



User Manual for WAFS-1100 Vortex
Flow Sensor

Compressed Air Energy Saving Solutions

Smart Measurement Technology That You Can Trust

About Us

At WiseAir Technologies, our mission is to empower industries with innovative and advanced measurement solutions for compressed air and gases. With over 20 years of expertise in the field of compressed air management, we have developed smart, reliable, and state-of-the-art products that are both accurate and easy to use. Our focus is on incorporating cutting-edge technologies like M2M communication and the Industrial Internet of Things (IIoT) to bring increased automation, improved communication, and self-monitoring to industrial processes.

Our WA range of smart IIoT sensors can be easily integrated into existing manufacturing and energy management software to enhance data collection, exchange, and analysis for improved productivity and efficiency.

Our Network

Our Smart Sensors are Developed with Design and Technology Support from Our Partners Across North America, Europe and Asia. With Our Strong Network of Partners, we offer Seamless and Best-in-Class Service to Our Customers.



Artificial Intelligence and Machine Learning Software

Our software are programmed to analysis and self Diagnose the Measured Datas



Smart IIoT Sensors

For measurement of Flow, Power, Dew Point and Pressure



Product Experts

Product Specialists with Decades of Experience in Compressed Air Measurement and Management

Simplify Your Compressed Air Management With Our Smart Technology

Compressed Air Systems are Dynamic and Highly In-Efficient. Hence they Require Continuous Monitoring for Sustained Benefits. With Our WiseAir 4.0 Smart Sensors and M2M / AI Softwares Your Compressed Air System is Measured, Analysed and Improved Over Time.

With Our Seamless and Detailed Analytical Reports You Can Keep Track Of Your Compressed Air Systems Efficiency with Minimal Human Intervention.

Our Services

We Offer Free Assessment Services to Identify the HotSpots For Improvements and Develop Road Maps for Sustainable Results. Our Product Specialists Can Also Offer You Customised Plans for Monitoring the Key Performance Factors Of Your Compressed Air System.

Connect with Our Expert Product Specialists to Learn How Your Factory Can Begin to Realize Energy and Cost Savings with Our Advanced Solutions.

Call Us

Asia : +91 90477 78715
Europe : +45 36 99 04 22

Email Us

Asia : info@wiseair.asia
Europe : info@wiseair.asia

Understand The True Costs Of Compressed Air

In a Compressor's Life Cycle More than 80 % of its Operating Costs is Spent Towards its Energy. Hence Monitoring and Managing Compressors at their Peak Energy Efficiency will give Significant Energy Savings.

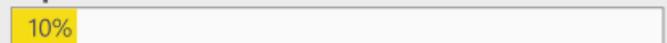
Our Smart Sensors Can Provide Vital Informations Like Flow, Power, Dew Point and Pressure. When Our Sensors are Networked with Our AI Software Programs, All the Measured Datas are Analysed and Reported To You With Suggested Action Plans in Real Time.

Manage Your Compressed Air System Efficiently and Effortlessly With Our WiseAir Smart Sensors and AI Softwares.

Energy Costs



Capital Costs



Maintenance Costs



About Us

At WiseAir Technologies, our mission is to empower industries with innovative and advanced measurement solutions for compressed air and gases. With over 20 years of expertise in the field of compressed air management, we have developed smart, reliable, and state-of-the-art products that are both accurate and easy to use. Our focus is on incorporating cutting-edge technologies like M2M communication and the Industrial Internet of Things (IIoT) to bring increased automation, improved communication, and self-monitoring to industrial processes.

Our WA range of smart IIoT sensors can be easily integrated into existing manufacturing and energy management software to enhance data collection, exchange, and analysis for improved productivity and efficiency.

Our Network

Our Smart Sensors are Developed with Design and Technology Support from Our Partners Across North America, Europe and Asia. With Our Strong Network of Partners, we offer Seamless and Best-in-Class Service to Our Customers.



Artificial Intelligence and Machine Learning Software

Our software are programmed to analysis and self Diagnose the Measured Datas



Smart IIoT Sensors

For measurement of Flow, Power, Dew Point and Pressure



Product Experts

Product Specialists with Decades of Experience in Compressed Air Measurement and Management

Simplify Your Compressed Air Management With Our Smart Technology

Compressed Air Systems are Dynamic and Highly In-Efficient. Hence they Require Continuous Monitoring for Sustained Benefits. With Our WiseAir 4.0 Smart Sensors and M2M / AI Softwares Your Compressed Air System is Measured, Analysed and Improved Over Time.

With Our Seamless and Detailed Analytical Reports You Can Keep Track Of Your Compressed Air Systems Efficiency with Minimal Human Intervention.

Our Services

We Offer Free Assessment Services to Identify the HotSpots For Improvements and Develop Road Maps for Sustainable Results. Our Product Specialists Can Also Offer You Customised Plans for Monitoring the Key Performance Factors Of Your Compressed Air System.

Connect with Our Expert Product Specialists to Learn How Your Factory Can Begin to Realize Energy and Cost Savings with Our Advanced Solutions.

Call Us

Asia : +91 90477 78715
Europe : +45 36 99 04 22

Email Us

Asia : info@wiseair.asia
Europe : info@wiseair.asia

Understand The True Costs Of Compressed Air

In a Compressor's Life Cycle More than 80 % of its Operating Costs is Spent Towards its Energy. Hence Monitoring and Managing Compressors at their Peak Energy Efficiency will give Significant Energy Savings.

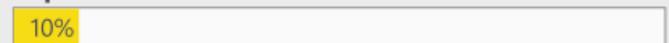
Our Smart Sensors Can Provide Vital Informations Like Flow, Power, Dew Point and Pressure. When Our Sensors are Networked with Our AI Software Programs, All the Measured Datas are Analysed and Reported To You With Suggested Action Plans in Real Time.

