customized)

Panda PUTF203 Series
Handheld Transit-time Ultrasonic Flow Meter

Model Selection ≫

PUTF203 —— A —— 1 —— /M —— N —— 2 ——5m

Model

PUTF203 Handheld
Transit-time Ultrasonic
Flow Meter

Power Supply

A. 85-265V AC+24VDC (built-in
chargeable battery)

Optional

1. Data Storage
N.None

PUTF203 Transducer

S.DN20-DN50
M. DN40-DN1000 (Standard)
L. DN1000-DN6000

Cable

5m   Std. 5m
Xm   Common Cable (max.300m)
XmH High Temp. Cable

Stainless Steel Belt

1. 1m (DN20-DN200)
2. 2m (DN250-DN500)
4. 4m (DN600-DN1200)
5. Others

Transducer Temperature

N -40°C～+85°C (Max.+120°C)
H -40°C～+260°C

For Example: PUTF203- A-1/M-N-2-5m
Stands for: PUTF203 handheld transit-time ultrasonic flow meter, 85-265VAC power supply, data storage, M transducer, normal temperature, cable length 5m

Panda PUTF205 Series
Portable Transit-time Ultrasonic Flow Meter

Summary 》》》

PUTF205 portable transit-time ultrasonic flow meter utilizes transit-time principle. The transducer is mounted outside surface of the pipe without flow stop or pipe cutting. It's very simple, convenient for installation, calibration and maintenance. Different sizes of transducers satisfy different measuring demand. Plus, select thermal energy measuring function to achieve completely energy analysis. It is widely applied in processing monitoring, water balance test, district heating balance test, energy efficiency monitoring as easy installation and simple operation advantages.

Features 》》》

- Built-in Chargeable Lithium Battery Can Continuously Work 50 Hours
- 4 Lines Display Velocity, Flow Rate, Volume And Meter Status
- Clamp-on Mounted, Unnecessary Pipe Cutting Or Processing Interruption
- Fluid Temperature Range -40°C~260°C
- Built-in Data Storage Is Optional
- Selecting Temperature Sensor PT1000 To Achieve Thermal Energy Measurement Function
- Suitable For DN20-DN6000 Flow Measurement By Selecting Different Size Transducers
- Bi-directional Measurement, Flow Range From 0.01m/s To 12m/s

