



# Product Catalogue

**Bove**<sup>®</sup>

Creating an Eco Society



## Mission

To exceed our customers' expectation by providing prompt, quality and reliable technology.

## Vision

Creating an Eco-Society.

## Culture



**ABOUT COMPANY** Bove provides Smart Metering Solutions with latest communication technology, IoT terminals, and softwares to our clients across over 70 countries. Since 2009 Bove has established a complete, multi-level R&D system that includes every operation from research to design, development, testing, configuration, and service. With years' dedication in local-oriented service, Bove brand gets highly reputed across our clients. Thanks to annual investment of over 10% of revenue, Bove is always moving on the edge of technology to deliver state of the art metering products to clients around 5 continents.

Bove is the first Chinese metering manufacturer who release 4 major IoT solutions: NB-IoT, LoRa, Sigfox, and wireless MBus, which enable us to fulfill customer needs in various scenarios like "Measuring Every Drop of Water", "None Revenue Water Management", "Central & Distributional Heating Measurement", "Automatic Calibration of Meters", "Walk/Drive By solutions", "Leakage Detection Solutions", etc.





**70+** countries  
**230+** partners  
**500+** clients  
**1,282,000+** smart meters running online  
**120+** utilities using Bove AMI software  
**0.26%** less faulty meter reported  
**MID** certified  
**More Than Smart**



See for future, Bove is committed to address the unique challenges that our society are facing, including increasing water-consuming, water scarcity, and environment conservation. With hope, honor and quality work, we are pursuing to make Bove one of the best brands in metering industry in the world and bringing a more Eco-Society to our humans.



# GLOBAL FOOTPRINT

## 05

### Metering

#### Ultrasonic Water Metering

BECO X Ultrasonic Water Meter

BECO Y Ultrasonic Water Meter

B97 VPW Valve Control / Prepaid Ultrasonic Water Meter

B39 VW-M Bulk Ultrasonic Water Meter

B9 VW Ultrasonic Water Meter

#### Ultrasonic Heat Metering

B12 VI-B Ultrasonic Heat Meter

## 17

### Software

Alpaca-E AMI Remote Reading and Controlling System

Alpaca-V Prepaid and Vending System

## 21

### Communication Device

LoRaWAN-ID Gateway

LoRaWAN-OD Gateway

LoraWAN Bridge Relay

Jurgen Hand-Held Unit

## 29

### Metrology Equipment

B28 VTB Calibration and Testing Bench



# **BECO X**

**Ultrasonic Water Meter**



BECO X is designed for cold and hot water measuring. It can be installed in residential applications with brass pipe.

### Features



Flexible Battery Lifespan



Proof of Humidity, Water and UV



Battery Replaceable



Exceptional Industry Design

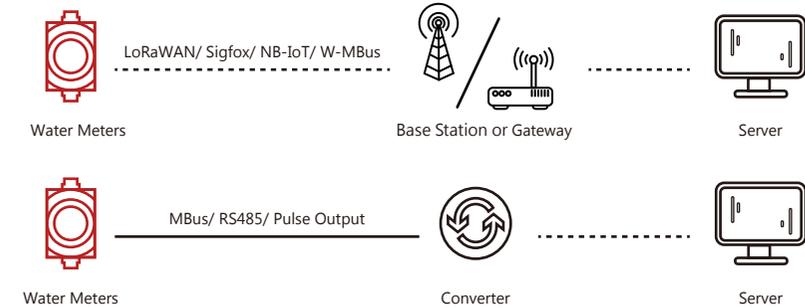


IoT Ready

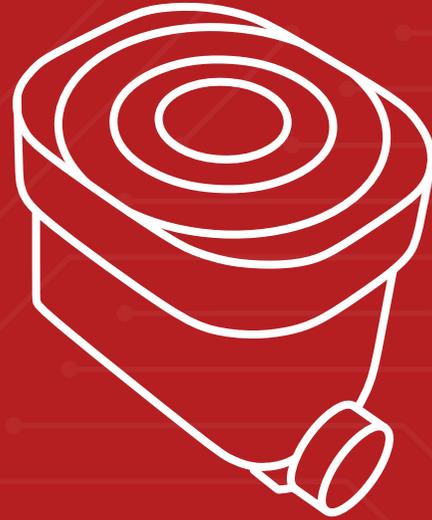


Multiple Dynamic Range Options (Q3/ Q1)

### How does it work?



Pipe Diameter	DN15	DN20	DN25	DN32	DN40
Minimum Flow Rate Q <sub>1</sub> (m <sup>3</sup> /h) @R500	0.005	0.008	0.0126	0.02	0.032
Permanent Flow Rate Q <sub>3</sub> (m <sup>3</sup> /h)	2.5	4	6.3	10	16
Overload Flow Rate Q <sub>4</sub> (m <sup>3</sup> /h)	3.125	5	7.875	12.5	20
End Connection	G3/4"	G1"	G1 1/4"	G1 1/2"	G2"
Length (mm)	165	195	225	180	200
Width (mm)	81	81	81	81	81
Height (mm)	100	100	118	128	135
Temperature	Medium Range: 0.1°C.....30/ 50/ 70°C (T30 / T50 / T70) Ambient temperature: 5~55 °C Storage temperature: -20~60 °C				
Pipe Materials	Brass 59-1				
Metrological Class	Class 2				
Ratio (Q <sub>3</sub> /Q <sub>1</sub> ) (optional)	R125, R160 (upto T70) R250, R400, R500 (upto T50)				
Maximum Admissible Pressure	1.6 MPa				
Pressure Loss	ΔP < 40 kPa				
Pressure Stage	PN16				
Installation Position	U5 / D3				
Protection Class (optional)	IP65 / IP68				
Battery Lifespan (optional)	3.6 VDC lithium battery, 6 / 10 / 16 years lifetime				
Data Storage (optional)	24/120 logs, daily / weekly / monthly				
Electromagnetic Environmental Class	E1				
Mechanical Environmental Class	M1				
Mechanical Environmental Conditions	B				
Interface & Communication (optional)	IrDA, LoRaWAN, Sigfox, NB-IoT, W-MBus, RS485, MBus, Pulse Output				
Assembly Orientation	H, V, H/ V				
Display and Indication	Unit: m <sup>3</sup> / Gallon (optional) LCD: 8-digits				

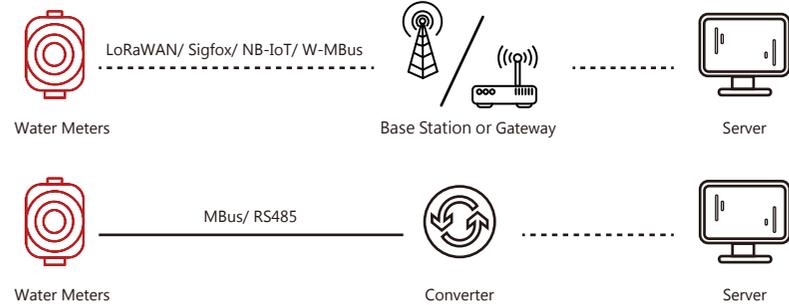


# **BECO Y**

**Ultrasonic Water Meter**



## How does it work?



BECO Y is a residential water meter made by nature friendly composite material. It is produced with high accuracy upto R800.

