



User Manual for WAFS - 103 Differential Pressure Pitot Tube Flow Meter

# Compressed Air Energy Saving Solutions

Smart Measurement Technology That You Can Trust



For More Info  
**SCAN HERE**

## 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



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## General Information

Please read this user manual in full and carefully observe the notes and instructions before and during installation, operation and maintenance. The manufacturer cannot be held liable for any damage which occurs as a result of non-observance or noncompliance with this user manual.

Should the device be tampered with in any manner other than a procedure which is described and specified in this manual, the warranty is cancelled and the manufacturer is exempt from liability. The device is designed exclusively for the described application.

This user manual should be read carefully by the technician / qualified personnel and the end user. Once you install, use or maintain this product, you accept that you have read, understood and complied with this manual. This manual should be kept with the Flow Meter and made available to relevant personnel as needed. WiseAir Endeavours to make changes to the content of this Manual, and tries to ensure Correctness and well stated, but is not responsible for Omissions or errors and the consequences caused thereby.

### ● Compressed Air Safety

- Any contact with quickly escaping air or bursting parts of the compressed air system can lead to serious injuries or even death.
- Do not exceed the maximum permitted pressure
- Only use pressure tight installation material.
- Avoid getting hit by escaping air or bursting parts.
- The system must be pressure-less during maintenance work.

### ● Installing the Flow Meter, Calibration & Maintenance

- The product must be installed properly and frequently calibrated, otherwise it may lead to the wrong measurement values, which can lead to wrong results.
- Always Observe the Direction of Flow When installing the Sensor. The
- Direction is Indicated on the Housing.
- Do Not Exceed the Maximum Operation Temperature at the Sensors Tip.
- Avoid Condensation on the Sensor Element as this will affect the accuracy enormously.
- Please observe national regulations before/during installation and operation.
- Do not disassemble the product.
- Always use a spanner to mount the product properly

### ● Electrical Safety

- Any contact with energized parts of the product, may lead to an electrical shock which can lead to serious injuries or even death. Consider all regulations for electrical installations.
- The system must be disconnected from any power supply during maintenance work.
- Any electrical work on the system is only allowed by authorised qualified personal.

### ● Using the Flow Meter

- Do not use this product in explosive areas.
- Do not exceed the permitted operating parameters.
- Any operation exceeding these parameters can lead to malfunctions and may lead to damage on the instrument or the system.
- Do not exceed or go below the permitted storage and operation temperature and pressure.
- This product should be maintained and calibrated frequently, at least every 2 years.

### ● Storage and Transportation

- Make sure that the transportation temperature of the sensor is between -10°C to 60 °C.
- Storage temperature of the sensor is between -10 °C to 50 °C and the humidity is <90%, no condensation.
- Avoid direct UV and solar radiation during storage.

## About WAFS -103 Differential Pressure Pitot Tube Flow Meter

### ● Importance of Flow Meters :

Flow meters are very popular for measuring compressed air systems. Depending on where they are installed, flow meters can tell you the compressor output, system consumption, peaks and troughs as well as average usage. When used well, flow monitoring can help keep your system under control and highlight any unusual activity in your system.

Different types of flow meters should be used depending on the specific location and purpose. However, when it comes to compressed air, flow meters such as vortex or orifice plates can create a pressure drop within the system, ultimately leading to increased operating cost of the entire plant. As such, vortex or orifice plate flow meters are not recommended for compressed air.

### ● Differential Pressure Pitot Tube Flow Meters

- Pitot tube flow meters are ideally suited to wet, dirty and high velocity gases. The extremely sensitive differential pressure measurement allows this sensor to be used over a wide flow range. The patented anti condensation technology enables the sensor to be used under saturated conditions and ensures the sensor will perform stable accurate measurements for years to come.
- Pitot tube flow sensor measures the upstream dynamic pressure and downstream static pressure. The pressure differential is a measure of the velocity and flow rate.
- Thanks to the online auto-calibration technology, high reliability, long-term measurement and accuracy can be guaranteed.
- Pitot flow meters are widely used in industrial processes, chemical, petrochemical, power engineering, etc.
- Pitot Tube flow meters are ideal for both temporary or permanent installations.

### ● Benefits

- Improves system efficiency
- Reduces system maintenance
- Reduces operating and energy costs
- Increases system understanding and operation
- Identifies changes in system performance
- Identifies non-productive air demand and leakage
- Identifies peak and average demand

### ● Key Features of Pitot Tube Flow Meters

- Insertion type sensor
- Ideal for wet and dirty gases Flow range of 5-300 Nm/s  
Note : below minimum velocity flow meter reading will be zero
- Patented anti condensation technology
- Integrated pressure and temperature sensor
- Online auto-calibration function to compensate for temperature and pressure change
- Easy to insert and remove through 1/2" valve, even when under pressure
- Two output types as standard : Digital - Modbus RTU and Analog - 4...20 mA + Pulse
- Two shaft length options : 250 mm or 400 mm
- Suitable for pipes from DN25-DN300 provided minimum velocity (>1L/minute) is maintained
- Vibration proof
- Low pressure drop
- 2.8" ultra-wide viewing angle LCD touch screen
- Data logging with up to 10,000,000 recording points



## What's in the Box ?

- Each WAFS - 103 Flow Meter Unit comes with :



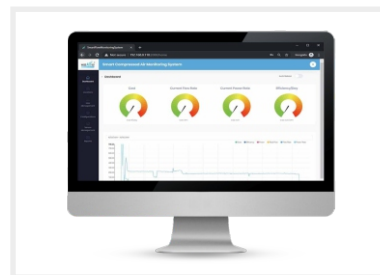
1. WAFS - 103 Flow Meter
2. Power Adapter
3. User Manual
4. Connection Spanner
5. Calibration Certificate
6. 2x5 Pin M12 Connector with 2 meter cable
7. Stainless Steel Nipple
8. Stainless Steel ½" Ball Valve

## Optional Accessories

- The following accessories are available for WAFS - 103 Flow Meter. Talk to your local dealer for pricing and other accessories.



