

How to Solve Common Failures of Ultrasonic Flowmeters

Problem	Cause	Solution
Ultrasonic flow meter probe alarm	<ul style="list-style-type: none"> ● The probe is seriously fouled ● When the conveying medium contains liquid impurities such as water, the pressure pipe may accumulate liquid or freeze and become clogged. 	<ul style="list-style-type: none"> ● Regularly clean the probe (recommended once a year). ● Use air blowing or electric tracing for impulse lines.
Large instantaneous flow fluctuations	<ul style="list-style-type: none"> ● The signal strength fluctuates greatly, and the measured fluid fluctuates greatly. 	<ul style="list-style-type: none"> ● Adjust the probe position to increase signal strength (maintain above 3%) and ensure signal strength stability. If fluid fluctuations are significant, the position may not be optimal; reselect a location ensuring compliance with the requirements of 10D ahead and 5D behind.
External clamp-on ultrasonic flowmeter has low signal	<ul style="list-style-type: none"> ● The setting parameters are incorrect ● Wrong installation method 	<ul style="list-style-type: none"> ● Check parameter settings and probe installation. If there is paint or rust on the pipeline surface, polish it off. ● Install the probe away from elbows or connections. If the pipe is not full, use parallel insertion of the probe. If the water flow is unstable, consider changing the installation point.
The signal of the plug-in probe decreases after being used for a period of time	<ul style="list-style-type: none"> ● The probe is deflected ● The scale on the probe surface is thick 	<ul style="list-style-type: none"> ● Re-adjust the probe position. ● Clean the emitting surface of the probe.
The instrument cannot be used under strong on-site interference	<ul style="list-style-type: none"> ● The power supply fluctuates widely. ● There is interference from frequency converters or strong magnetic fields around 	<ul style="list-style-type: none"> ● Provide stable power supply to the instrument. ● Install the instrument far away from variable frequency drives and strong magnetic field interference.

	<ul style="list-style-type: none"> ● Incorrect ground wire 	<ul style="list-style-type: none"> ● Standardize the grounding wire setup.
After powering on, it only has backlight and no characters displayed.	<ul style="list-style-type: none"> ● General failure of the chip in the program 	<ul style="list-style-type: none"> ● Return the instrument to the manufacturer
No display when booting	<ul style="list-style-type: none"> ● Power properties do not match the instrument's rated values or the fuse is blown 	<ul style="list-style-type: none"> ● Check if the power properties correspond to the rated values of the instrument and if any fuses are blown. If none of the above are found, contact the manufacturer.
The reading is inaccurate and the error is large.	<ul style="list-style-type: none"> ● Sediment at the top and bottom of the horizontal pipeline interferes with ultrasonic signals where sensors are installed ● Sensors installed on pipes with downward flow where the pipe is not fully filled with fluid ● Presence of devices causing strong fluid flow fluctuations such as Venturi tubes, orifice plates, vortex/turbine flowmeters, or partially closed valves within the range of sensor transmission and reception, leading to inaccurate readings ● Mismatch between the input diameter of the ultrasonic flowmeter and the inner diameter of the pipe 	<ul style="list-style-type: none"> ● Install the sensor on both sides of the pipeline and check if the 91-window percentage is within 100 ± 1. If not, adjust the installation distance to change the percentage. ● Install the sensor on a pipeline segment filled with fluid. ● Install the sensor far away from the mentioned devices, with an upstream distance of 30D and a downstream distance of 10D from the devices, or relocate it upstream of the mentioned devices. ● Modify the pipe diameter to match.
Readings are unstable and change drastically	<ul style="list-style-type: none"> ● Large pipe vibrations or presence of flow-changing devices (such as flowmeters installed downstream of control valves, pumps, or throttling orifices) where flow sensors are installed 	<ul style="list-style-type: none"> ● Relocate the flow sensor to a place far from sources of vibration or upstream of devices altering flow conditions.
When the control valve is partially closed or the flow rate is reduced, the reading will increase.	<ul style="list-style-type: none"> ● The sensor is installed too close to the downstream of the control valve. When the valve is partially closed, the actual flow rate measured is the increased flow rate due to the throttling effect of the control valve, causing an increase in flow velocity due to the reduced diameter. 	<ul style="list-style-type: none"> ● Position the sensor away from control valves with an upstream distance of 30D from the control valve, or move the sensor upstream of the control valve with a distance of 5D from the control valve.

<p>The ultrasonic flow meter works normally, but suddenly it no longer measures flow</p>	<ul style="list-style-type: none"> ● Changes in the measured medium ● Gasification of the measured medium due to high temperatures. ● The temperature of the measured medium exceeds the sensor's temperature limit. ● Aging or depletion of the coupling agent under the sensor ● High-frequency interference causing the instrument to exceed its own filtering value ● Data loss within the computer ● Computer crash 	<ul style="list-style-type: none"> ● Change the measurement method ● Lower the temperature ● Lower the temperature ● Reapply coupling agent ● Keep away from sources of interference ● Re-enter all correct parameters (after setting parameters on version 18 instrument, it needs to solidify parameters in window 26). ● Restart the computer.
<p>The sensor is good, but the flow rate is low or no flow rate</p>	<ul style="list-style-type: none"> ● The outer paint or rust on the pipeline is not thoroughly removed. ● Uneven surface of the pipeline or installation of the ultrasonic flowmeter at welded seams. ● The measured medium has low levels of impurities or suspended solids. ● The sensor is installed on fiberglass pipelines. ● Installing the sensor on a sleeve weakens the ultrasonic signal. ● Poor coupling between the sensor and the pipeline, with gaps or air bubbles on the coupling surface. ● The pipeline has a lining, severe internal corrosion, or scaling. 	<ul style="list-style-type: none"> ● Clean the pipeline again and reinstall the sensor. ● Flatten the pipeline or move away from weld seams. ● Choose a suitable alternative type of instrument. ● Remove the fiberglass. ● Move the sensor to a section of the pipeline without sleeves. ● Clean off the previous coupling agent completely and reapply. ● Select smooth inner surface pipes like steel pipes or switch to insert-type sensors.