Manage Your Compressed Air System Efficiently and Effortlessly With Our WiseAir Smart Sensors and AI Softwares.

Energy Costs



Capital Costs



Maintenance Costs



Section	Title	Page
About Us		2
1	Safety Instructions	6
1.1	General Safety Instructions	6
1.2	Storage and Transport Safety	7
2	Product Overview	8
2.1	Product Introduction	8
2.2	Functions and Features	8
2.3	Technical Data	9, 10
2.4	Measuring Range	11
3	Product Dimensions and Installation	12
3.1	Dimensions (in mm)	12
3.2	Installation	13 to 16
3.3	Electrical Connection	17
4	Setting	18 to 19
5	Signal Output	20
6	Communication Protocols	21
6.1	Communication Parameters	21
6.2	Storage Register Definitions	21

Section	Title	Page
6.3	Process Data Format	21
6.4	Byte order	21
6.5	Holding Register : Process Data Address table	22 to 28
7	Warranty Clause	30

1 Safety Instructions

1.1 General Safety Instructions

⚠ Warning – Compressed Air Hazard

Contact with rapid air leaks or pressurized parts of the compressed air system can cause severe injury or even death.

Use only pressure-resistant installation materials.

Avoid direct personal contact with rapid air leaks or pressurized parts of the instrument.

Always ensure that the system is fully depressurized before performing any maintenance operations.

⚠ Warning – Electrical Hazard

Contact with electrical parts of the product can cause severe injury or even death.

Follow all applicable electrical installation regulations and safety standards.

Disconnect the power supply before performing any repair or maintenance work.

All electrical work must be carried out only by authorized and qualified personnel.

⚠ Attention – Operating Conditions

This product must be used only within the specified operating conditions. Failure to comply may result in equipment malfunction, damage to the instrument, or even system failure.

Ensure compliance with national regulations during preparation, installation, and operation.

Do not use this product in explosive or hazardous areas.

Operate only within the specified temperature and pressure limits.

Do not disassemble the product without manufacturer's authorization.

Always use appropriate tools when the product is in operation.

⚠ Attention – Maintenance and Accuracy

Improper installation or lack of maintenance can result in inaccurate measurements, leading to incorrect operational decisions.

Ensure the product is properly installed and maintained regularly.

In the event of malfunction, contact a qualified technician or authorized service provider.

1.2 Storage and Transport Safety

Transport temperature range: -30 °C to +70 °C.

Storage temperature range: 0 °C to +40 °C.

Always use the original packaging for storage and transport to prevent mechanical damage.

Avoid direct exposure to sunlight and ultraviolet (UV) radiation.

Storage humidity must be below 70%, non-condensing.

2.1 Product Overview

The WAFS-1100 Vortex Flow Meter operates on the Kármán vortex principle to accurately measure the volume flow of gases, steam, or liquids. It is widely adopted in industrial applications due to its high reliability, resistance to contamination, and simplified structure.

Equipped with a high-sensitivity dual vortex sensor, the WAFS-1100 can simultaneously capture both flow signals and disturbance signals. Using advanced algorithms, the flow meter automatically distinguishes between genuine flow signals and external disturbances such as vibration or electromagnetic interference.

Powered by a high-performance DSP and the newly developed Digital Spectrum Analysis (DSA) technology, the WAFS-1100 delivers:

- Extended low-end measuring capability
- Wide turndown ratio
- Strong anti-vibration and anti-disturbance performance
- High measurement accuracy
- Excellent long-term stability

The flow meter is designed with an explosion-proof structure, making it suitable for use in demanding and hazardous environments.

Explosion-Proof Rating: Ex db IIC T6 Gb / Ex tb IIIC T80°C Db

Protection Class: IP67

2.2 Functions and Features

- Wide Measurement Range – Accurately measures flow rates as low as 1.5 m/s (actual flow).
- Versatile Applications – Suitable for compressed air (including dirty and wet), oxygen, natural gas, steam, and other industrial gases.
- Ultra-Sensitive Dual Vortex Sensor – Enhances accuracy and extends turndown ratio.
- Explosion-Proof Design – Certified for hazardous environments:
 - Explosion-Proof Class: Ex db IIC T6 Gb / Ex tb IIIC T80°C Db
 - Protection Class: IP67
- High-Performance DSP with DSA Technology – Digital Spectrum Analysis ensures precise flow signal detection while suppressing vibration and electromagnetic disturbances.
- Electrically Isolated Design – Fully isolated circuitry eliminates external electrical interference.
- Integrated Pressure & Temperature Sensors – Enables real-time monitoring of operating conditions.
- No Moving Parts – Ensures durability, low pressure drop, and minimal maintenance.
- Flexible Output Options – Supports Modbus RTU (RS485), 4–20 mA analog output, and pulse output.
- Wireless Connectivity – Built-in Bluetooth for convenient setup and data transfer.
- Capacitive Touch 2.0" IPS LCD – Ultra-wide viewing angle with a user-friendly, multi-functional Human-Machine Interface (HMI).
- Rugged Construction – Fully welded body design ensures superior corrosion resistance and withstands high pressure and temperature conditions.