## Features



Flexible Battery Lifespan



Hot & Cold Water Suitable



Upto R800



Clean Water Supply (Environment Friendly)



AMR Ready (wired & wireless)



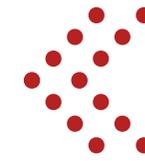
Durable Material

Pipe Diameter	DN15	DN20
Minimum Flow Rate Q <sub>1</sub> (m <sup>3</sup> /h) @R800	0.003125	0.005
Permanent Flow Rate Q <sub>3</sub> (m <sup>3</sup> /h)	2.5	4
Overload Flow Rate Q <sub>4</sub> (m <sup>3</sup> /h)	3.125	5
End Connection	G <sup>3</sup> / <sub>4</sub> '	G1'
Length (mm)	110 / 165(optional)	130
Width (mm)	78	78
Height (mm)	91	95
Temperature	Medium Range: 0.1°C.....30 /50/ 70°C (T30 / T50 / T70) Ambient temperature: 5~55 °C Storage temperature: -20~60 °C	
Materials	Composite Material	
Metrological Class	Class 2	
Ratio (Q <sub>3</sub> /Q <sub>1</sub> ) (optional)	R160, R250, R400, R500, R800	
Maximum Admissible Pressure	1.6 MPa	
Pressure Loss	ΔP < 63 kPa	
Pressure Stage	PN16	
Installation Position	U0 / D0	
Protection Class (optional)	IP68	
Battery Lifespan (optional)	3.6 VDC lithium battery, 6/ 10 / 16 years lifetime	
Data Storage (optional)	24 / 120 logs, daily / weekly / monthly	
Electromagnetic Environmental Class	E1	
Mechanical Environmental Class	M1	
Mechanical Environmental Conditions	B	
Interface & Communication (optional)	IrDA, LoRaWAN, Sigfox, NB-IoT, W-MBus, RS485, M-Bus	
Assembly Orientation	H, V, H / V	
Display and Indication	Unit: m <sup>3</sup> / Gallon (optional) LCD: 10-digits	



# B97 VPW

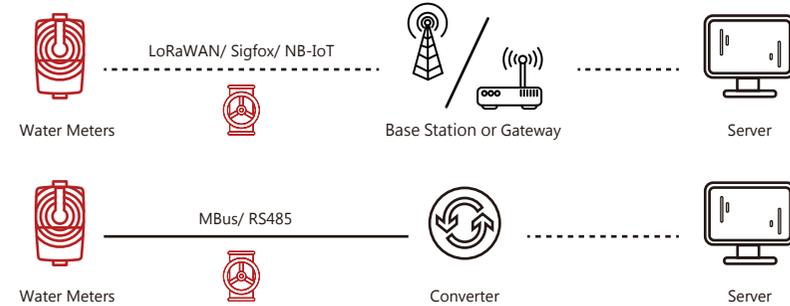
Valve Control / Prepaid Ultrasonic Water Meter



# B97 VPW

Valve Control / Prepaid  
Ultrasonic Water Meter

## How does it work?



B97 VPW is a high-precision Ultrasonic Water Meter with built-in valve. It is suitable for residential applications with controlling-water-supply requirement.

## Features



Solution for Addressing NRW



Water Proof



Compact Design



Built-in Valve



AMR Ready (wired & wireless)



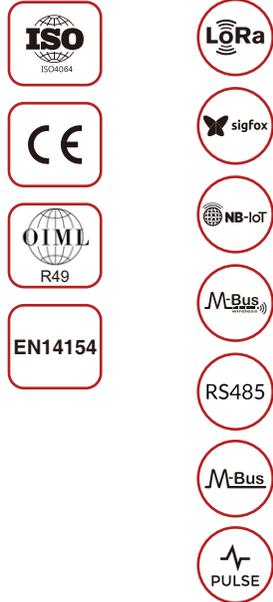
Durable Service Period

Pipe Diameter	DN15	DN20
Minimum Flow Rate Q <sub>1</sub> (m <sup>3</sup> /h) @R400	0.00625	0.01
Permanent Flow Rate Q <sub>3</sub> (m <sup>3</sup> /h)	2.5	4
Overload Flow Rate Q <sub>4</sub> (m <sup>3</sup> /h)	3.125	5
End Connection	G <sup>3</sup> / <sub>4</sub> "	G1"
Length (mm)	165	195
Width (mm)	90	100
Height (mm)	103	100
Temperature	Medium Range: 0.1°C.....30/ 50°C (T30 / T50) Ambient temperature: 5~55 °C Storage temperature: -20~60 °C	
Pipe Materials	Brass 59-1	
Metrological Class	Class 2	
Ratio (Q <sub>3</sub> /Q <sub>1</sub> ) (optional)	R160, R250, R400	
Maximum Admissible Pressure	1.6 MPa	
Pressure Loss	ΔP < 40 kPa	
Pressure Stage	PN16	
Installation Position (optional)	U5 / D3, U10 / D5	
Protection Class (optional)	IP65 / IP68	
Battery Lifespan (optional)	3.6 VDC lithium battery, 6 / 10 / 16 years lifetime	
Data Storage (optional)	24/120 logs, daily / weekly / monthly	
Electromagnetic Environmental Class	E1	
Mechanical Environmental Class	M1	
Mechanical Environmental Conditions	B	
Interface & Communication (optional)	IrDA, LoRaWAN, Sigfox, NB-IoT, RS485, M-Bus	
Assembly Orientation	H, V, H/V	
Display and Indication	Unit: m <sup>3</sup> / Gallon (optional) LCD: 8-digits	



# **B39 VW-M**

**Bulk Ultrasonic Water Meter**



B39 VW-M, the high-precision bulk Ultrasonic Water Meter with double flow sensing channels, developed for indoor/outdoor Commercial, District, Industrial, and Agricultural applications.