Panda PUTF205 Series
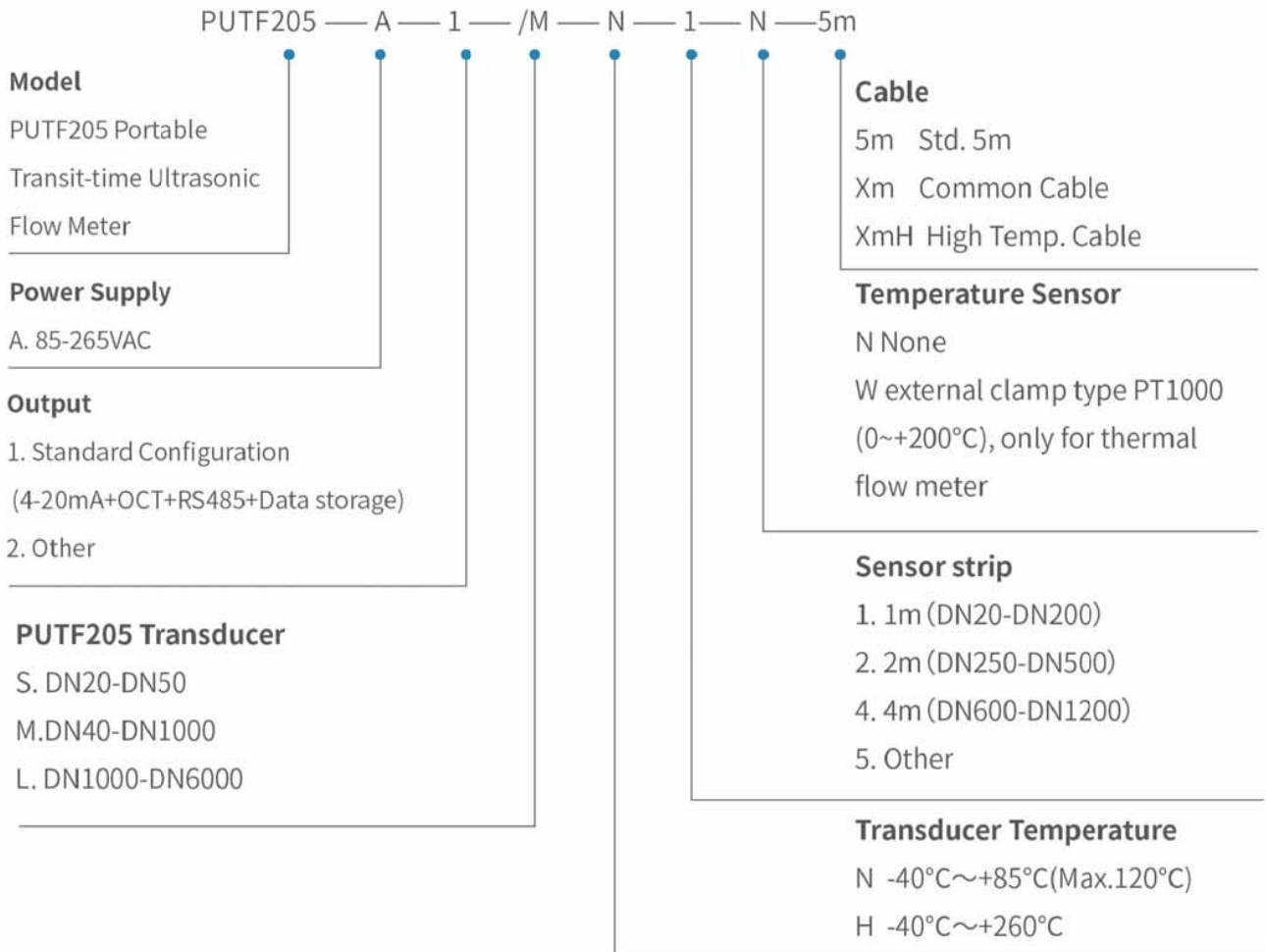# Portable Transit-time Ultrasonic Flow Meter

Specification ⟫⟫

· Transmitter

Measuring Principle	Transit-time
Velocity	0.01m/s - 12 m/s,Bi-directional Measurement
Resolution	0.25mm/s
Repeatability	0.10%
Accuracy	±1.0%R、±0.5%R (velocity>0.3m/s) ; ±0.003m/s (velocity<0.3m/s)
Response Time	0.5s
Sensitivity	0.003m/s
Damping	0-99s (settable by user)
Suitable Fluid	Clean or tiny amounts of solids, air bubbles liquid , Turbidity <10000 ppm
Power Supply	AC: 85-265V AC(Built-in rechargeable battery)
Installation	Portable
Protection Class	IP66
Operating Temperature	-40°C ~ +75°C
Enclosure Material	ABS
Display	4X8 Chinese Or 4X16 English，Backlit
Measuring Unit	meter，ft，m³，liter，ft³，gallon，barrel etc.
Communication Output	4~20mA, OCT, RS485 (Modbus-RUT), Data Logger
Energy Unit	Unit: GJ，Opt: KWh
Security	Keypad Lockout, System Lockout
Size	270*246*175mm
Weight	3kg

· Transducer

Protection Class	IP67
Fluid Temperature	Std. transducer : -40°C~85°C(Max.120°C) High Temp : -40°C~260°C
Pipe Size	20mm-6000mm
Transducer Size	S (20mm-50mm) M (40mm-1000mm) L (1000mm-6000mm)
Transducer Material	Std. Aluminum alloy, High Temp.(PEEK)
Cable Length	Std. 5 m (customized)