2 Product Overview

2.3 Technical Data

Flow	
Measuring Range (DN65)	1.5 m/s ... 80 m/s (Gas & Steam) 0.15 m/s ... 8 m/s (Liquid)
Accuracy	Class 1.0
Repeatability	±0.2 %RD
Reference Condition	20 °C, 1 bar(a) - ISO 1217 (Configurable)
Pressure	
Measuring Range	0 ... 1.7MPa(a) (6.3MPa Option)
Accuracy	±0.5 %FS
Temperature	
Medium Temperature	-40 ... +160 °C (Standard)
Accuracy	±0.5 °C (±1.0 %FS @ > 100 °C)
Power	
Power	18 ... 30 VDC, 10 W @ 24 VDC
Display	
Display	2.0" IPS LCD with capacitive touch
Output	
4~20 mA Output (Standard)	Flow rate / Temperature / Pressure (Configurable)

Frequency Output (Standard)	Actual flow rate
Pulse (Standard)	Consumption / Alarm
Digital Output (Standard)	Modbus RTU (RS485) HART (Option)
Wireless Communication	Bluetooth Wi-SUN (Option) IOT-4G (Option)
Connector	Wiring terminal
Operating Environment	
Environment Temperature	-40 ... +85 °C
Environment Humidity	0 ... 95 %RH
Explosion-proof Class & Protection Code	
Explosion-proof Class	Ex db IIC T6 Gb / Ex tb IIIC T80°C Db
Protection Code	IP67
Other	
Process Connection	Wafer-type / Flange-type
Product Material	Main Body : 304 / 316L Vortex Snesor : 316L Meter Housing : Aluminum / Stainless steel
EMC	Compliant with IEC 61326-1

2 Product Overview

2.4 Measuring Range

Inch	DN	ID (mm)	Flow Velocity (m/s)	Flow Rate (m ³ /h)
1/2	15	15	5.5 ... 80	3.5 ... 50.9
3/4	20	20	5.0 ... 80	5.7 ... 90.4
1	25	25	4.0 ... 80	7.1 ... 141.3
1 ^{1/4}	32	32	3.0 ... 80	8.7 ... 231.5
1 ^{1/2}	40	40	2.0 ... 80	9.0 ... 361.7
2	50	50	1.5 ... 80	10.6 ... 565.2
2 ^{1/2}	65	65	1.5 ... 80	17.9 ... 955.2
3	80	80	1.5 ... 80	27.1 ... 1446.9
4	100	100	1.5 ... 80	42.4 ... 2260.8
5	125	125	1.5 ... 80	66.2 ... 3532.5
6	150	150	1.5 ... 80	95.4 ... 5086.8
8	200	200	1.5 ... 80	169.6 ... 9043.2
10	250	250	1.5 ... 80	265.1 ... 14130.0
12	300	300	1.5 ... 80	381.7 ... 20347.2

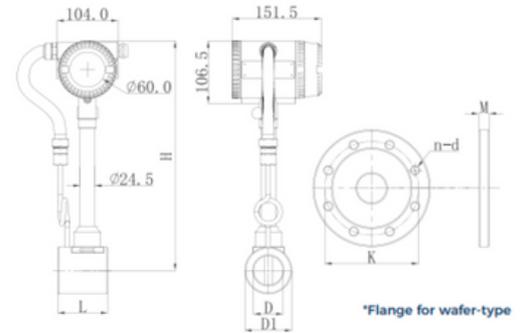
* The above is the gas flow range. Steam, liquid and other medium flow range, please consult the sale staff.

3 Product Dimensions and Installation

3.1 Dimensions (in mm)

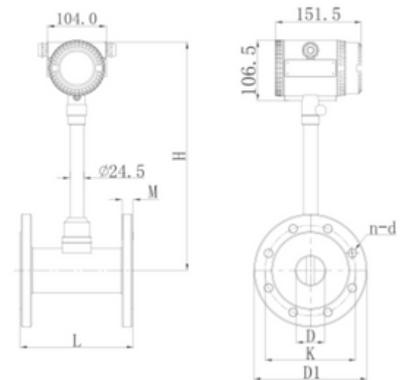
WAFS-1101

DN	Inch	D Pipe inner diameter (mm)	D1 Pipe outer diameter (mm)	H Pipe center to top of housing (mm)	L Total length (mm)	M Flange thickness (mm)	n Number of flange holes	K Screw hole center distance (mm)	d Screw hole diameter (mm)
32	1 ^{1/4}	32	63	375	100	18	4	100	18
40	1 ^{1/2}	40	78	380	100	18	4	110	18
50	2	50	81	380	100	19	4	125	18
65	2 ^{1/2}	65	97	390	100	20	4	145	18
80	3	80	113	395	100	20	8	160	18
100	4	100	131	405	101	22	8	180	18
125	5	125	158	420	103	22	8	210	18
150	6	150	184	430	103	24	8	240	22
200	8	200	232	455	135	26	12	295	22
250	10	250	282	480	145	28	12	355	26



WAFS-1102

DN	Inch	D Pipe inner diameter (mm)	D1 Pipe outer diameter (mm)	H Pipe center to top of housing (mm)	L Total length (mm)	M Flange thickness (mm)	n Number of flange holes	K Screw hole center distance (mm)	d Screw hole diameter (mm)
32	1 ^{1/4}	32	140	405	200	18	4	100	18
40	1 ^{1/2}	40	150	410	200	18	4	110	18
50	2	50	165	420	200	19	4	125	18
65	2 ^{1/2}	65	185	430	200	20	4	145	18
80	3	80	200	440	200	20	8	160	18
100	4	100	220	450	200	22	8	180	18
125	5	125	250	460	200	22	8	210	18
150	6	150	285	480	200	24	8	240	22
200	8	200	340	505	200	26	12	295	22
250	10	250	405	530	250	28	12	355	26



3 Product Dimensions and Installation

3.2 Installation

Selection of Installation Location and Environment

1. Avoid areas near strong electrical equipment, high-frequency variable frequency drives, or heavy power switching devices.
2. Do not install close to high-temperature or radiant heat sources. For outdoor installations, provide proper sunshade and rain protection.
3. Avoid locations with excessive vibration or highly corrosive environments. Always consider ease of access for installation and maintenance.