Y-type M12 connector for connecting multiple sensors simultaneously via RS485



Smart Data Acquisition and Monitoring Software

## Product Specification

Technology	Patented Anti Condensation
Process Medium	Air, Argon, Carbon Dioxide, Helium, Hydrogen, Natural Gas, Nitrogen, Nitrous Oxide, Oxygen
Applications	Wet and Dry Air, High Velocities
Accuracy	Flow : $\pm(1\% \text{ reading} + 0.3\% \text{ full scale})$ ; Pressure : $\pm 0.5\% \text{ Full Scale}$ ; Temperature : $\pm 0.5^\circ \text{ C}$
<b>Measuring Ranges</b>	
Flow	5 ... 300 Nm/s.
Pressure	0 to 16 Bar
Temperature	$-40^\circ \text{ C}$ to $+200^\circ \text{ C}$ / $-40^\circ \text{ C}$ to $+392^\circ \text{ C}$
<b>Outputs</b>	
Signals	Analog (4..20mA (4Wire, Isolated)/Pulse Output; Digital : RS485 Modbus/RTU
Parameters	Flow, Consumption, Pressure, Temperature and Velocity
<b>Power Supply</b>	
Input	18 to 30V / 6.5W@24V
Anti Condensate	18 to 30V/ 24W@24V
Power Up EMC	According to IEC 61326-1
<b>Display &amp; Data Logging</b>	
Display	2.8" LCD With Touch Panel
Data Logger	10,000,000 Samples
<b>Other Informations</b>	
Pipe Sizes	DN 25 to DN 300
Shaft Length	250 mm & 400 mm
Electrical Connection	2 x 5 pin, M12, Female
Process Connection	ISO G1/2" Thread
Ambient Temperature	$-20^\circ \text{ C}$ to $+60^\circ \text{ C}$

## Flow Range

Pipe Size			Flow Range (Nm <sup>3</sup> /h)		Flow Range (cfm)	
Inches	DN	ID(mm)	Min Flow	Max Flow	Min Flow	Max Flow
1	25	25	8.8	530	5.17	311.9
1 ¼	32	32	14.5	868	8.53	510.81
1 ½	40	40	22.6	1357	13.3	798.59
2	50	50	35.3	2120	20.77	1247.62
2 ½	65	65	59.7	3583	35.13	2108.59
3	80	80	90.5	5428	53.25	3194.37
4	100	100	141.4	8482	86.21	4991.65
5	125	125	220.9	13253	129.99	7799.39
6	150	150	318.1	19085	187.2	11231.52
8	200	200	565.5	33929	332.79	19967.22
10	250	250	883.6	53014	519.99	31198.74
12	300	300	1272.3	76340	748.74	44926.09

## Installation - Mechanical

Before installing the sensor, make sure it is rated for your system (refer to the “Specifications” section above). We suggest purging the pipeline before installation to prevent impurities from damaging the flow meter or blocking the pressure pipe.

### WARNING!

- Incorrect installation can damage the sensor or cause it to work incorrectly.
- You need to maintain a minimum flow velocity of 5 Nm/S for the pitot tube to work correctly. Below this minimum velocity, the flow meter reading will be zero.

### Step 1 - Find a Suitable Section of Horizontal Pipe:

The Sensor Must be Installed :

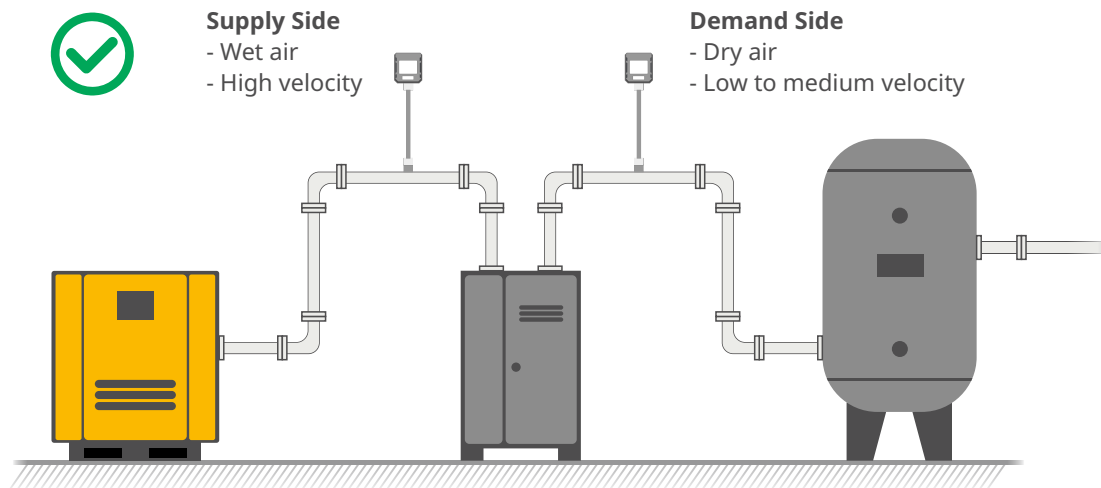
- on a horizontal pipe
- upright, at  $90^\circ (\pm 15^\circ)$  to the pipe (ie vertically),
- away from bends, edges, seams, changes in pipe size and other obstructions (see Step 2 below)
- after the first filter or water separator (ie the sensor can not be installed directly on the outlet of the compressor)

Make sure the insertion location has enough room above the pipe to install the sensor. If installing the sensor outdoor, protection from sun and rain is necessary.

### Install Vertically To Pipe

- The sensor must be installed upright, at  $90^\circ \pm 15^\circ$  (ie within  $75^\circ$  to  $105^\circ$  of vertical). Installing the sensor at an angle can result in water accumulating in the shaft or head of the sensor. This can damage the sensor and void the warranty.

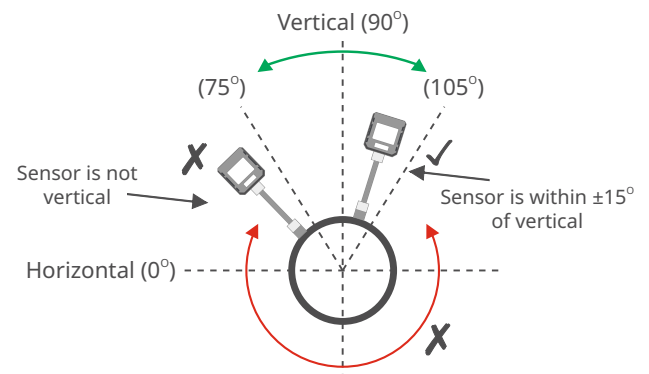
### Correct Installation



### Installing the Pitot Tube Flow Meter on the Compressor Outlet

- **Non-Condensing gases** - The pitot tube can be installed on the outlet of compressors
- **Condensing gases** - The pitot tube can not be installed directly on the outlet of compressors.