Panda PUTF205 Series
Portable Transit-time Ultrasonic Flow Meter

PANDA 熊猫

Model Selection >>>

PUTF205 —— A —— 1 —— /M —— N —— 1 —— N —— 5m

Model

PUTF205 Portable
Transit-time Ultrasonic
Flow Meter

Power Supply

A. 85-265VAC

Output

1. Standard Configuration
(4-20mA+OCT+RS485+Data storage)

2. Other

PUTF205 Transducer

S. DN20-DN50

M.DN40-DN1000

L. DN1000-DN6000

Cable

5m   Std. 5m

Xm   Common Cable

XmH High Temp. Cable

Temperature Sensor

N None

W external clamp type PT1000
(0~+200°C), only for thermal
flow meter

Sensor strip

1. 1m (DN20-DN200)

2. 2m (DN250-DN500)

4. 4m (DN600-DN1200)

5. Other

Transducer Temperature

N -40°C~+85°C(Max.120°C)

H -40°C~+260°C

For Example: PUTF205-A-1/M-N-1-N-5m

Stands for:PUTF205 portable transit-time ultrasonic flow meter, 85-265VAC power supply,

4-20mA+OCT+RS485+Data storage output, M transducer, common transducer, stainless steel belt 1m, cable
length 5m.

Panda PUDF Series
Doppler Ultrasonic Flow Meter

Working Principle »»
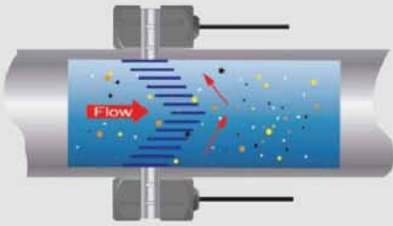
Doppler ultrasonic flow meter operates by transmitting an ultrasonic sound from its transmitting transducer, the sound will be reflected by useful sonic reflectors suspended within the liquid and recorded by the receiving transducer.Take clamp-on doppler ultrasonic flow meter as an example,the sound wave from a transmitting transducer goes through the pipe wall and into the moving liquid.The sound wave is reflected by suspended particles or bubbles moving with the liquid and ultimately gathered by receiving transducer.A frequency shift(doppler effect) will occur that is directly proportional to the speed of the moving particles and bubbles.This shift in frequency is interpreted by the digital signal processor(DSP) and converted to a fluid velocity measurement.If the liquid is not moving,transmitting and receiving signal is equal,there is no frequency shift.

Formula:

$$q_v = \frac{AC_1}{2K\cos\alpha}\frac{\Delta f}{f_1}$$

qv=Volume flow, c1=sound velocity,α=signal angle, K=calibration factor, Δƒ=Doppler Shift, A=Profile Area, ƒ1=frequency

Features »»

- Excellent low flow rate measurement ability, low to 0.05m/s
- A wide range of flow measurement, high flow rate can reach 12m/s
- Signal Automatic Gain Adjustment
- Regardless of clamp-on or insertion type, unnecessary to cut pipe or stop flow
- Simple Operation, only input inner diameter to realize flow measurement
- Pulse Output Flow Rate, Total flow and Alarm
- Suitable for measuring raw sewage in large size pipeline

Application »»

Widely applied in municipal sewage settlement,drainage pumping station,environmental Monitoring and measuring drainage,industrial effluent,residential waste water, slurry ,paper slurries,oil-water mixture etc in coal,metallurgy,mining,refinery,chemical, paper mill,food fields.

Panda PUDF301 Series
Doppler Clamp-on Ultrasonic Flow Meter

Summary >>>

PUDF301 doppler clamp-on ultrasonic flow meter is designed for measuring liquid with suspended solids,air bubbles or sludge in a sealed closed pipeline. Non-invasive transducers are mounted outside surface of the pipe. It has advantage that measurement is not influenced by pipe scale or blockage. Simple installation and easy calibration as unnecessary pipe cutting or flow stop.