Proper Installation Orientation

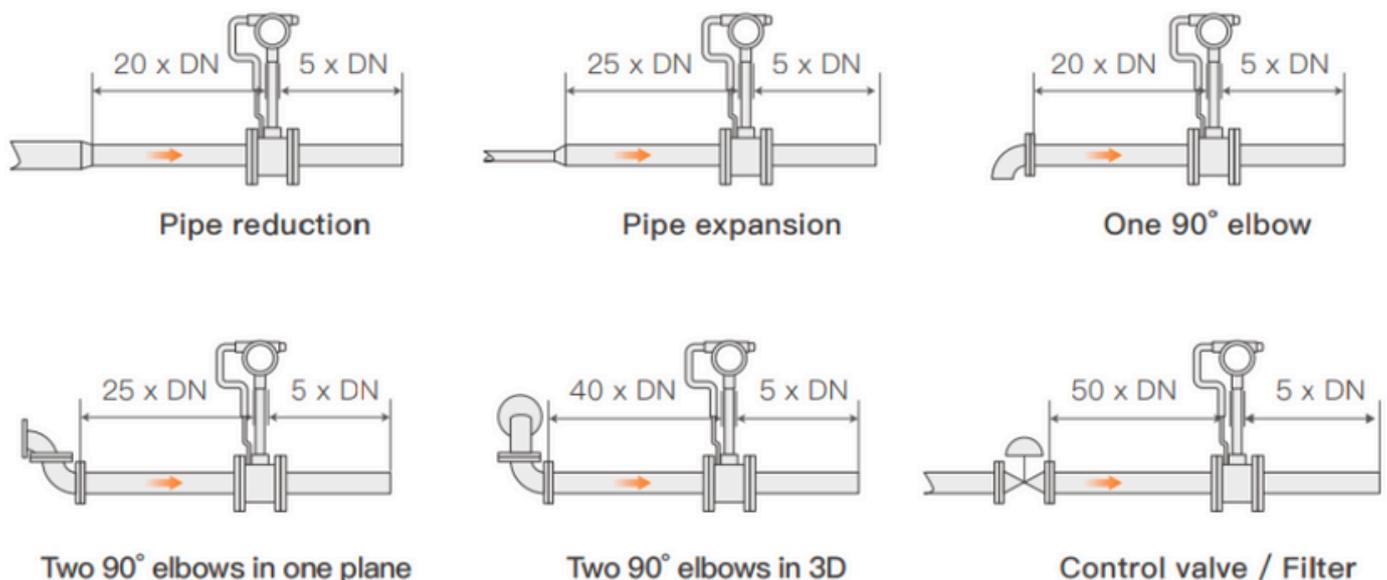
1. Choose a pipeline section with minimal vibration. If unavoidable, use vibration-reducing measures such as flexible joints or dampers.
2. The flow meter may be installed horizontally, vertically, or at an incline, but never upside down.

Recommended Straight Pipe Lengths

For accurate measurement, provide sufficient straight pipe sections upstream and downstream of the flow meter. Avoid placing fittings, bends, or valves immediately before the flow meter, as these can disturb the flow profile.

Refer to Figure 3-1 for the minimum straight pipe length requirements under different piping conditions.

* DN : Pipe inner diameter



Installation Methods and Welding of the Flow Meter

Wafer-Style Installation (Model: WAFS-1101)

Use the dedicated supporting pipe flange supplied with the WAFS-1101 wafer-style flow meter.

Ensure the flange faces are aligned correctly and free from debris before installation.

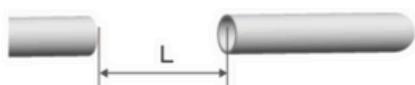
Apply proper torque in a diagonal cross pattern when tightening flange bolts to ensure even pressure and prevent leakage.

Flange-Type Installation (Model: WAFS-1102)

Use the matching flange connections provided with the WAFS-1102 model.

When welding flanges, protect the flow meter from excessive heat and spatter. Welding should be completed before installing the meter to avoid damaging the sensor.

After welding, clean and inspect the flanges, then mount the flow meter securely using appropriate gaskets and fasteners.



Step 01

Before installation, please confirm that the pipe reservation length L is consistent with the flow meter installation specifications.

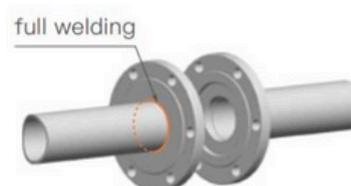


Pipe reservation length $L = A + 2B + 2C$
 A: Product Length B: Gaskets Thickness
 C: Flange Thickness



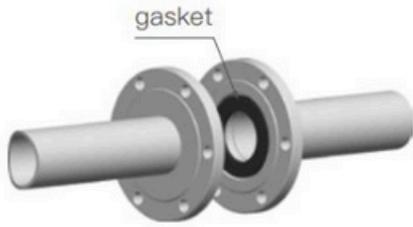
Step 02

Place the gaskets in the flange groove respectively, clamp the vortex flowmeter, and fix the flowmeter with bolts. Spot weld the flange at the cutout to make sure the flange is firmly installed.



Step 03

Remove flow meter and gasket, full welding Flange.



Step 04

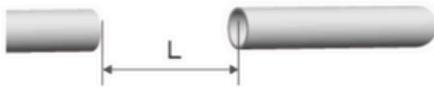
After the weld has cooled, insert a gasket on each side of the flange, noting that the gasket must be centered and not extend out of the pipe's inner wall.



Step 05

Installed into the flow meter (note the direction of the logo on the flowmeter, and the flowmeter body and the pipe must be aligned). Use bolts to fix the flowmeter. Installation complete.