**Features**



Upto R500



Long Duration Life Time



Support Multiple Application



AMR Ready (wired & wireless)

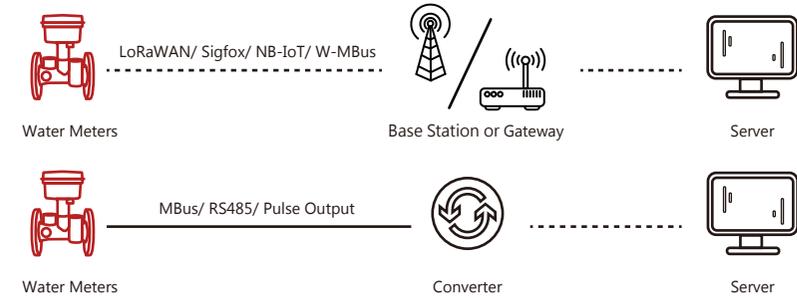


Main Pipe Supplying



Enlarged LCD

**How does it work?**



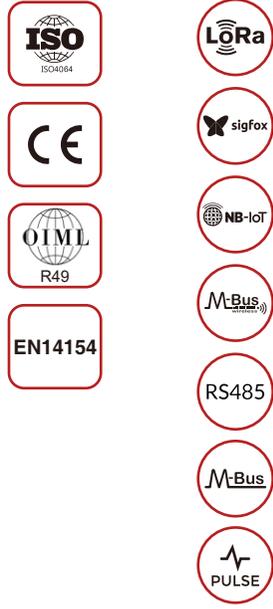
Model	Diameter DN (mm)	Nominal Flow	Transitional Q <sub>2</sub> (m <sup>3</sup> /h)	Minimum Q <sub>1</sub> (m <sup>3</sup> /h)@R500	Flange Outer	Length (mm)	Connection
DN50	50	25	0.08	0.05	165	200	4×M16
DN65	65	40	0.128	0.08	185	200	4×M16
DN80	80	63	0.2016	0.126	200	225	8×M16
DN100	100	100	0.32	0.2	220	250	8×M16
DN125	125	160	0.512	0.32	250	250	8×M16
DN150	150	250	0.8	0.5	280	300	8×M20
DN200	200	400	1.28	0.8	335	345	12×M20
DN250	250	630	2.016	1.26	405	445	12×M24
DN300	300	1000	3.2	2	460	500	12×M24
DN400	400	1600	5.12	3.2	580	600	16×M27
DN450	450	2500	8	5	640	650	20×M27
DN500	500	2500	8	5	715	600	20×M30
DN600	600	4000	12.8	8	840	600	20×M33

	Upto DN900, refer to BOVE for detail specs	
Temperature	Medium Range: 0.1°C.....30/ 50°C (T30 / T50) Ambient temperature: 5~55 °C Storage temperature: -20~60 °C	
Pipe Materials	Cast iron	
Metrological Class	Class 2	
Ratio (Q <sub>3</sub> /Q <sub>1</sub> ) (optional)	R125, R200, R250, R500	
Maximum Admissible Pressure	1.6 MPa	
Pressure Loss	ΔP < 40 kPa	
Flange Standard (optional)	ANSI, GB (DIN)	
Pressure Stage	PN16	
Installation Position	U10 / D5	
Protection Class (optional)	IP65 / IP68	
Battery Lifespan (optional)	3.6 VDC lithium battery, 6 / 10 / 16 years lifetime	
Data Storage (optional)	24/120 logs, daily / weekly / monthly	
Electromagnetic Environmental Class	E1	
Mechanical Environmental Class	M1	
Mechanical Environmental Conditions	B	
Interface & Communication (optional)	IrDA, LoRaWAN, Sigfox, NB-IoT, W-MBus, RS485, MBus, Pulse Output	
Assembly Orientation	H, V, H/ V	
Display and Indication	Unit: m <sup>3</sup> / Gallon (optional) LCD: 9-digits	

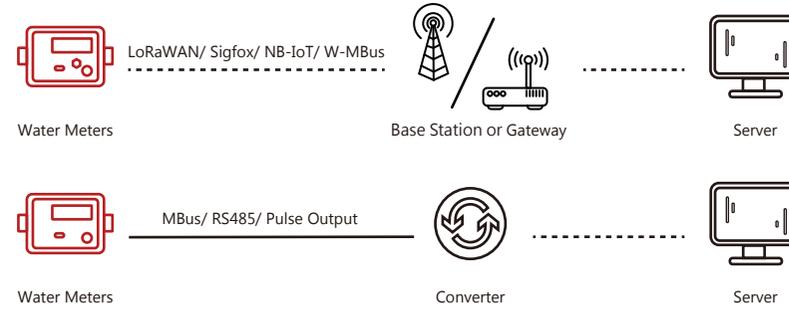


# **B9 VW**

**Split Ultrasonic Water Meter**



## How does it work?



B9 VW Ultrasonic Water Meter is developed for residential application. The calculator and flow sensor can be installed in compact or split.

## Features



Flexible Battery Lifespan



Proof of Humidity, Water and UV



IoT Ready



Multiple Dynamic Range Options (Q3/ Q1)

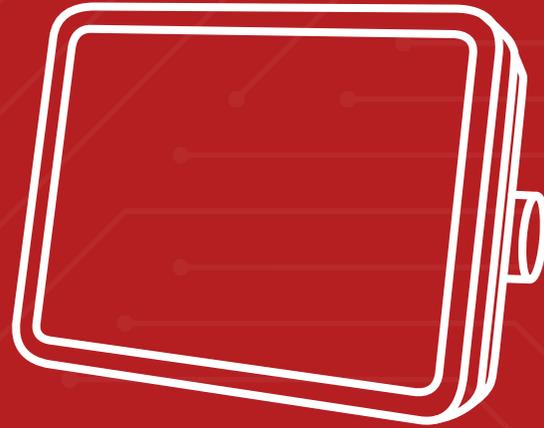


Split or Integrated Installation



Automatic Self Diagnosis and Fault Detection

Pipe Diameter	DN15	DN20	DN25	DN32	DN40
Minimum Flow Rate Q <sub>1</sub> (m <sup>3</sup> /h)@R500	0.005	0.008	0.0126	0.02	0.032
Permanent Flow Rate Q <sub>3</sub> (m <sup>3</sup> /h)	2.5	4	6.3	10	16
Overload Flow Rate Q <sub>4</sub> (m <sup>3</sup> /h)	3.125	5	7.875	12.5	20
End Connection	G <sup>3</sup> / <sub>4</sub> "	G1"	G1 <sup>1</sup> / <sub>4</sub> "	G1 <sup>1</sup> / <sub>2</sub> "	G2"
Length (mm)	165	195	225	180	200
Width (mm)	75	75	75	75	75
Height (mm)	89	94	104	114	119
Temperature	Medium Range: 0.1°C.....30/ 50 °C (T30 / T50) Ambient temperature: 5~55 °C Storage temperature: -20~60 °C				
Pipe Materials	Brass 59-1				
Metrological Class	Class 2				
Ratio (Q <sub>3</sub> /Q <sub>1</sub> ) (optional)	R160, R250, R400, R500				
Maximum Admissible Pressure	1.6 MPa				
Pressure Loss	ΔP < 40 kPa				
Pressure Stage	PN16				
Installation Position	U5 / D3				
Protection Class (optional)	IP65 / IP68				
Battery Lifespan (optional)	3.6 VDC lithium battery, 6 / 10 / 16 years lifetime				
Data Storage (optional)	24/120 logs, daily / weekly / monthly				
Electromagnetic Environmental Class	E1				
Mechanical Environmental Class	M1				
Mechanical Environmental Conditions	B				
Interface & Communication (optional)	IrDA, LoRaWAN, Sigfox, NB-IoT, W-MBus, RS485, MBus, Pulse Output				
Assembly Orientation	H, V, H/ V				
Display and Indication	Unit: m <sup>3</sup> / Gallon (optional) LCD: 8-digits				



# **B12 VI-B**

**Ultrasonic Heat Meter**



B12 VI-B, the high-precision Ultrasonic Heat Meter, developed for Split or Integrated installation scenario. It can measure both heating and cooling energy. Various communications make it to be suitable for different applications.

