

Expert Techniques

for on-site measurement

Useful tips that are not found in any User's Manual

No.1: Using a measuring instrument in an environment with radiation noise

No.2: Using a measuring instrument in an environment with extraneous light

No.3: Using a measuring instrument in special environments

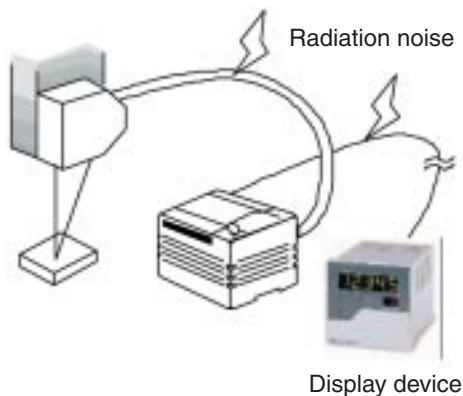
No.4: Measurement by ignoring flaws

Expert Techniques for on-site measurement

Useful tips that are not found in any User's Manual

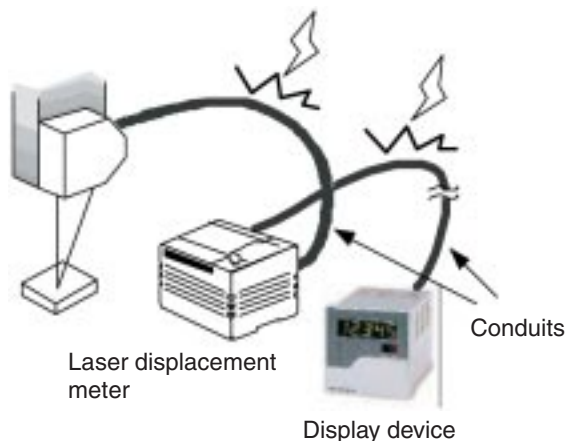
No. 1: Using a measuring instrument in an environment with radiation noise

► **Common problem on site**



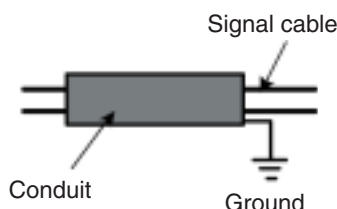
When a power line or a motor inverter is present near a sensor cable or an output signal cable, radiated noise may transmit through these cables. Radiated noise propagates through the air; this noise transmitting through the cable may interfere with the measurement, resulting in unreliable data.

► **An expert's solution**



Run the sensor cable and output cable through a grounded metal conduit. The conduit prevents noise interference by dissipating the noise to the ground before the noise transmits through the cable.

► **Expert's technique**



Precaution regarding the use of a conduit for noise suppression

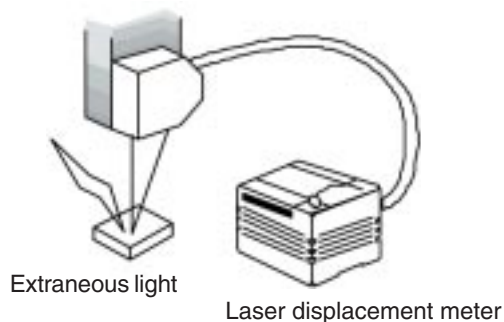
Be sure to connect the conduit to ground. Otherwise, it will not properly dissipate the noise.

Expert Techniques for on-site measurement

Useful tips that are not found in any User's Manual

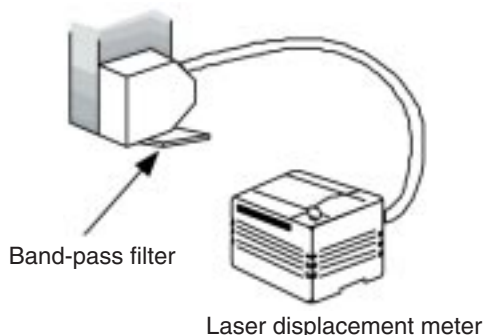
No. 2: Using a measuring instrument in an environment with extraneous light

► **Common problem on site**



The measurement data may fluctuate when a hot glowing object is measured or when the receiver receives extraneous light such as the beam of a laser-welding machine. The following measure is effective for preventing the influence of extraneous light.

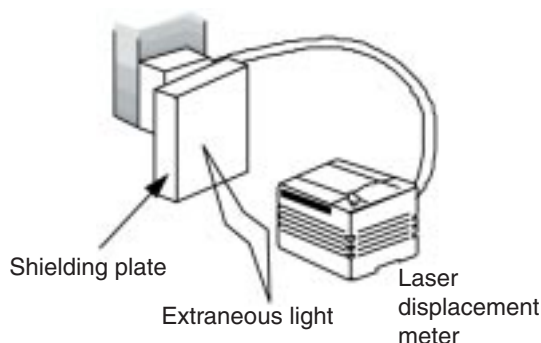
► **An expert's solution**



To prevent the influence of extraneous light, interrupt the extraneous light so that it does not strike the receiver of the sensor head.