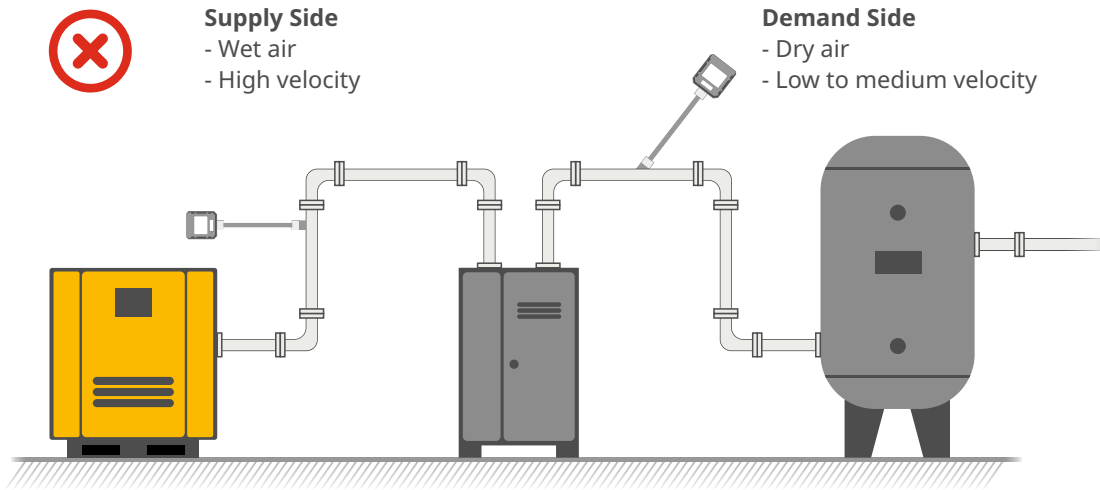
If you want to install the pitot tube near the outlet of a compressor, a water separator or filter is required to reduce the condensed liquid in the gas.





**Incorrect Installation**

- Do NOT install the sensor on a vertical pipe, upside down or at an angle, as shown below.
- Do NOT let water get into the shaft or head of the sensor as this can damage the sensor or result in incorrect readings.



**Step 2 - Choose Insertion location away from obstacles**

- To achieve and maintain the accuracy stated in the technical data, the sensor must be inserted vertically, on a straight horizontal pipe section away from bends, edges, seams, curve, changes in pipe size, control valves, etc. The sensor cannot be installed directly on the outlet of the compressor.
- For best results, choose a long, absolutely straight, horizontal section of pipe that is free of obstructions. Pipe obstructions (eg bends, edges, seams, curve, changes in pipe size, control valves, etc) change the velocity of compressed air / asses and/or create turbulence near the obstruction. Placing the sensor too close to the obstruction will result in inaccurate readings.
- Make sure that the insertion location has enough straight pipe on either side of the sensor, as shown in the diagram on the next page.

**WARNING!**

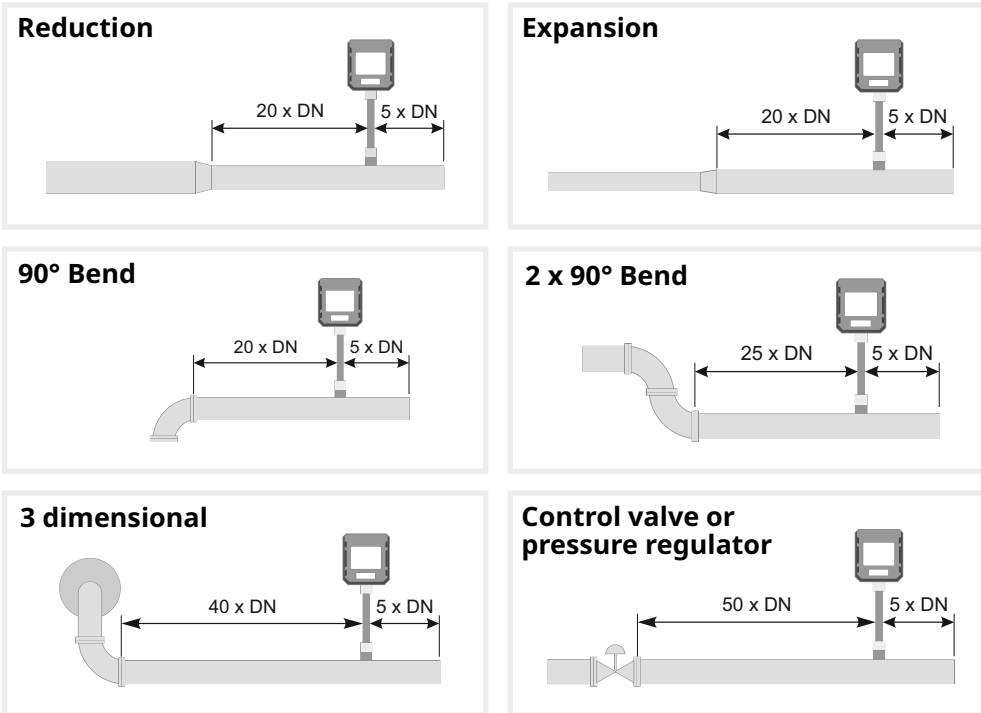
Inaccurate measurement may occur if the sensor is installed incorrectly

- Pay careful attention to the distance between the sensor's inlet and outlet sections and points of turbulence (eg bends, valves, etc)
- Obstructions can cause counter-flow turbulence as well as turbulence in the direction of the flow.
- The sensor is for indoor use only. If installed in an outdoor installation, the sensor must be protected from sun and rain.

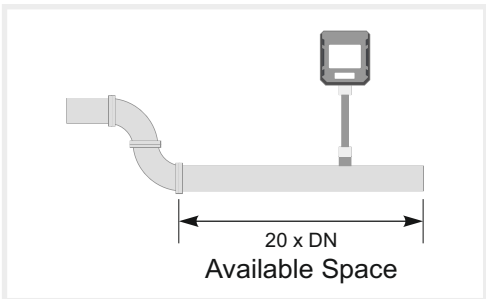
The figure below shows the minimum distances (in multiples of pipe diameters (DNs)) that the sensor must be installed away from bends, changes in pipe size and other obstructions.

- The inlet side of the sensor must be at least 20 to 50 times the pipe diameter way from the obstruction (depending on the type of obstruction — see figure below).
- The outlet side of the sensor must be at least 5 times the pipe diameter away from the obstruction.

● **Correct Installation**

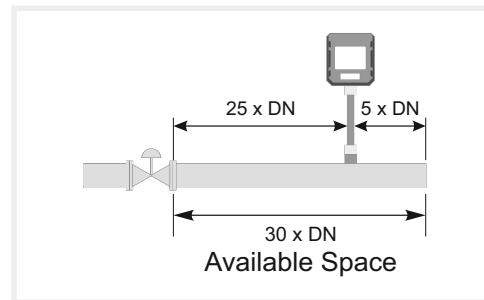


● **Incorrect Installation**



Need at least 30 DN (25 DN on the inlet side + 5 DN on the outlet side see picture 4 above) but only 20 DN is available

Need at least 50 DN on the inlet side (see picture 6 above) but only 25 DN is available



## ● Examples

### ● Example 1 - Installation near a bend

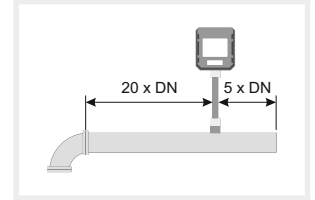
A flow sensor will be installed on a section of pipe, just after a bend (as shown in the diagram on the right). The pipe has a DN of 50 (ie, it's a 2 inch or 50 mm pipe).