## Features



Flexible Battery Lifespan



Pinpoint Measuring Accuracy



Split or Integrated Installation



Insensitive Against Lime & Sand

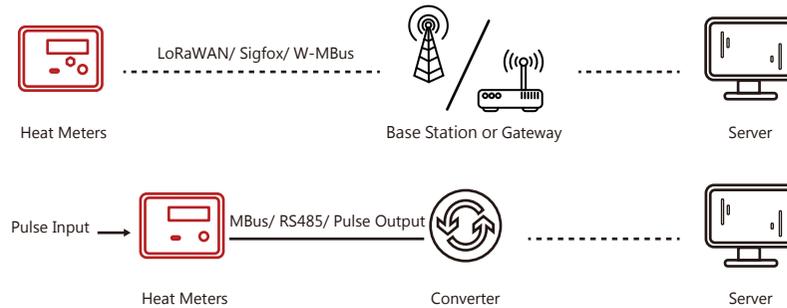


IoT Ready

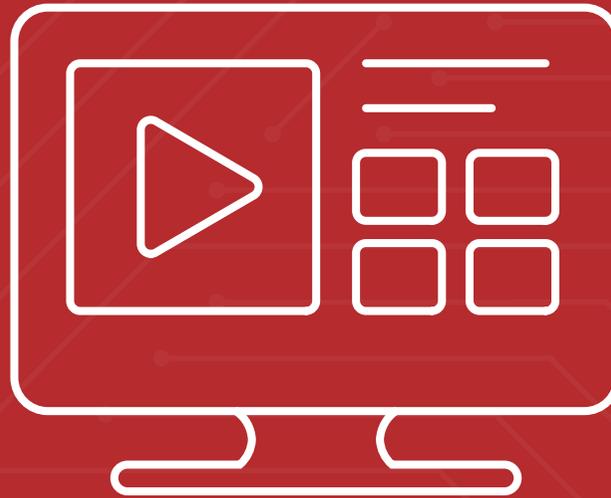


Automatic Self Diagnosis and Fault Detection

## How does work?



Pipe Diameter	DN15	DN20	DN25	DN32	DN40
Minimum Flow Rate, $q_i$ (m <sup>3</sup> /h)	0.03	0.05	0.07	0.12	0.2
Permanent Flow Rate, $q_p$ (m <sup>3</sup> /h)	1.5	2.5	3.5	6	10
Maximum Flow Rate (m <sup>3</sup> /h)	3	5	7	12	20
End Connection	G3/4"	G1"	G1 1/4"	G1 1/2"	G2"
Length (mm)	110	130	160	180	200
Width (mm)	96	105	114	120	130
Temperature	Range: 4°C - 95°C, T: 3k - 65k				
Temperature Sensor	A pair of PT1000 platinum resistor				
Metrological Class	Class 2				
Maximum Admissible Pressure	1.6 MPa				
Pressure Loss @qp	ΔP < 25 kPa				
Pressure Stage	PN16				
Protection Class (optional)	IP65 / IP68				
Battery Lifespan (optional)	3.6 VDC lithium battery, 6 / 10 / 16 years lifetime				
Data Storage (optional)	36 logs, monthly				
Electromagnetic Environmental Class	E1				
Mechanical Environmental Class	M1				
Mechanical Environmental Conditions	B				
Interface & Communication(optional)	IrDA, M-Bus, RS485, Pulse Output, LoRaWAN, Sigfox, W-MBus, Pulse Input				
Assembly Orientation	H, V, H/V				
Display and Indication	Unit: kWh, MWh, GJ (optional) LCD: 8-digits				



# Alpaca-E AMI

Remote Reading and Controlling System



Alpaca-E AMI System is a smart metering platform for meter data collecting, remote valve controlling, visualization, and device management. It enables meter connectivity via diverse communications – LoRaWAN, NB-IoT, GPRS, etc.

Alpaca-E AMI system can also be configured with API to perfectly integrate with utility's own management platform.

## Features



Meter Geo Information



Asset Management



Report Management



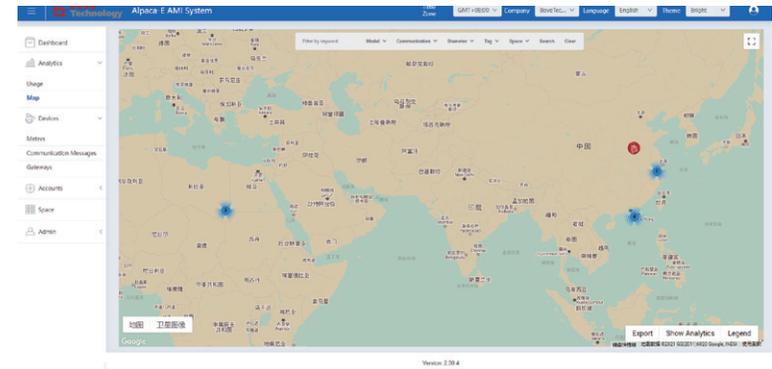
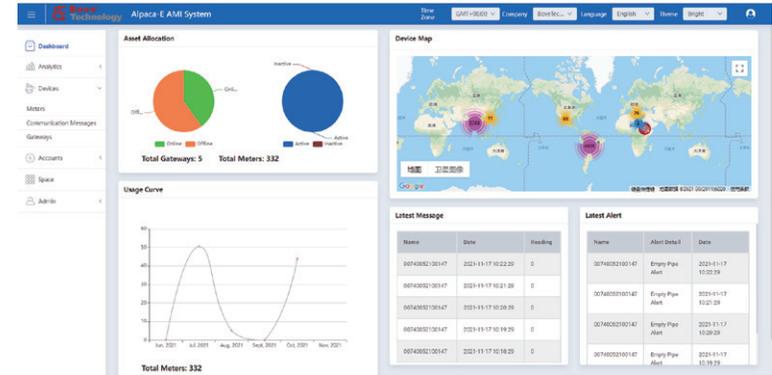
Timezone Setting