Attach a band-pass filter in front of the receiver. The band-pass filter allows the passage of only the laser beam emitted from the transmitter. The band-pass filter blocks the extraneous light and ensures stable measurement.

► **Expert's technique**



Other solutions?

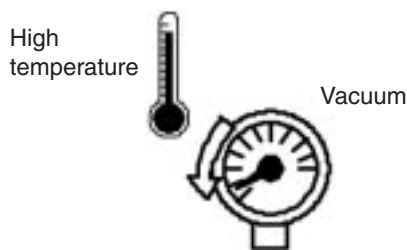
In addition to the solution above, there is another measure to prevent the influence of extraneous light. Install a shielding plate as shown in the figure to block the extraneous light directly.

Expert Techniques for on-site measurement

Useful tips that are not found in any User's Manual

No. 3: Using a measuring instrument in special environments

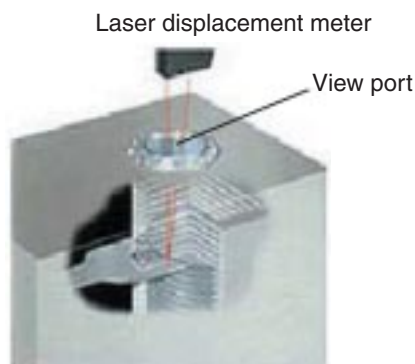
► **Common problem on site**



In manufacturing processes, measurement often must be conducted in special environments such as high temperatures or a vacuum. Such extreme environments are also used to investigate the characteristics of products. Normal precision instruments, however, cannot be used in such environments.

Use the following method to conduct measurements in these environments.

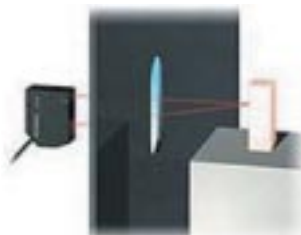
► **An expert's solution**



Measuring targets from outside the device through a view port enables stable measurement.

This allows accurate measurement because the measuring instrument can be installed in normal environments.

► **Expert's technique**



Measuring thermal expansion of metal material

Application example

This method is used in real applications such as checking robot movement testing product characteristics.

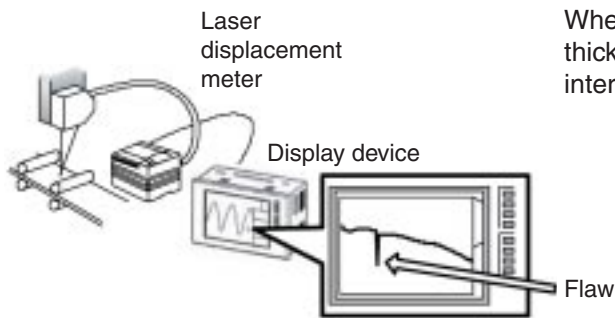
Be sure to calibrate the measuring instrument before use because measurement through a glass view port may change the detection characteristics of the instrument.

Expert Techniques for on-site measurement

Useful tips that are not found in any User's Manual

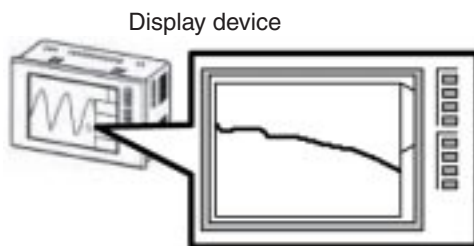
No. 4: Measurement by ignoring flaws

► **Common problem on site**



When slow changes are measured such as a change in thickness, abrupt changes, such as vibration or flaws, may interfere with accurate measurement.

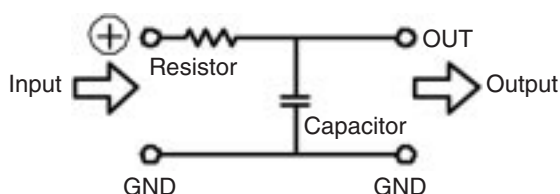
► **An expert's solution**



The low-pass filter (LPF) function lets the display device ignore flaws and respond only to the overall changes, resulting in stable measurement.

There are special devices that provide the low-pass filter function. Some display devices also feature this function.

► **Expert's technique**



What is the low-pass filter function?

The low-pass filter function allows the display device to ignore abrupt changes and respond only to slow changes. The circuit on the left shows the simplest low-pass filter mechanism.

In this circuit, the capacitor and resistor determine the level of abrupt changes to which the display device responds.