Note: Flange-Style requires gaskets and pipe flanges supplied by the customer



Step 01

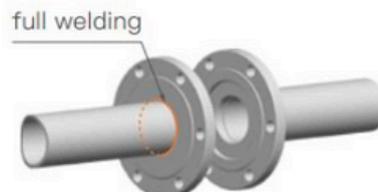
Before installation, please confirm that the pipe reservation length L is consistent with the flow meter installation specifications



Pipe reservation length $L = A + 2B + 2C$
A: Product Length B: Gaskets Thickness
C: Flange Thickness



Note: Alignment of flange hole position

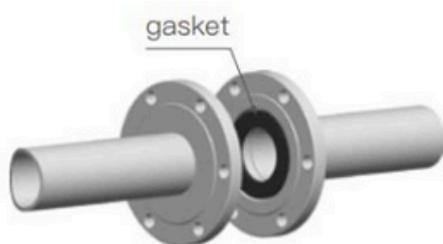


Step 02

Place the gaskets in the flange groove respectively, clamp the vortex flowmeter, and fix the flowmeter with bolts. Spot weld the flange at the cutout to make sure the flange is firmly installed.

Step 03

Remove flow meter and gasket, full welding Flange.



Step 04

After the weld has cooled, insert a gasket on each side of the flange, noting that the gasket must be centered and not extend out of the pipe's inner wall.

Step 05

Installed into the flow meter (note the direction of the logo on the flowmeter, and the flowmeter body and the pipe must be aligned). Use bolts to fix the flowmeter. Installation complete.

3.3 Electrical Connection

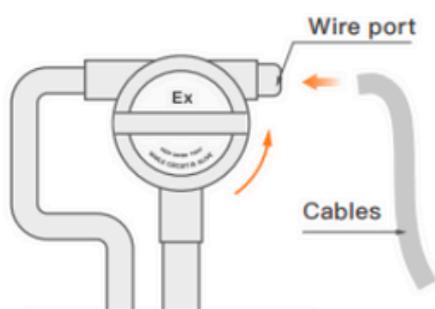


Figure 3-2 Schematic of Wire port

Unscrew the back cover anticlockwise to view the terminal block.

* The display direction can be rotated, please do not determine the front and back by the direction of the metal threaded pipe (the side with the LCD display is the front side).

Notice : If the installation scene requires rotation of display direction, please contact FixInst service team

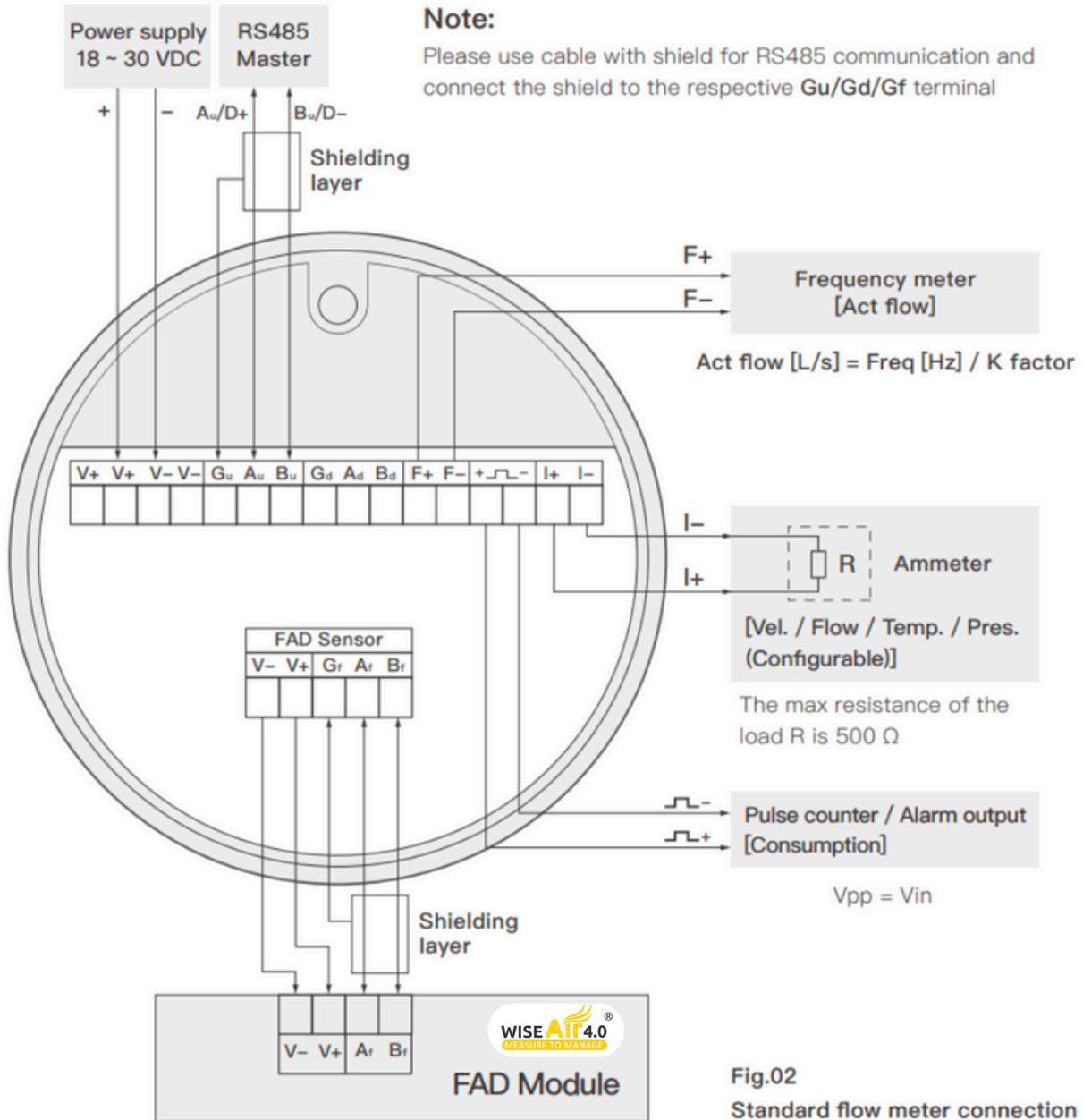


Fig.02
Standard flow meter connection

Figure 3-3 Standard flow meter connection

4. Setting

When the meter is powered on, it starts to operate automatically based on the memorized settings.