Features >>>

- Non-invasive Installation,Unnecessary pipe cutting or flow interruption
- Measuring Accuracy± 0.5% ～±2%F.S
- Signal Automatic Gain Adjustment
- Anti-interference Frequency Converter
- Simple Operation,Only Input Inner Diameter To Realize Flow Measurement
- 2*8 LCD Display Flow Rate,Volume,Velocity etc

Panda PUDF301 Series
Doppler Clamp-on Ultrasonic Flow Meter

Specification >>>

· Transmitter

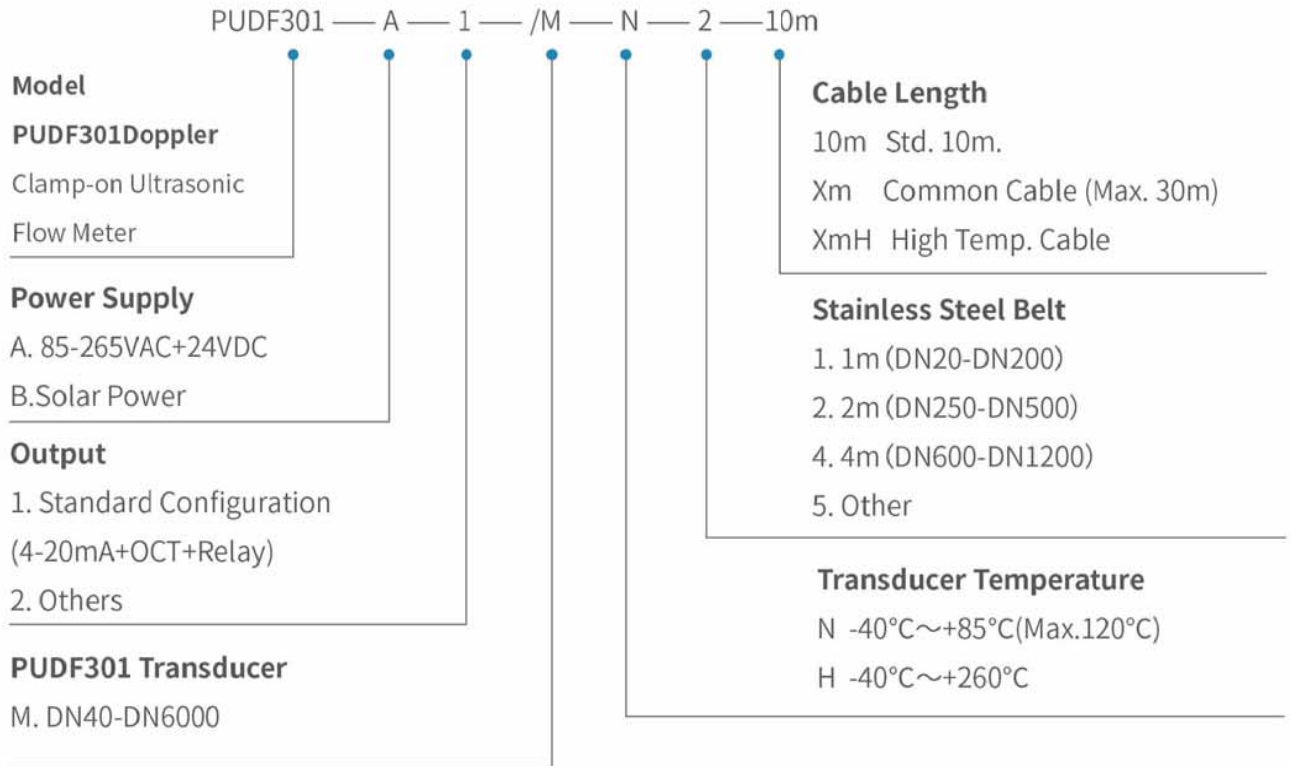| Measuring Principle	Doppler Ultrasonic
Velocity	0.05m/s - 12 m/s,Bi-directional measurement
Repeatability	0.4%
Accuracy	±0.5% ~ ±2.0% F.S.
Response Time	2-60 sec (Select by user)
Measuring Cycle	500 ms
Suitable Fluid	Liquid containing more than 100ppm of reflector (Suspended solids or air bubbles), reflector >100 micron
Power Supply	AC: 85-265V DC: 24V/500mA
Installation	Wall mounted
Protection Class	IP66
Operation Temperature	-40°C ~ +75°C
Enclosure Material	Fiberglass
Display	2*8 LCD, 8 digits flow rate,volume (resettable)
Measuring Unit	volume/mass/velocity:liter,m³,kg, meter,gallon etc;flow time unit:sec,min, hour, day; Volume Rate:E-2~E+6
Communication Output	4~20mA, Relay, OCT
Keypad	4 buttons
Size	244*196*114mm
Weight	2.4kg