Smart Alarms

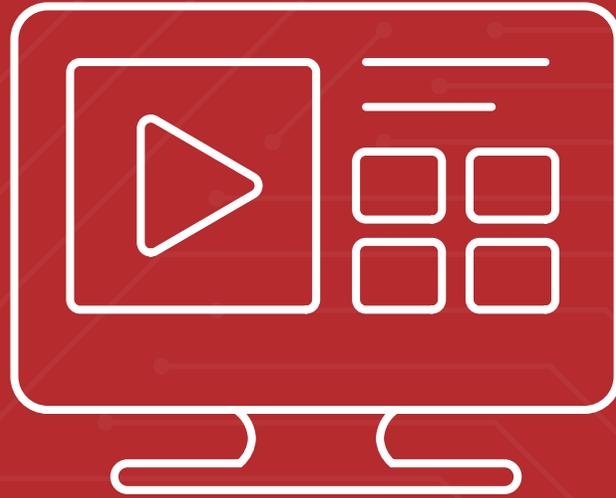


Remote Monitoring



The screenshot displays the 'Meter List' table in the 'Alpaca-E AMI System' dashboard. The table lists individual meters with their status, names, communication methods, and models.

No.	Meter Status	Name	Communication	Meter Model	Last Communication	Latest Reading	Created On	Action
1	Active	00740002100147	LoRaWAN	836 VV	2021-11-17 10:22:29	0	2021-11-09 11:23:05	
2	Active	meterTest	LoRaWAN	836 VV	2021-11-17 10:18:15	1.96	2020-07-28 17:16:24	
3	Active	00740002100171	GPRS	8000 X880	2021-11-17 10:16:22	0	2021-11-17 08:14:41	
4	Active	3802169	LoRaWAN	836 VV	2021-11-17 10:11:13	0.34	2020-07-29 13:32:47	
5	Active	007401102100122	GPRS	8000 X880	2021-11-17 10:08:44	0	2021-11-17 08:52:50	
6	Active	380197602	LoRaWAN	891 DN15-40	2021-11-17 09:54:54	0	2021-09-28 14:47:07	
7	Active	8889563956	LoRaWAN	836 VV	2021-11-17 09:54:05	0	2020-09-17 09:17:00	
8	Active	350300154	LoRaWAN	891 DN15-40	2021-11-17 09:48:04	0	2021-09-31 16:57:31	
9	Active	380197571202	LoRaWAN	891 DN15-40	2021-11-17 09:27:46	0.103	2021-09-17 10:28:45	
10	Active	Ask Bridge-Relay	LoRaWAN	Communication	2021-11-17 07:28:36	0	2020-12-25 09:29:54	



# Alpaca-V

Prepaid Vending System



Alpaca-V Prepaid Vending System is a robust, scalable water meter vending system. Alpaca-V Prepaid Vending System perfectly work with Bove's prepaid water meter B95 VPW which enable utilities to manage their water revenue and supply.