- Start-up screen



Figure 4-1 F231x-V Power-on Interface

- Display interface

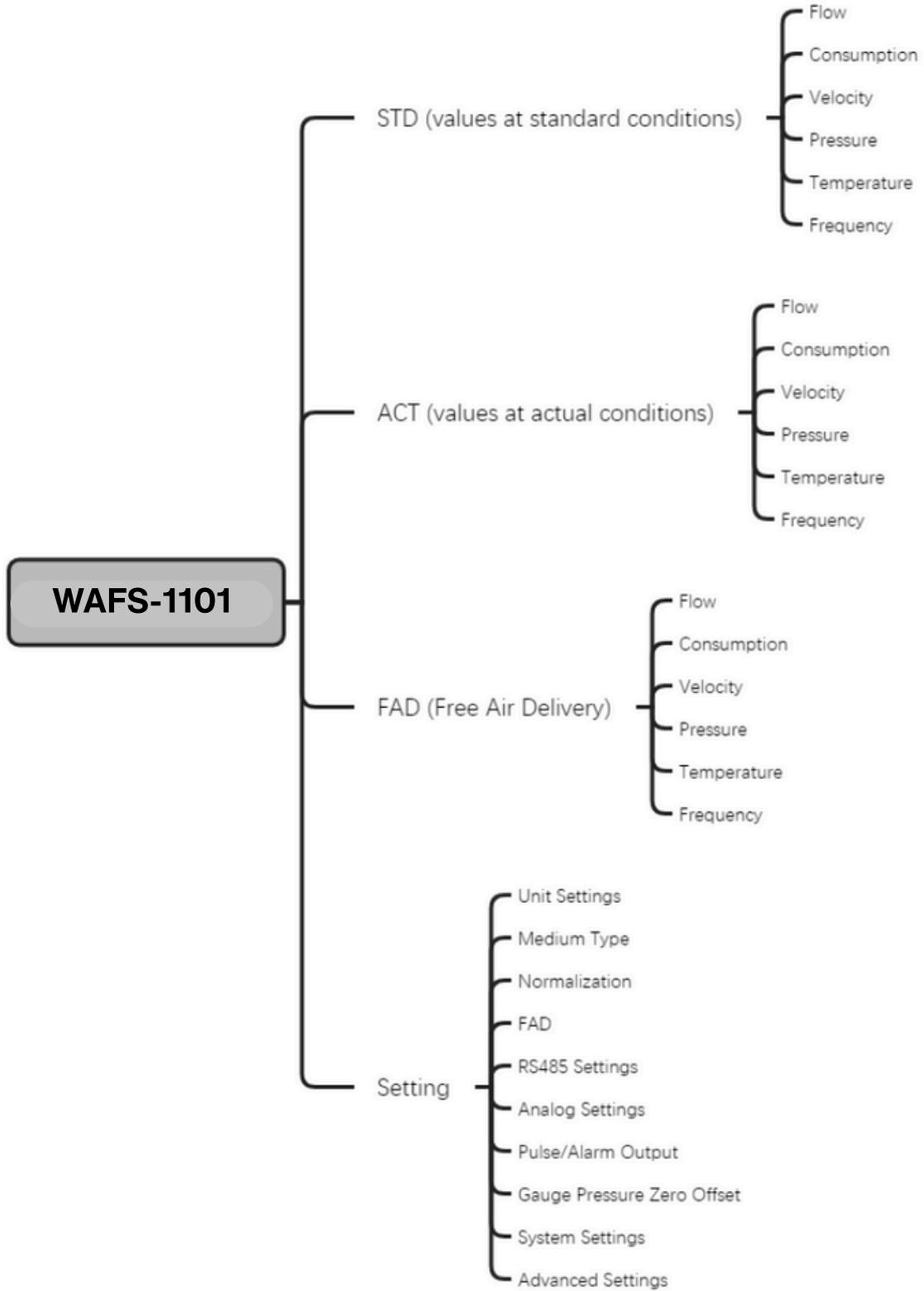
The default page of the display interface shows the flow values at standard conditions, which are standard instantaneous flow, standard consumption, standard instantaneous velocity, pressure, temperature and vortex frequency. By sliding the touch screen to the right, you can switch to show the flow values at actual conditions, which are actual instantaneous flow, actual instantaneous velocity and actual consumption.



Figure 4-2 F231x-V Main Interaction Interface

FixInst vortex flowmeter uses IPS touch screen and WYSIWYG (what you see is what you get) operation mode, which is simple and easy to understand. During operation, you can click the setting button at any time to enter the setting interface, and the setting data will take effect immediately. After the setting is completed, you can click the Home button in the upper right corner of the screen to return to the display interface, or wait for it to return automatically.

- Setting menu



5. Signal Output

Digital Output

Modbus RTU (RS485) communication is supported for direct integration with PLCs, SCADA, and other monitoring systems.

Refer to Chapter 6 for detailed communication protocol specifications.

Analog Output

The 4–20 mA output corresponds to the instantaneous flow rate.

4 mA = 0 Nm³/h

20 mA = Maximum rated flow of the specific model (as per Calibration Certificate).

Other parameters such as velocity, temperature, and pressure can also be assigned to the analog output.

Output scaling and limits can be adjusted via the local display, Service Kit, or RS485 interface.