· Transducer

Protection Class	IP67
Fluid Temperature	Std.transducer: -40°C~85°C(Max.120°C) High Temp: -40°C~260°C
Pipe size	40mm-6000mm
Transducer Type	General standard
Transducer Material	Std. Aluminum alloy, High Temp.(PEEK)
Cable Length	Std. 10m (customized)

Doppler Clamp-on Ultrasonic Flow Meter

Model Selection ⟫

PUDF301 —— A —— 1 —— /M —— N —— 2 —— 10m

Model

PUDF301Doppler

Clamp-on Ultrasonic

Flow Meter

Power Supply

A. 85-265VAC+24VDC

B. Solar Power

Output

1. Standard Configuration

(4-20mA+OCT+Relay)

2. Others

PUDF301 Transducer

M. DN40-DN6000

Cable Length

10m   Std. 10m.

Xm   Common Cable (Max. 30m)

XmH   High Temp. Cable

Stainless Steel Belt

1. 1m (DN20-DN200)

2. 2m (DN250-DN500)

4. 4m (DN600-DN1200)

5. Other

Transducer Temperature

N -40℃～+85℃(Max.120℃)

H -40℃～+260℃

For Example: PUDF301-A-1-1/M-N-2-10m

Stands for: PUDF301 Doppler Clamp-on Ultrasonic Flow Meter, 220VAC power supply, 4-20mA, OCT and relay output, standard Transducer, normal temperature, stainless steel belt 2m, cable length 10m.

Panda POF Series
Partially Filled Pipe & Open Channel Flow Meter

Working Principle >>>

· Velocity Measurement

Utilizes doppler ultrasonic principle: any moving liquid in pipeline has discontinuous turbulence. Turbulence may be caused by particles, air bubbles or turbulent surface. The turbulence makes the reflected acoustic wave occur doppler frequency shift Δf .The doppler frequency shift Δf is a function of velocity. So it is not suitable for pure water without any air. Also if too many particles or air bubbles ,the acoustic wave and pipe sectional area will be influenced.
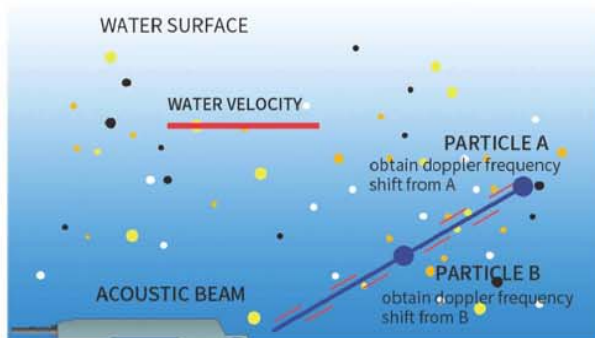
· velocity working principle figure

· depth working principle figure

· Depth Measurement

Pressure sensor is mounted at the bottom of or near water area to measure the fluid pressure, referring to the power signal cable hole atmosphere pressure and then liquid depth can be calculated by the pressure. At the same time pressure sensor is designed in special shapes, in order to reduce the influence of velocity .but it's worthy to pay attention when velocity > 2m/sec

· Flow Calculator

fluid flow formula : $Q = V \cdot S$

V——liquid velocity, S——liquid sectional area

S function of liquid height and pipe inner diameter or open channel width,

$S = f(D \cdot h)$

D——width(pipe inner or channel)

h——height

Panda POF Series
Partially Filled Pipe & Open Channel Flow Meter

Summary »»

POF series flow meter is designed to measure velocity and flow for partially filled pipe and open channel stream or river. It utilizes Doppler ultrasonic theory to measure fluid velocity. According to pressure sensor, the flow depth and sectional area can be obtained, finally the flow can be calculated. POF transducer has the functions of conductivity test, temperature compensation, and coordinate correction. It is widely applied in measuring sewage, waste water, industrial effluents, stream, open channel, residential water, river etc. Also it is applied in monitoring sponge city, urban black odor water and river & tide research.