Using the reference diagrams on page 10, the sensor installation is similar to diagram 3 (90° Bend or T- piece). Therefore, the sensor must be installed:

- On a straight section of pipe
- The Inlet side of the sensor must be at least 20 x DN away from the bend.
- The outlet side of the sensor must be at least 5 x DN away from any other obstruction.

For pipe with DN 50 (2" or 50 mm pipe), the sensor must be installed:

- Inlet side:  $20 \times 2" = 40"$  (imperial) or  $20 \times 50\text{mm} = 1,000\text{mm} = 1 \text{ meter}$  (metric) away from the bend.
- Outlet side:  $5 \times 2" = 10"$  (imperial) or  $5 \times 50\text{mm} = 250\text{mm}$  (metric) from any other obstruction



### ● Example 2 - Installation near a S bend and a Control Valve

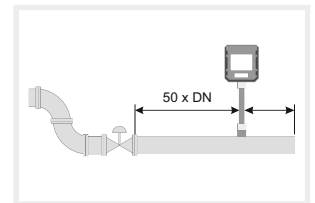
A flow sensor will be installed on a section of pipe, just after a S-bend and a control valve (as shown in the diagram on the right). The pipe has a DN of 50 (ie, it's a 2 inch or 50 mm pipe).

Using the reference diagrams on page 10, the sensor installation is combination of diagram 4 (2 x 90° Bend ) and diagram 6 (Control Valve). Since the sensor is adjacent to the control valve, we will use those dimension. The sensor must be installed:

- On a straight section of pipe
- The Inlet side of the sensor must be at least 20 x DN away from the bend.
- The outlet side of the sensor must be at least 5 x DN away from any other obstruction.

For pipe with DN 50 (2" or 50 mm pipe), the sensor must be installed:

- Inlet side:  $50 \times 2" = 100"$  (imperial) or  $50 \times 50\text{mm} = 2,500\text{mm} = 2.5 \text{ meter}$  (metric) away from the bend.
- Outlet side:  $5 \times 2" = 10"$  (imperial) or  $5 \times 50\text{mm} = 250\text{mm}$  (metric) from any other obstruction



### ● Example 3 - Installation between a bend and an expansion

A flow sensor will be installed on a section of pipe between a bend and an expansion joint (as shown in the diagram on the right). This section of pipe is 1 meter long. The pipe has a DN of 50 (ie, it's a 2 inch or 50 mm pipe) and is being expanded to an 80 DN pipe (ie a 3" pipe).

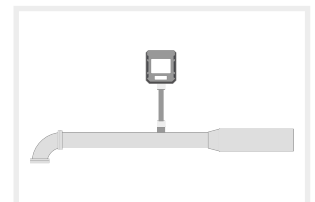
Using the reference diagrams on page 10, the sensor installation is similar to diagram 3. Therefore, the sensor must be installed:

- On a straight section of pipe
- The Inlet side of the sensor must be at least 20 x DN away from the bend.
- The outlet side of the sensor must be at least 5 x DN away from the expansion joint.

For pipe with DN 50 (2" or 50 mm pipe), the sensor must be installed:

- Inlet side:  $20 \times 2" = 40"$  (imperial) or  $20 \times 50\text{mm} = 1,000\text{mm} = 1 \text{ meter}$  (metric) away from the bend.
- Outlet side:  $5 \times 2" = 10"$  (imperial) or  $5 \times 50\text{mm} = 250\text{mm}$  (metric) from any other obstruction.

Therefore, the total length of pipe needs to be at least 50" long (40" on the inlet side + 10" on the outlet side) or 1.25m long (1 meter on the inlet side + 0.25 meters of the outlet side).

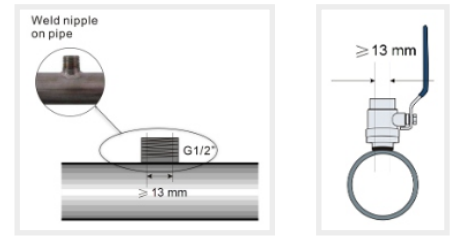


Since the pipe is only 1 meter long, and you need at least 1.25m of pipe to install the sensor, you **cannot** install the sensor at this location. If you do, you may end up with inaccurate data.

**Step 3 - Fixing the Ball Valve on the Pipe:**

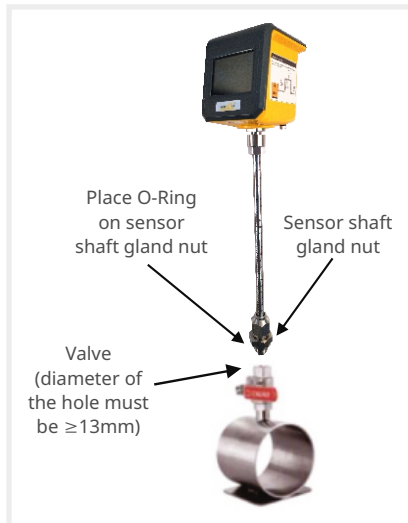
To install the sensor, you need a ball valve or a nozzle with the following specifications:

- The inner thread must be G 1/2"
- The diameter of the hole must be > 13mm, otherwise the shaft can not be inserted into the pipe.



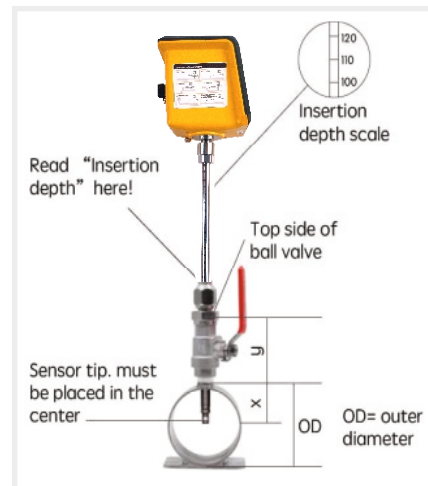
**Step 4 - Insert Sensor and Align Tip With the Centre of the Pipe**

- Place O-Ring on sensor shaft gland nut.
- Screw the sensor into the valve, then open the valve.