Pulse Output

Outputs a pulse signal proportional to consumption.

Configurable: 1 m³ or 10 m³ per pulse (standard or actual conditions selectable).

Pulse amplitude = Input voltage amplitude.

Pulse width depends on flow rate (minimum width: 10 ms).

Frequency Output

Outputs the current vortex frequency signal, with amplitude equal to the input voltage amplitude.

Can be used for real-time calculation of instantaneous flow:

$$\text{Instantaneous Actual Flow (L/s)} = \frac{\text{Vortex Frequency (Hz)}}{\text{Instrument Factor K}}$$

6. Communication Protocols

6.1 Communication Parameters (Factory Defaults)

Device Address: 1

Baud Rate: 9600

Data Length: 8 bits

Parity: None

Stop Bit: 1

Response Timeout: 1 second

Response Delay: 0 ms

Frame Interval: 7 characters

6.2 Storage Register Definitions

Logical Channels: Accessible through data and holding registers.

Holding Register Access:

0x03 – Read Holding Registers

0x06 – Write Single Holding Register

0x10 – Write Multiple Holding Registers (sequential)

Coil Register Access:

0x05 – Write Single Coil

6.3 Process Data Format

The WAFS-1100 supports two data formats:

(a) IEEE 754 Floating-Point (for values with decimals)

Example:

Value: 123.4

Hex: 0x42F6CCCD

Storage (Register N, N+1):

High/Low = 0xCC 0xCD | 0x42 0xF6

(b) Unsigned Integer (for whole numbers)

Example:

Value: 123456789

Hex: 0x075BCD15

Storage (Register N, N+1):

High/Low = 0xCD 0x15 | 0x07 0x5B

6.4 Byte Order (Endianness)

Data is stored in little-endian format (least significant byte transmitted first).

32-bit: CD AB

64-bit: GH EF CD AB

6.5 Holding register: process data address table

Register Address	Data Type	Byte Length	Data	Unit	Read/Write	Applicable Flow Meter Model
0	FLOAT_L	4	nominal flow rate		R	F20x Pitot Tube Flow Meter F21x / F22x Thermal Mass Flow Meter F231x-V Vortex Flow Meter
2	FLOAT_L	4	nominal flow rate		R	F20x Pitot Tube Flow Meter F21x / F22x Thermal Mass Flow Meter F231x-V Vortex Flow Meter
4	DOUBLE_L	8	Cumulative nominal flow rate		R W: Write "0" to clear value	F20x Pitot Tube Flow Meter F21x / F22x Thermal Mass Flow Meter F231x-V Vortex Flow Meter
8	FLOAT_L	4	temperature		R	F20x Pitot Tube Flow Meter F21x / F22x Thermal Mass Flow Meter F231x-V Vortex Flow Meter
10	FLOAT_L	4	gauge pressure		R	F20x Pitot Tube Flow Meter F231x-V Vortex Flow Meter
12	FLOAT_L	4	working flow rate		R	F20x Pitot Tube Flow Meter F231x-V Vortex Flow Meter
14	FLOAT_L	4	working flow rate		R	F20x Pitot Tube Flow Meter F231x-V Vortex Flow Meter
16	DOUBLE_L	8	Cumulative working Flow rate		R W: Write "0" to clear value	F20x Pitot Tube Flow Meter F231x-V Vortex Flow Meter
20	FLOAT_L	4	Medium Density		R	F20x Pitot Tube Flow Meter F231x-V Vortex Flow Meter
22	UNSIGNED LONG	4	Cumulative nominal flow (4 bytes)		R W: Write "0" to clear value	F20x Pitot Tube Flow Meter F21x / F22x Thermal Mass Flow Meter F231x-V Vortex Flow Meter

Register Address	Data Type	Byte Length	Data	Unit	Read/Write	Applicable Flow Meter Model
24	UNSIGNED LONG	4	Cumulative Conditional Flow Rate (4-Bit Byte)		R W: Write "0" to clear value	F20x Pitot Tube Flow Meter F231x-V Vortex Flow Meter
26	UNSIGNED INT	2	Gas Medium Types		R/W: 0: Air (default) 1: O ₂ 2: N ₂ 3: H ₂ 4: CO 5: CO ₂ 6: SF ₆ 7: Ar 8: He 9: N ₂ O 10: CH ₄ 11: C ₂ H ₆ 12: C ₃ H ₈ 13: C ₄ H ₁₀	F20x Pitot Tube Flow Meter F21x / F22x Thermal Mass Flow Meter F231x-V Vortex Flow Meter
27	UNSIGNED INT	2	Flow Unit		R/W: 0: m ³ /h (Nm ³ /h) 1: m ³ /min (Nm ³ /min) (default) 2: m ³ /s (Nm ³ /s) 3: l/min (NI/min) 4: l/s (NI/s) 5: cfm (Ncfm) 6: kg/h 7: kg/min 8: kg/s	F20x Pitot Tube Flow Meter F21x / F22x Thermal Mass Flow Meter F231x-V Vortex Flow Meter

Register Address	Data Type	Byte Length	Data	Unit	Read/Write
28	UNSIGNED INT	2	Flow Rate Unit		R/W: 0: m/s (Nm/s)(default) 1: ft/s(Nft/s)
29	UNSIGNED INT	2	Cumulative Flow Units		R/W: 0: m ³ (Nm ³) (default) 1: ft ³ (Nft ³) 2: kg
30	UNSIGNED INT	2	Temperature Unit		R/W: 0: °C (default) 1: °F
31	UNSIGNED INT	2	Pressure Unit		R/W: 0: Pa 1: hPa 2: kPa (default) 3: MPa 4: mbar 5: bar 6: psi
32	FLOAT_L	4	Pipe Inner Diameter	mm	R/W
34	FLOAT_L	4	Standard Temperature	°C	R/W: Default value 20 °C
36	FLOAT_L	4	Standard Pressure	kPa	R/W: Default value 100 kPa