**Features**



Billing Report



Token Management



Smart Alerts



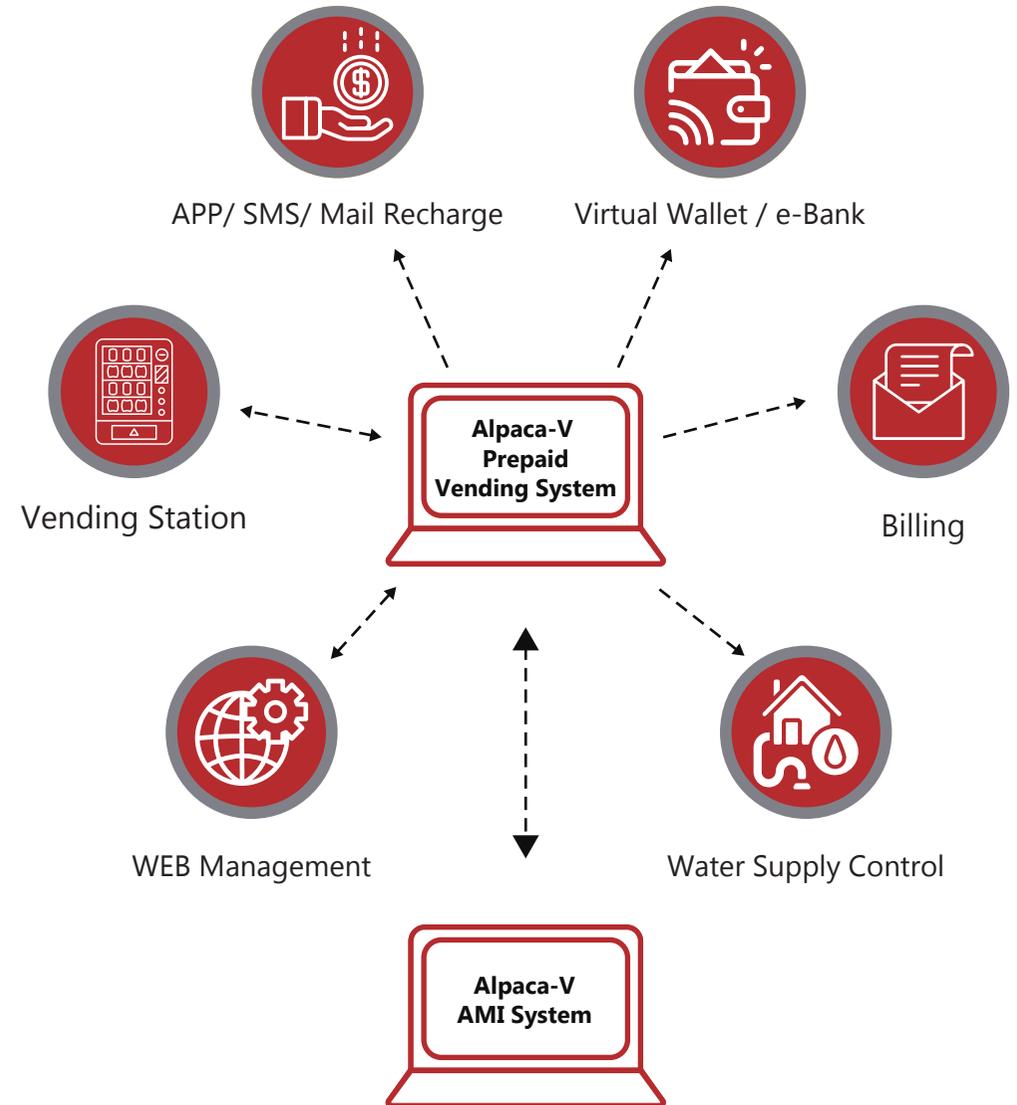
Service Plan Switch

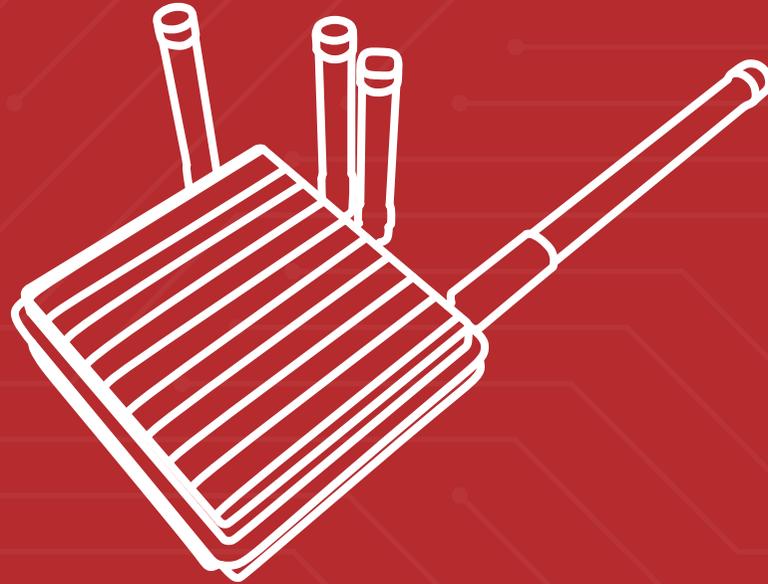


Vending Management



Multi Platforms



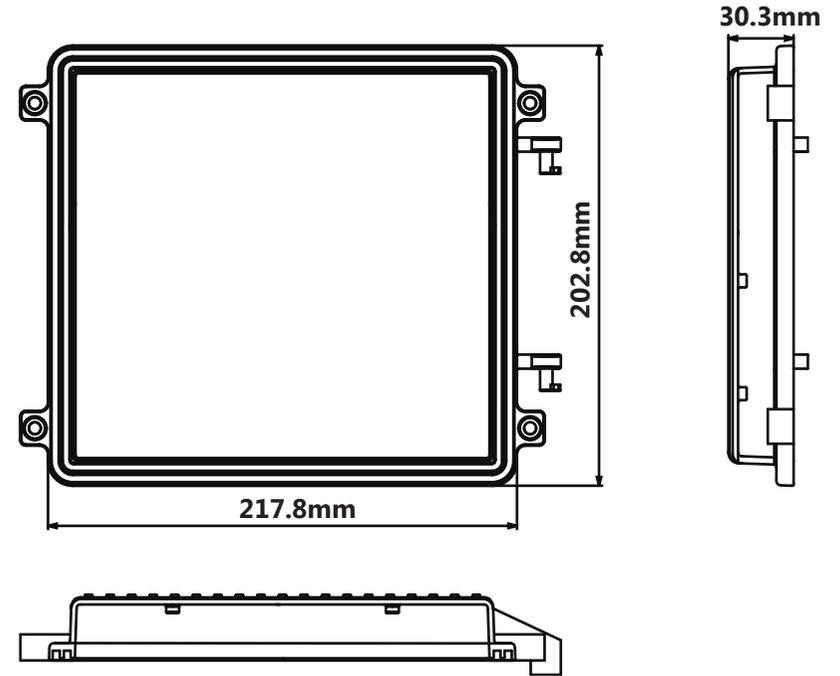


# Walrus LoRaWAN-OD Gateway

# Walrus LoRaWAN-OD Gateway



Walrus LoRaWAN-OD Gateway is a well-built, full-duplex, outdoor gateway. Embedded in the Linux operating system, the main control chip is the powerful ARM Cortex-A53 platform, with a maximum frequency of 1.2GHz.



## Features



Power Supply : DC jack, PoE and Internal LiFePO4 Battery



USB Interface for Debug



Upto 4hrs Duration Time with Backup Battery



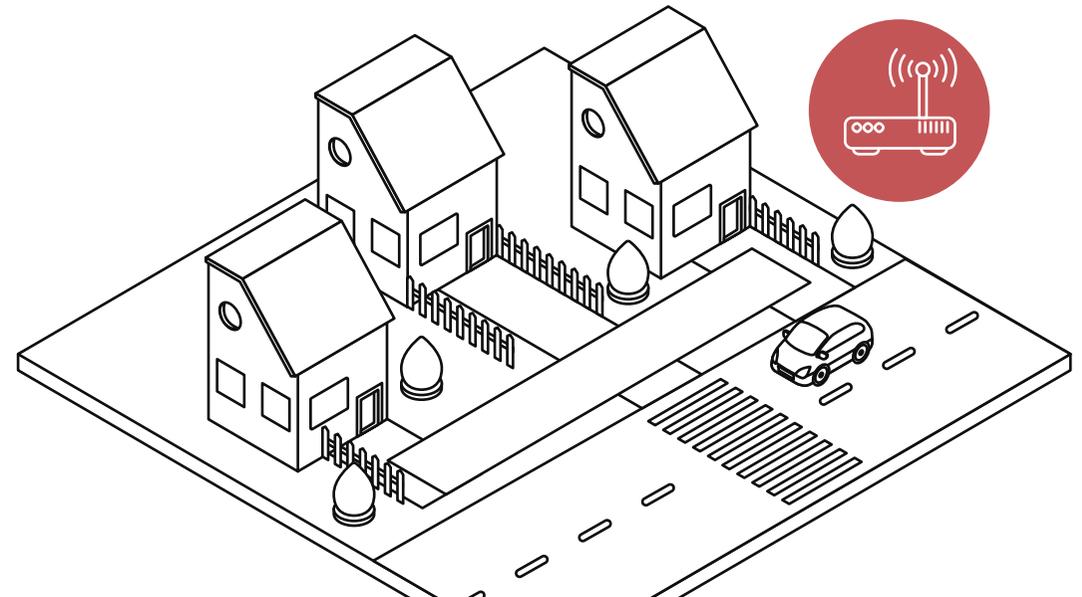
Maximum Output Power: 27dBm  
LoRaWAN Antenna Gain: 2dBi  
High Sensitivity: -141dBm@300bps