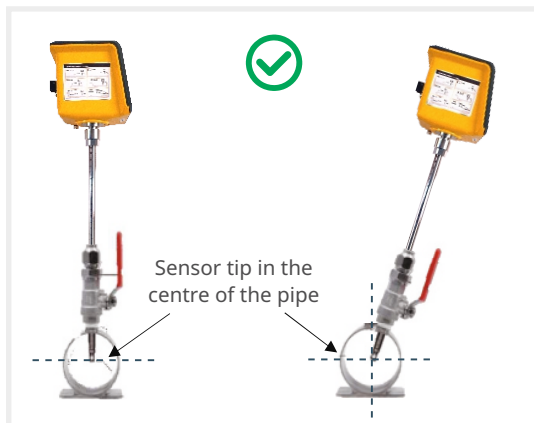
**Step 5 - Insert Sensor and Align Tip With the Centre of the Pipe**

- Use the depth scale on the sensor shaft to place the tip of the sensor in the middle of the pipe.
- Once the tip is in the centre of the pipe, tighten the gland nut to hold the sensor in place.
- The Insertion Depth =  $x + y = \frac{OD}{2} + y$ 
  - OD = outer diameter of pipe
  - Y = ball valve height.



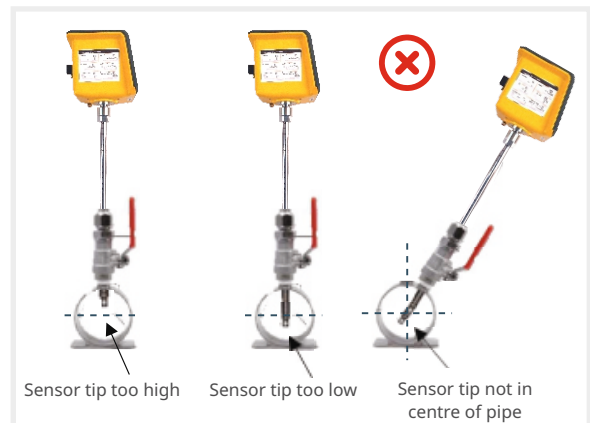
**Correct Installation**

The sensor tip must be in the center of the pipe / tube.



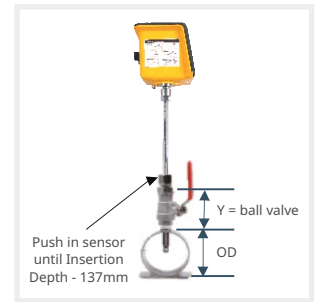
**Incorrect Installation**

Note : Inaccurate measurement may occur if the sensor is installed incorrectly.



**● Example - Finding Centre of the Pipe / Tube**

- The sensor is being installed in a cooper tube with a ON of 100. This equates to an outer diameter (OD) of 100mm. The ball valve is 87mm high.
- The Insertion Depth =  $(OD/2) + y$  where y = height of the ball valve.
- Therefore, the Insertion Depth =  $100mm / 2 + 87mm = 137mm$ .
- Push the sensor shaft into the cooper tube until the "Insertion Depth"



**● Step 6 - Align the Sensor With Direction of Flow**

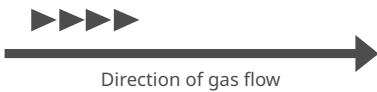
- The flow meter is not bidirectional. When installing and using the flow meter, please pay attention to the direction of air flow and the alignment of the sensor.
- The direction is flow is marked by 4 gray arrows on the back of the sensor and underneath the sensor.

**● Correct Installation**

The Sensor is aligned in the same direction as the gas flow.



Sensor alignment



**● Incorrect Installation**

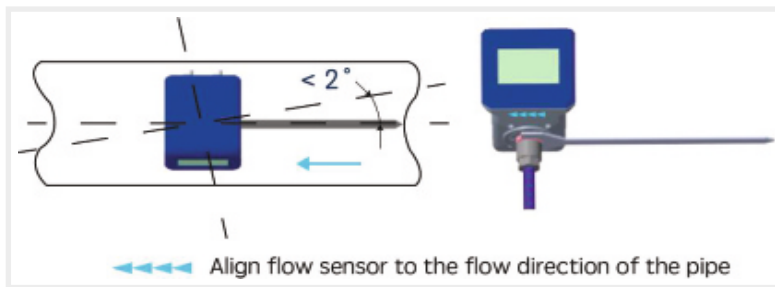
Note : Inaccurate measurement may occur if the sensor is installed incorrectly.



Sensor alignment



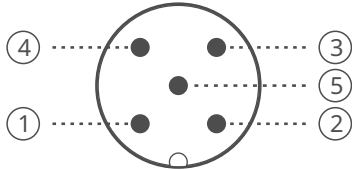
- Use the alignment tool to align the sensor with the pipe. Ensure the arrows on the sensor match the direction of flow.



## Installation - Electrical (Wiring)

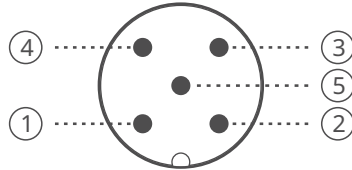
- The flow sensor is equipped with two M12 connector plugs - "A" and "B". Cables are connected to the sensor through the M12 connector plugs.
- Do not screw the M12 connector using force. Otherwise, it may damage the connection pins.

### Connector A (Modbus)



Pin 1\_ Modbus RTU Data +  
Pin 2\_ Modbus RTU Data -  
Pin 3\_ Not Used  
Pin 4\_ +18~30v DC  
Pin 5\_ 0v DC

### Connector B (Analogue)



Pin 1\_ 4~20mA +  
Pin 2\_ 4~20mA -  
Pin 3\_ Pulse  
Pin 4\_ Pulse  
Pin 5\_ Not Used



## Configuring Settings

### Interface



### Unlock the screen

- The screen is set to automatically lock after 60 seconds. If the lock screen symbol is present, press the symbol, hold and drag it to the right of the screen.
- You can change the timing for the lock screen in the "Screen Settings" menu (Settings > System Settings > Screen Setting)

### Home Screen

Scroll left or right to other screens

- The home screen has three pages, as shown by the three dots (...) at the bottom of the screen. Move the screen left or right to move between screens.

### The flow meter has a touch screen interface.

- Menu options
- Settings
- Data
- Locked screen icon

### To navigate the interface:

- Scroll up and down to see other options
- Scroll left and right to see other screens
- Press an item to access that feature

### Menu Options

When you press the Menu icon a pop up screen appears.

#### Press:

- The Home icon () to return to the home screen
- The Camera icon () to take a screen shot of that screen
- The Notepad icon () to access the Data Logging information

If you have a micro USB installed, press the USB icon to safely remove the USB.