Register Address	Data Type	Byte Length	Data	Unit	Read/Write
38	UNSIGNED INT	2	Filter Level		R/W: (Default value 5) F20x / F21x / F22x:1~255, F23X-V: 1 ~ 32
39	FLOAT_L	4	① Flow Factor		R/W: The flow factor cannot be set to a value less than 0. The default value 1.
41	FLOAT_L	4	Current atmospheric pressure	kPa	R/W: Default value 101.325 kPa For correction of gauge pressure
43	UNSIGNED INT	2	Automatic drainage		R/W: 0: close 1: turn on (default)
56	DOUBLE_L	8	Reverse cumulative nominal flow		R W: Write "0" to clear the accumulated flow
60	DOUBLE_L	8	Reverse cumulative condition flow		R W: Write "0" to clear the accumulated flow
64	UNSIGNED LONG	4	Reverse Cumulative nominal Flow (4-byte data type)		R W: Write "0" to clear the accumulated flow

Register Address	Data Type	Byte Length	Data	Unit	Read/Write
66	UNSIGNED LONG	4	Reverse Cumulative condition Flow (4-byte data type)		R W: Write "0" to clear the accumulated flow
70	FLOAT_L	4	Cutoff Flow Rate	m/s Nm/s	R/W: (Default value 0) The cut-off flow rate cannot be set to a negative value F23x-V: working flow rate F20x / F21x / F22x: nominal flow rate
72	FLOAT_L	4	② Vortex Instrumentation Coefficients	P/L	R/W
74	FLOAT_L	4	② Vortex Frequency	Hz	R
101	UNSIGNED INT	2	software version		R
102	UNSIGNED INT	2	hardware version		R
103	DOUBLE_L	8	Product Serial Number		R

Note:

① Flow factors are used to correct the flow indication:

Flow value = Flow measurement × Flow factor

e.g.: Flow measurement = 50 *Nm³/min*

Flow factor = 0.8

SO Flow value = 50 × 0.8 = 40 *Nm³/min*

② **Vortex Frequency Output/Meter Factor = Operating Flow Rate (L/s)**

An example write command is as follows:

Floating point number v=123.4 its corresponding hex 0x42F6 CCCD. write this value to device address 1, holding

register address 36 (pressure single point calibration offset)

Send Modbus commands: 01 10 0024 0002 04 CCCD 42F6 EE0D

01: Device Address

10: Function code 16 in hexadecimal

0024: Keep register address 36 in hexadecimal

0002: Number of holding registers to be written

04: Number of holding register bytes (0x42F6 CCCD total 4 bytes)

CCCD: Floating point low 16 bits

42F6: Floating point high 16 bits

EE0D: CRC

Device Response: 01 10 0024 0002 01C3

01: device address

10: Function code 16 in hexadecimal

0024: Keep register address 36 in hexadecimal

0002: Number of holding registers already written

01C3: CRC

6.6 Holding register: Address table for communication settings

Register Address	Data Type	Byte Length	Unit	Details	Default	Read/Write
50	UNSIGNED INT	2		Device Restart (write 1 to restart the device)		Write
51	UNSIGNED INT	2		device address (1...247)	1	Read/Write
52	UNSIGNED INT	2	bps	baud: 12 = 1200 bits/s 24 = 2400 bits/s 48 = 4800 bits/s 96 = 9600 bits/s 144 = 14400 bits/s 192 = 19200 bits/s 384 = 38400 bits/s 560 = 56000 bits/s 576 = 57600 bits/s 1152 = 115200 bits/s	96	Read/Write
53	UNSIGNED INT	2		parity bit 0 = none 1 = Odd Checksum 2 = Even checksum	0	Read/Write
54	UNSIGNED INT	2		stop bit 1: 1 bit 2: 2 bit	1	Read/Write
55	UNSIGNED INT	2	ms	Response timeout: 0...255 ms 1 ms/step Range of values: 0...255	0	Read/Write

Note:

These settings only take effect when a 1 is written to register 50, and then the Modbus master has to change its own communication settings to communicate with the slave.

6.7 Coil Register Address Table

Coil Address	Data Type	Byte Length	Unit	Details	Default	Read/Write
0	UNSIGNED INT	2		Restart Modbus communication Write: 0x0000 = no effect 0xff00 = Restart Read: always 0	0	Read/Write

7 Warranty Clause

The WAFS-108 Series flow meters are manufactured in strict compliance with applicable quality standards.

The manufacturer provides warranty of 3 years and support thereafter to ensure proper operation under normal usage conditions. The scope of after-sales service includes:

Remote technical support (telephone or online)

On-site technical support (where applicable)

Product repair

Product replacement (if repair is not feasible)

For assistance, please contact the manufacturer or authorized service representative.

⚠ Note: The warranty does not cover damage caused by misuse, improper installation, unauthorized disassembly, or operation beyond specified limits.

Understand Compressed Air System Dynamics with Our Advanced Measurement Solutions

Measure - Manage - Save - Sustain

Our Network



ASIA REGIONAL OFFICE

WISEAIR TECHNOLOGIES INDIA LLP

#12 Sri Venkatalakshmi Nagar,
Singanallur, Coimbatore - 641 005, India
Mob : +91 - 90477 78715
Email : info@wiseair.asia

CONTACT US

North America : info.usa@wiseair.eu
Europe : info@wiseair.eu
Middle East : info.uae@wiseair.eu
South Asia : info@wiseair.in
South East Asia : info@wiseair.asia



For More Info
SCAN HERE

follow us @ [wiseair.asia](https://www.wiseair.asia)