Features »»

- The Meter Can Programme And Measure Any Shapes Of Open Channel & Partial Filled Pipe
- By 20 Coordinate Points
- Velocity Range 0.02-12m/s, Accuracy ±1.0%
- Bi-directional Measuring Velocity, Positive Flow And Negative Flow
- Depth Measurement By Pressure Sensor And Ultrasonic Sensor, Accuracy ±0.1%
- Built-in Coordinate Correction Function
- Standard 4-20mA, RS485/MODBUS Output, Opt.GPRS
- Available Configure Data Logger With SD Card

Panda POF Series
Partially Filled Pipe & Open Channel Flow Meter

Measuring following datas:
Velocity, Flow, Depth (Ultrasonic), Depth (Pressure), Temperature, Electrical Conductivity (EC)
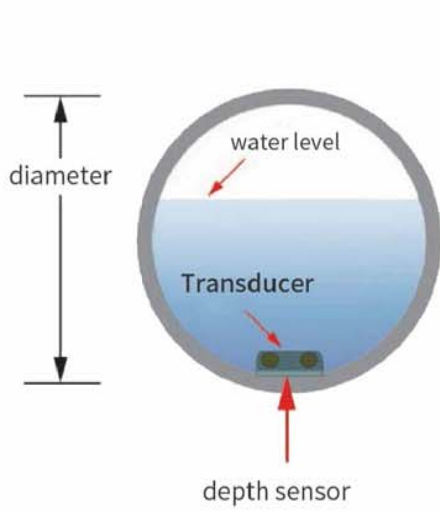
· Sensor Specification

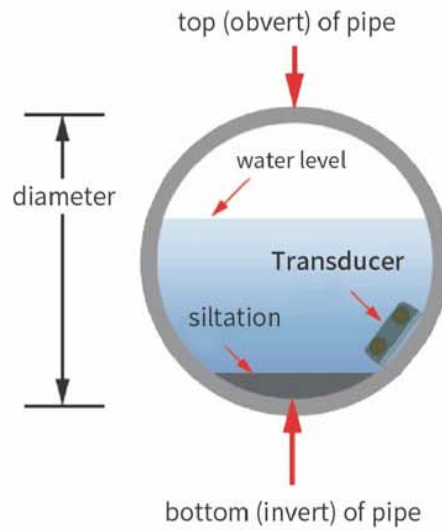|		
Velocity	Range	20mm/s-12m/s Bi-directional Measuring, t Default 20mm/s to 1.6m/s signal-directional measurement
	Accuracy	±1.0% typical
	Resolution	1mm/s
Depth(ultrasonic)	Range	20mm to 5000mm (5m)
	Accuracy	±1.0%
	Resolution	1mm
Pressure level	Range	0mm to 10000mm (10m)
	Accuracy	±1.0%
	Resolution	1mm
Temperature	Range	0 ~ 60℃
	Accuracy	±0.5℃
	Resolution	0.1℃
Conductivity	Range	0 to 200,000 us/cm
	Accuracy	± 1.0% typical
	Resolution	±1us/cm
Tilt	Range	±70° Vertical and horizontal axis
	Accuracy	±1°angles less than 45°
Communication	SDI-12	SDI-12 v1.3 Max.cable 50m
	Modbus	Modbus RTU Max.cable 500m
Display	Display	Velocity, flow, depth
	Application	Pipe, open channel, natural stream
Environment	Operation Temp	0℃ ~60℃ (water temperature)
	Storage Temp	-40℃ ~75℃
	Protection Class	IP68
Others	Cable	Standard 15m, Max.500m
	Material	Epoxide resin sealed enclosure, stainless steel mounting fixture
	Size	135mm x 50mm x 20mm (LxWxH)
	Weight	1kg (with 15m cables)