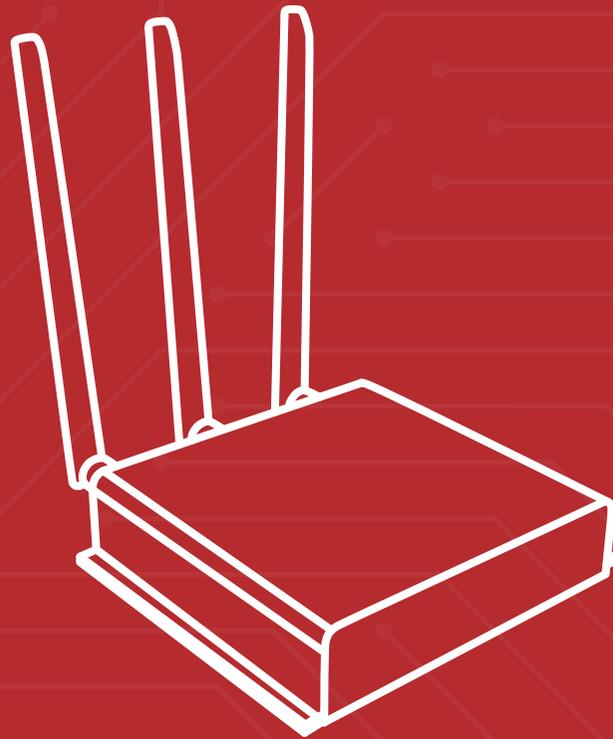


IP67 Waterproof Level



10KA Surge Protection



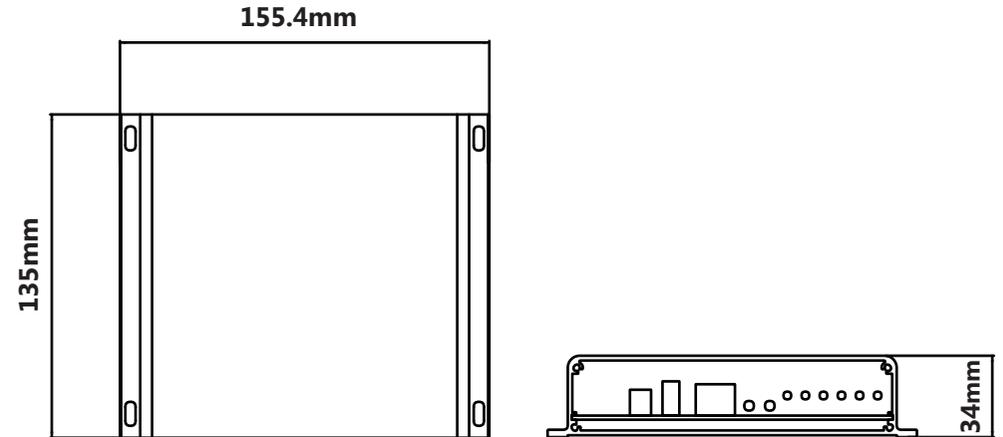


# Walrus LoRaWAN-ID Gateway

# Walrus LoRaWAN-ID Gateway



Walrus LoRaWAN-ID Gateway is an indoor IoT gateway based on LoRaWAN and targets to LPWAN network. The GW could support LoRaWAN Class A/C protocol and Wi-Fi IEEE 802.11b/g/n standard.



## Features



Maximum Output Power: 25dBm  
High Sensitivity: -142dBm@300bps

Support Ethernet, LTE4G and  
WiFi Backhaul Data



Power Supply : DC jack



10/100M Ethernet

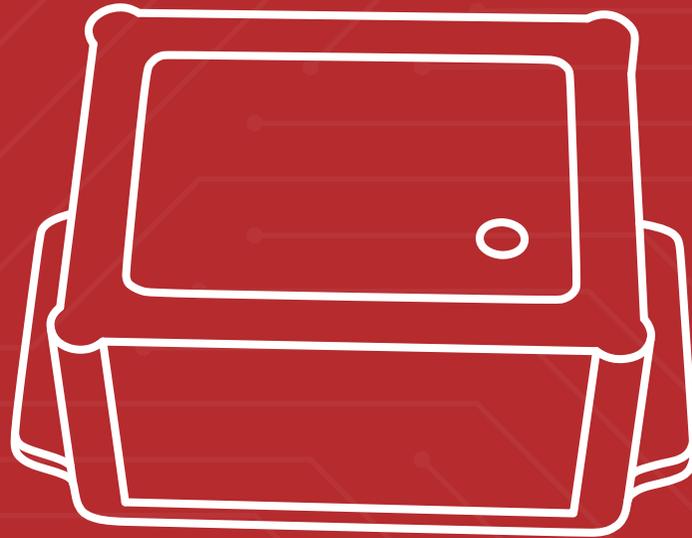


IP65 Waterproof Level



Wide Operating Temperature Range





# LoraWAN Bridge Relay



Communication



Spider model LoRaWAN bridge relay resolves the issue that terminals are not well communicating with LoRaWAN gateways. It works as an intermediate in between to connect the terminal devices when the installation scenario is complicated.

**Features**



Built-in High-performance Antenna



Battery Life Up to 3 Years  
Battery Changeable



Low Power Consumption:  
Sleep Current 1.9uA



Supports OTA Upgrade

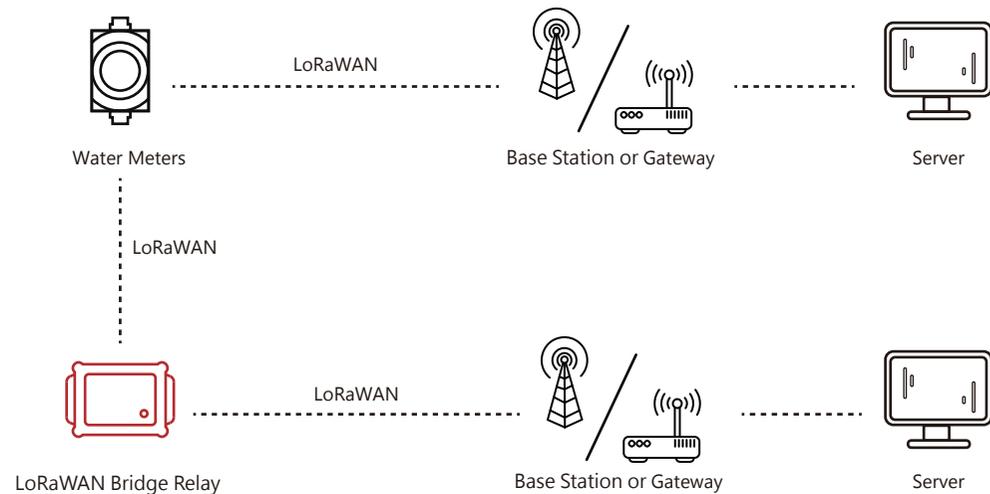


IP67 Waterproof

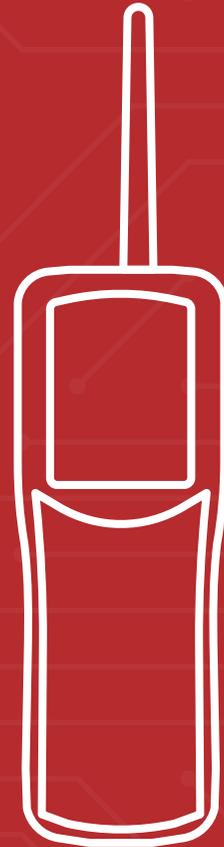


Support Global LoRaWAN Frequency

**How does it work?**



**Case:** Connecting 15 endnode terminals on a 12 hours transmission interval, battery life is 3 years.



# Jurgen Hand-Held Unit



Jurgen Hand-Held Unit is a LoRaWAN HHU that suitable for Walk-by / Drive-by solution. HHU can be used for remote meter reading, remote valve operation, RF noise analysis, packet error detection, etc.