MENU	SUB MENU 1	SUB MENU 2	SUB MENU 3
Home	Nor Flow, Nor Velocity, Nor Consumption, Flow, Temperature, Pressure		
Settings	Pipe Diameter		
	Unit Setting	Flow unit	M <sup>3</sup> /h, M <sup>3</sup> /min, M <sup>3</sup> /s, I/min, I/s, CFM ,Kg/h, Kg/min, Kg/sn
		Velocity unit	M/s, ft/s
		Consumption unit	M/s, ft <sup>3</sup> , Kg
		Pressure unit	Pa, hPa, kPa, mPa, mbar, bar, PSI
		Temperature unit	°C, °F
	Gas Type	Air, Oxygen, Nitrogen, Hydrogen, Carbon Mono., Carbon Dio., Sulfur Hexa, Argon, Helium, Methane Nitrus Oxide, Ethane, Propane, Butane, Biogas, Natural Gas	
	Logging	Logging, History	
	ScreenShot		
	Normalization	Flow unit Prefix	
	RS 485 Setting	Baud Rate	1200, 2400, 4800, 9600, 14400, 19200, 38400, 56000, 57600, 115200
		Parity	None, Odd, Even
		Stop Bits	1, 2
		Response Delay	
		Device Address	
	Analog Setting	4-20 MA Channel	Flow, Velocity, Pressure, Temperature, Nor Flow, Nor Velocity
		4-20 MA Scaling Low	
		4-20 MA Scaling High	
		Pulse Output	
		Cubic meter/pulse	
	System Setting	Screen Setting	Rotation, Brightness, Screen Timeout
		System Information	
		System Update	
Advanced Setting	Velocity Offset Ratio		
	Velocity Filter Grad.		
	Consumption	Act - Consumption, Nor - Consumption	
	Anti Condensation		
	Constant Temperature		
	Pressure Calibration		
	Cutoff Velocity		
	New Password		
	Password Reset		
		Password <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	

## ● Unit Measurement

- To change the Unit of Measurements, goto Settings (⚙️) > Unit Setting
- You can change the units of measurement for **To change the units of measurement:**
- Select the desired unit of measure
- Press the arrow (⬅️) to save your setting and return to the previous screen.

### Measure Units

- **Flow:** Nm<sup>3</sup>/h, Nm<sup>3</sup>/min, Nm<sup>3</sup>/s NI/min, NI/s, Ncfm Kg/h, Kg/min, Kg/s
- **Velocity:** Nm/s, Nft/s
- **Consumption:** m<sup>3</sup>, ft<sup>3</sup>, kg
- **Pressure:** Pa, hPa, kPa, Mpa mbar, Bar. PSI
- **Temperature:** °C, °F

## ● Gas type

- To change the Gas type, go to Settings (⚙️) > Gas Type.
- To change the gas type:
- Select the desired gas type (You might need to scroll up or down to see all options)
- Press the arrow (⬅️) to save your setting and return to the previous screen.
- The flow meter is calibrated in air. If you select another gas type, the flow meter will automatically adjust its readings to match the gas selected.
- You can select from the following gas types :
  - **Air, Argon (Ar), Butane (C4C10), Carbon Dioxide (CO<sub>2</sub>), Carbon Monoxide (CO), Ethane (C<sub>2</sub>H<sub>6</sub>), Helium (He), Hydrogen (H<sub>2</sub>), Methane (CH<sub>4</sub>), Nitrogen (N<sub>2</sub>), Nitrous oxide (N<sub>2</sub>O), Oxygen (O<sub>2</sub>), Propane (C<sub>3</sub>H<sub>8</sub>), Sulfur Hexafluoride (SF<sub>6</sub>).**

## Communication Settings

### ● RS485 Setting

- To change the Modbus Setting, goto Settings (⚙️) > RS485 Setting Here you can set / change the :
  - **Baud Rate, Parity, Stop Bits, Response Delay, Device Address** (Scroll up or down to see all options.)
- To Change the RS485 Settings : Press the setting you want to change (Select the desired setting.)
- You might need to scroll up or down to see all options
- Press the arrow (⬅️) to save setting and return to the previous screen
- Default Modbus setting are :
  - **Baud Rate : 9600, Parity : None, Stop Bits : 1, Response Delay : 0, Device Address : 1**

For more Modbus setting, refer to the next page.

### ● Analog Output

- To change the Analog (4-20mA) setting, go to Settings (⚙️) > Analog output Here you can set / change :
- Which measurement is transmitted via the analog channel
  - Only one measurement can be transmitted via the analog setting
- The Scaling
- The pulse out mode
  - Choose from Actual Consumption or Normalized Consumption
- Cubic meter / pulse
- **To change the 4-20mA Channel :**
  - Press 4-20mA channel
  - Select Flow, Velocity, Pressure or Temperature
  - Press the arrow (⬅️) to save settings and return to the previous screen
- **To change the Cubic meter / Pulse (consumption) :**
  - Press Cubic Meter / Pulse
  - Set number of cubic meters per pulse
  - Press the arrow (⬅️) to save setting and return to the previous screen

### ● Default Modbus Settings

Settings can be changed to suit system requirement

Modbus Register					
Holding Register Address	Data Type	Byte Length	Description	Unit	Read / Write
0	Float	4	Flow	m <sup>3</sup> /min, m <sup>3</sup> /hr, CFM	Read
2	Float	4	Velocity	m/sec or f/sec	Read
8	Float	4	Temperature	°C, °F	Read
10	Float	4	Pressure	Pa, bar, PSI	Read
24	Unsigned Integer	4	Consumption / Totaliser	m <sup>3</sup> or CF	Read
41	Float	4	Atmosphere Pressure	kPa	Read / Write

Default Modbus RTU (RS 485) Settings					
Address	Baud Rate	Frame / Parity / Stop Bit	Response Time	Response Delay	Frame Spacing
0	9600	8 / N / 1	1 Sec	0 ms	7 Character

Communication Configuration					
Holding Register	Address	Byte Length	Description	Default	Read / Write
51	50	2	Restart Device (write 1 to restart device)		Write
52	51	2	Device Address (1 ~ 247)	1	Read / Write
53	52	2	Baud Rate 12 - 1200 bps 24 - 2400 bps 48 - 4800 bps 96 - 9600 bps 144 - 14400 bps 192 - 19200 bps 384 - 38400 bps 560 - 56000 bps 576 - 57600 bps 1152 - 115200 bps	9600	Read / Write
54	53	2	Parity 0 - None 1 - Odd 2 - Even	0	Read / Write
55	54	2	Stop Bit 1 - 1 bit 2 - 2 bit	1	Read / Write
56	55	2	Response Time Out 0 ~ 255 ms; 1 ms/ step; Value range : 0 ~ 255	0	Read / Write

## ● Data Logging



You can set up data logging, view data logging history and start or stop data logging via the "logging" menu.

You can access the data logging menu via :

- Notebook icon (📓) on the top left of the screen, or via the setting menu (⚙️) on the top right of the screen (Setting > Logging).