· Calculator Specification

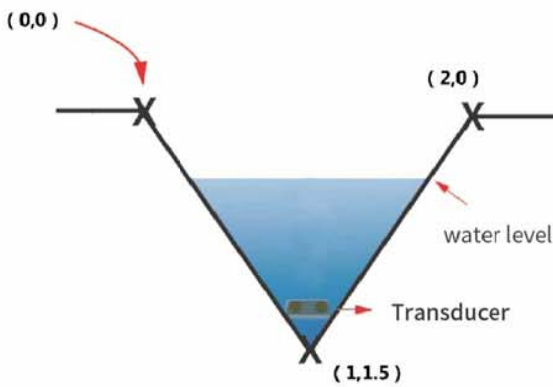|	
Installation	Wall mounted, Portable
Power Supply	AC: 85-265V DC: 12-28V
Protection Class	IP66
Operation Temp	-40℃ ~75℃
Display	4.5 inch LCD
Output	Pulse, 4-20mA (flow, level) , RS485(Modbus) Opt. Data logger, GPRS
Weight	2.4kg
Data Logger	8GB
Application	Partial filled pipe: 150mm-6000mm Open channel: channel width >200mm

Panda POF Series
Partially Filled Pipe & Open Channel Flow Meter

diameter

water level

Transducer

depth sensor

Partial Filled Pipe

top (obvert) of pipe

water level

Transducer

siltation

diameter

bottom (invert) of pipe

Pipe with siltation on button

(0,0)

(2,0)

water level

Transducer

(1,1.5)

V-Notch Shape Channel

(0,0)   Water Level   (3,0)

(1,1)   (2,1)

(0,1)   (3,1)

(1,1.3)   (2,1.3)

Polygonal Channel

(0,1)   Water Level   (3,1)

(0,0)   (3,0)

Rectangular Channel

(0,0)   Water Level   (3.5,0)

(1,1)

(0.5,1)

(1.2,1.3)

(2.2,1.8)   (2.5,1.8)
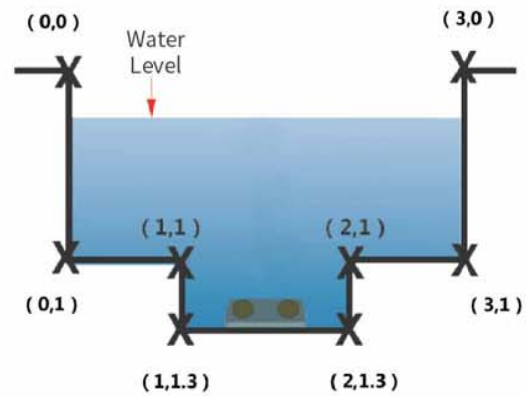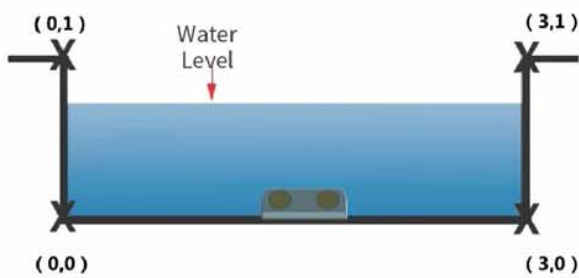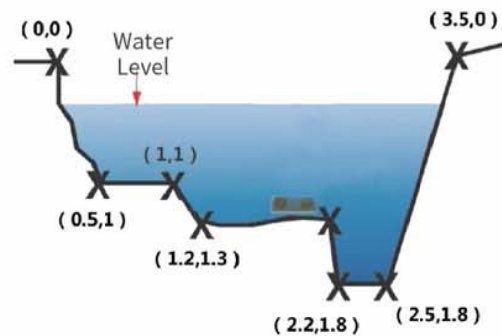
Irregular Shaped Channel