### Features



Walk-by / Drive-by



RF Noise Analysis



LoRaWAN Technology



Remote Controlling

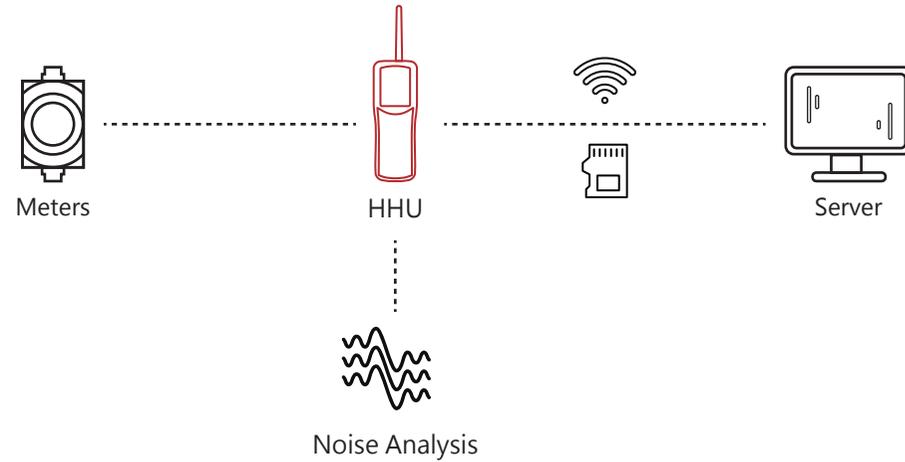


Dual Data Upload

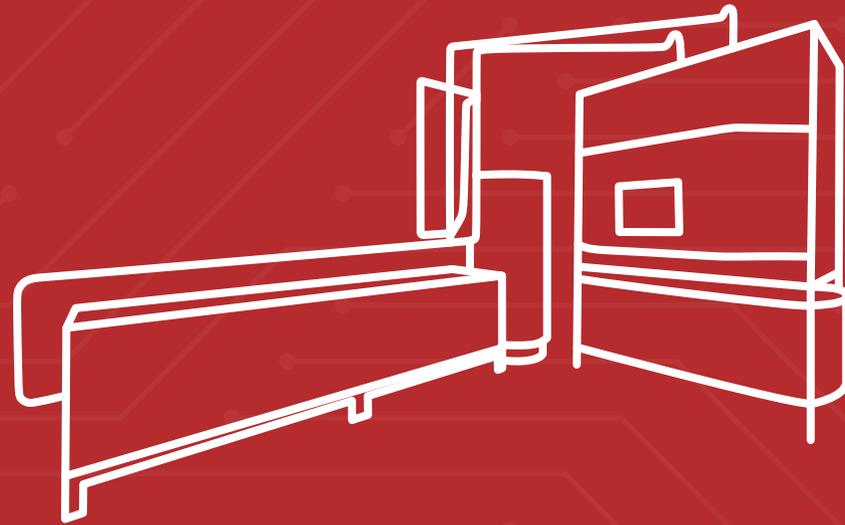


Industrial Design

### How does it work?



Items	Parameter	Specifications
Hardware	Module	LoRa module, GPS module, WIFI / BLE module
	Sensor	Temperature Sensor
	Kernel	STM32476X
	Clock	12MHz
	Size (mm)	167*67*27
	Interface	Mini USB
	Power supply	Rechargeable built-in lithium battery
	Storage	SD memory card
	Standby Current (Interview Screen)	21.8 mA
	Shutdown Leakage Current	36 uA
	Transmit Power	20dBm max@434MHz/470MHz 20dBm max @868MHz/915MHz
	Receiving Sensitivity	-139dBm @SF12, BW125kHz, 434MHz/470MHz -137dBm @SF12, BW125kHz, 868MHz/915MHz
	TTF ( Open Area )	30 s
	ESD	Contact discharge Air discharge ±4KV
Software	System	RT Thread
	Firmware upgrade	USB upgrade
	SD Card File System	FAT32



# B28 VTB

Calibration and Testing Bench



B28 VTB bench is designed for heat meter / water meter calibration and testing procedure. With BOVE's unique design of flow system, weighting system, it supports any ranges of sizing from DN15 to DN600.

## Features



Excellent Structural Design



Cone Shape Water Tank



Automatic HD Photography Technology



High Sensitive Diverter Valve

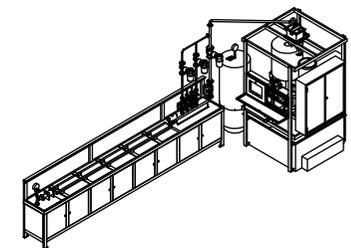
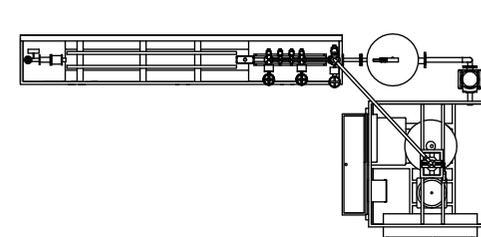
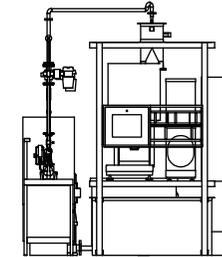
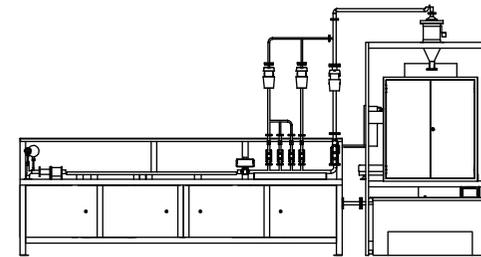


Multiple Configuration of Electronic Scale



Various Configuration of Master Flow Meter

## Reference Structure



Measuring Principle	Weighing or Volumetric Methods and comparison with master flow meter
Testing Method	Flying Start-Stop, Standing Start-Stop
Applicable Standard	ISO4064 OIML R49 JIG164
Medium Temperature (optional)	5 °C - room temperature (with chiller) Room temperature - 95 °C (with heater) 5 °C - 95 °C (with chiller and heater)
Uncertainty	Less than 0.2%
Ambient Temperature	5 °C - 40 °C
Accumulated Flow	±0.2% ~ ±0.5%
Working Pressure	0.3-0.6 MPa
Accuracy	Max Class 3
Heat Energy	±0.3% ~ ±0.5%
Starting Flow Rate	As low as 2L/H



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