### Setup Data Logging

- To setup data logging :
  - Enter a Descriptive Name for the data.
  - Enter the sample rate, in seconds
  - Turn on / off "Wrap Around"
    - if you turn on "Wrap Around" the data will write over old records when the memory card is full
    - if you turn of "Wrap Around", the data will stop recording when the memory card is full
  - Select which channels you want to log, you can select one or more from the list below :
    - Flow, Velocity, Consumption, Temperature, Pressure, Normalized Flow, Normalized Velocity, Normalized Consumption, Density
  - Enter the system date and time
  - If you want the data logging to start at a specific time, enter the START date and time
  - If you want the data logging to stop at a specific time, enter the STOP date and time
  - Press the arrow (↩️) to save setting and return to the previous screen

### ● Start / Stop Logging

- Press the Notebook icon (📓) on the top left of the screen
- To start data logging (without changing any of the settings) press Start Icon
- To stop data logging (without changing any of the settings), press the Stop icon
- When data logging is active, the pencil on the notebook icon (📓) will move.

### ● Download Data :

- To download data
- Press the history option
- Select the data to download
- Insert a micro USB into the back of the flow sensor
- Press Export
- Press the arrow (↩️) to save settings and return to the previous screen. The Data will download as a CSV file.

### ● Delete Data :

- To delete historical data records
- Press the History option
- Select the data to delete
- Press Delete
- Press the arrow (↩️) to save settings and return to the previous screen

## System Settings

### System Settings

Under System Settings, you can:

#### Change Screen Settings:

- Screen rotation
- Screen brightness
- Timing for screen lock

#### Change the Language

- Danish
- English

#### View system information

- Update the Flow Meter's firmware

To access the screen shots, go to the Settings Menu (⚙️) > System Setting.

### System Settings > Screen Settings

- Rotate the screen 90 degrees
  - To rotate the screen 90 degrees, press the rotate button.
  - Keep pressing to rotate to 180 degrees, 270 degrees and 360 degrees.
- Change Screen Brightness
  - To change the screen brightness, drag the bar left or right



#### Change Screen Timeout

- The screen is set to automatically lock after 60 seconds.
  - To change the timing, move the dial up or down.
  - You can set the screen to never lock.
  - Press the arrow (↩️) to save settings and return to the previous screen.

### System setting > Language Settings

- To access the language settings, goto the Settings. Menu (⚙️) > System Setting > Language Setting
  - To change the language :
    - Select the desired language
    - Press the arrow (↩️) to save the settings and return to previous screen.

### System setting > System Information

- This screen displays information about the sensor and its firmware.
  - Serial Number = Short serial number of the unit. The full serial number is on the label on the top sensor
  - Hardware Version and software Version for both the sensor technology and the display unit
  - Press the arrow (↩️) to save the settings and return to previous screen.

### System setting > System Update

- Firmware updates are generally not required.
- If a new version of the firmware is released, your local dealer will send the software to you on a micro USB.
  - **To update the firmware :**
    - Plug the micro USB into the back of the sensor.
    - On the flow Sensor's Touch Screen, go to the Settings Menu (⚙️) > System Setting > System Update
    - Follow the prompts

### Screen Shot

- You can take a screen shot of any screen by pressing the camera icon (📷) on the top left of the screen.
- To access the screen shots, go to the Settings Menu (⚙️) > Screen Shots.

Here you can:

- View the picture
- Export the picture to a micro USB
- Delete pictures

### View a picture

- Press the picture name to view the picture.

### Export y Download Pictures

- To export pictures:
  - Insert a Micro USB into the back of the flow sensor
  - Press the Option icon
  - Select the images you want to download
  - Press the Export icon.

### ● Delete Pictures

- To delete pictures:
  - Press the Option icon
  - Select the images you want to delete
  - Press the Delete icon



## Warranty

WiseAir Technologies provides a 12-month warranty for all Flow Meters. The warranty covers material and workmanship under the stated operating conditions from the date of delivery. Please report any issues immediately and within the warranty time.

If faults occur during the warranty period WiseAir Technologies will repair or replace the defective unit, without charge for repair labor and material costs but there is a charge for other services such as labor to remove or reinstall the instrument, transport and Warranty repairs do not extend the period warranty.

**The following damage is excluded from this warranty:**

- Improper use and non-adherence to the user manual.
- Use of unsuitable accessories. External influences (e.g. damage caused by vibration, damage during transportation, excess heat or moisture).

**The warranty is cancelled when one of the following situations occurs:**

- The user opens the measurement instrument without a direct request written in this manual. Repairs or modifications are undertaken by third parties or unauthorized persons. The serial number has been changed, damaged or removed.

### ● Normalization

- Normalization is only used if the flow meter is installed under conditions that differ from the standard calibration.
- To access the Normalization settings, go to the Settings Menu (⚙️) > Normalization.
- It is not recommended to change these settings. Only experienced users should change these settings.
- Press the arrow (←) to return to the previous screen.

### ● Normalization default setting:

- Temperature = 20°C
- Pressure = 100 kPa

### ● Advanced Settings

- If you need to access the advanced Settings, please contact your local dealer. Alternatively, contact **WiseAir Technologies**.

## Calibration

The sensor is calibrated before delivery. The calibration date is printed on the certificate which is shipped with the sensor.

Flow meters require calibration to remain accurate. The frequency of calibration depends greatly on the level of contamination within your system. By using insertion style flow meters wherever possible, you can install and remove them without the need for shutting the system down, virtually eliminating any lost production time caused by periodic maintenance.

We recommend you calibrate the sensor every 2 years. The calibration is excluded from the product warranty. For more information, please contact **WiseAir Technologies**.

## Need Help ?

Contact your local dealer. Alternatively, contact **WiseAir Technologies**

### ● Call Us

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

### ● Email Us

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



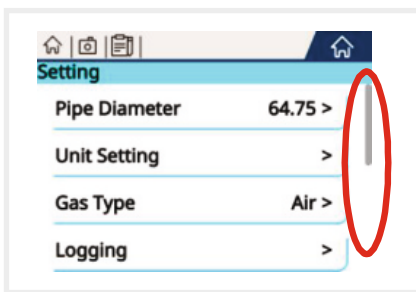
## Technical Support

### Questions :

- I can't see all menu items
- The touch screen doesn't work
- Help! My sensor is in the wrong language.
- My sensor isn't reading correctly
- How do I clean the sensor?

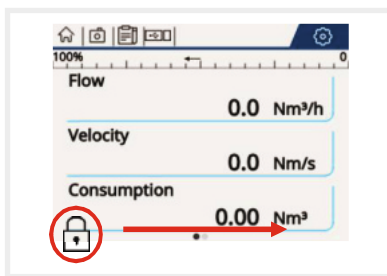
### I Can't See all Menu Items

- On some menus, you will need to scroll up and down to see all items. This is indicated by a scroll bar on the right side of the screen.