Panda POF Series
Partially Filled Pipe & Open Channel Flow Meter

Model Selection >>>

POF —— 501 —— A —— C —— 2H —— 15

Model

POF Doppler Partially
Filled Pipe & Open
Channel Flow Meter

Mounting Type

501 Wall Mounted

505 Portable

Power Supply

A. 85-265VAC

D. 24VDC (Only for POF fixed series)

Output

N. None

C. 4-20mA

F. RS485

D. Data Logger

Cable Length

15m Std. 15m

Xm Others

Level Range

2H. 0 to 2m

5H. 0 to 5m
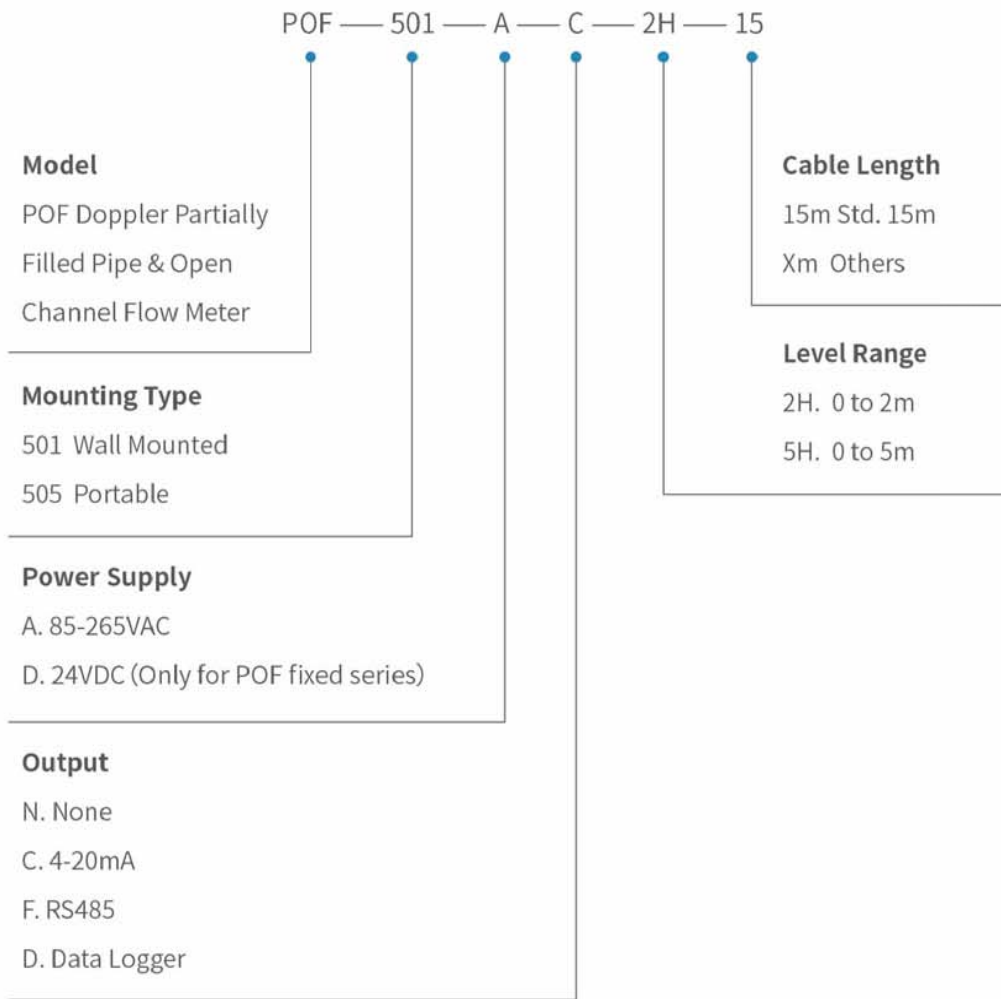
For Example：POF-501-A-C-2H-15
Stands for：Wall mounted doppler partially filled pipe & open channel flow meter, 85-265VAC power
supply, 4-20mA, 2m level range, cable length is 15m.