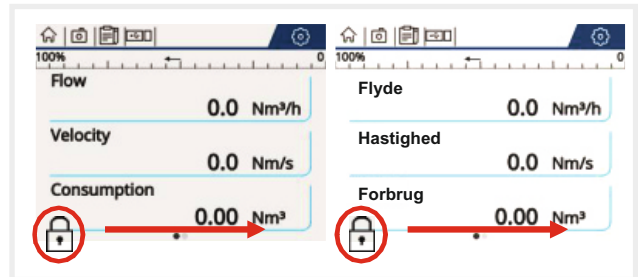
### The Touch Screen Doesn't Work

- If the touch screen doesn't work:
  - Clean the screen
  - Make sure the Screen Lock is off.
- If the lock screen symbol is present, press the symbol, hold and drag it to the right of the screen.
  - Use your finger to touch the screen.
  - The touch screen does not work if you use finger nails or pens.
- Try pressing harder, or softer



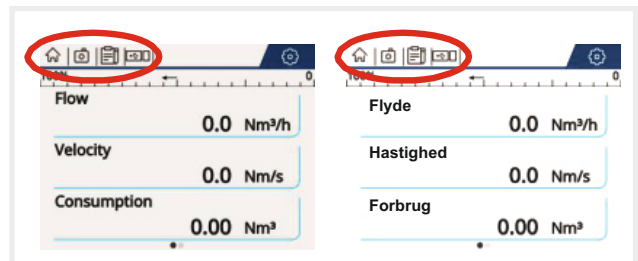
### Help ! My sensor is in wrong language

- If you need to change the language :
  - Step 1 - Unlock the Screen If the lock Screen symbol (🔒) is Present, press the symbol, hold and drag it to the right of the screen.
- If the screen lock symbol is not present, skip this step.



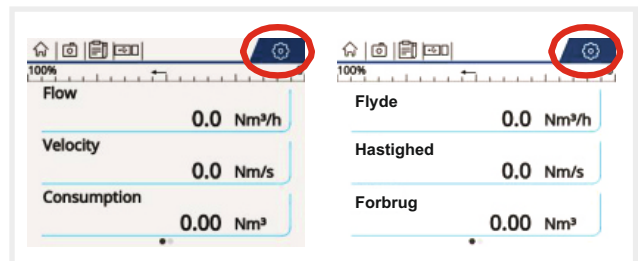
### Go to the home page

- Click on the Menu Icon on the top left of the screen, then click on the home icon 🏠



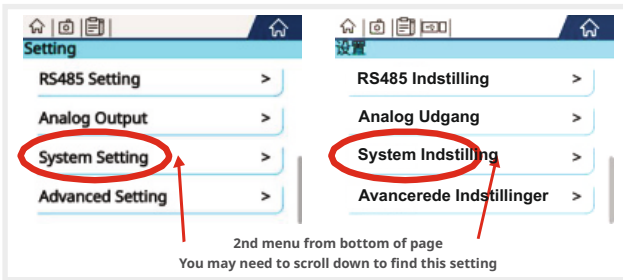
### Go to Settings

- Click on the Settings Icon ⚙️ on the top right of the home page.



**Go to System Settings**

- Scroll to the bottom of the setting screen.
- Press the "System Setting" Menu 2nd menu from bottom

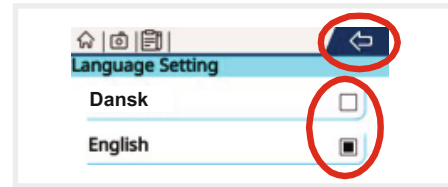
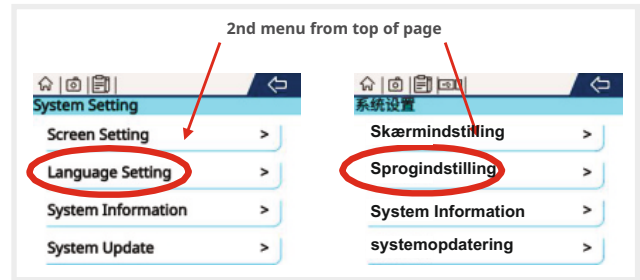


**Select desired language**

- Press the Arrow button (←) to save your selection and return to the previous screen

**Go to Language Settings**

- Scroll to the top of the system setting screen.
- Press the "Language Setting" Menu 2nd menu from top



**My Sensor Isn't Reading Correctly**

- If your sensor is not reading the correct values, follow these steps.

1. Make sure the sensor is suitable for your system. Refer to the "Specifications" section for details.

2. Make sure the sensor is calibrated. Sensors should be calibrated every 2 years. Contact your local dealer or WiseAir Technologies for calibration.

3. Make sure the sensor tip is free of contamination.

4. Make sure the sensor is installed correctly. Refer to "Installation — Mechanical" for more information. The sensor should be installed vertically to the pipe, away from obstructions. Typical installation errors include:

- Installing sensor upside down or at an angle
- Installing sensor too close to bends and other obstructions
- Sensor tip is not in the center of the pipe, eg its too low or too high
- Installing sensor in the opposite direction to the gas flow
- Installing sensor directly on the outlet of the compressor
- Gas flow rate too low. Note: below 10 Nm/s the flow meter reading will be zero.

5. Make sure the sensor is wired correctly. Refer to "Installation — Electrical(Wiring)" section for more information.

6. Make sure the following sensors settings are correct:

- Inner Pipe diameter (not outer diameter)
- Unit of Measurement
- Gas Type
- Communication settings (RS485 or Analog) Refer to the "Setting Up the Flow Meter" and "Communication Settings" sections for more information.

7. If you have adjusted Normalization or Advance Settings, reset these to factory default.

- Normalization default setting: Temperature = 20°C and Pressure = 100 kPa.

8. Is your associated equipment compatible with the flow meter?

If you are still having problems, contact your local dealer or **WiseAir Technologies**.

**How Do I Clean the Sensor?**

- If you need to clean the sensor it is recommended to use a clean, dry cloth. For stubborn marks, use distilled water or isopropyl alcohol only.

**Please note:** contamination on the sensor tip will affect calibration and accuracy of the sensor. Removal of the contamination may not fix the issue.

## Commissioning Report

### About the Sensor

Part Number WAFS - 103			
Serial Number			
Installed by		Installed on (date)	
Calibration (Valid till)		Warrenty (Valid till)	

### Installation

Step	Task	Yes	NA	No	Comments	Sign
1	Flow meter installed in correct location and orientation?					
2	Flow meter installed away from obstructions					
3	Sensor tip aligned with center of pipe					
4	Sensor aligned with direction of gas flow					
5	Electrical wiring checked					
6	Sensor setting configured for : inner pipe diameter unit of measurement gas type and communication				inner pipe Diameter : Gas Type : Unit of Measurement :	
7	Modbus settings ckecked					
8	Readings (flow, velocity, consumption & temperature) visible on display					

Initials of WISEAIR Representative

Initials of Customer

# 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



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