

## Quick Diagnostics for HVAC with Fluke Infrared Thermometers

### Application Note

**Saving man-hours and preventing downtime of HVAC systems is easier than ever with Fluke's new line of reliable and accurate infrared non-contact thermometers. The thermometers require no set-up and have a response time of less than a second. They're therefore the perfect choice for a host of troubleshooting jobs in HVAC systems including: checking supply and return registers, identifying leaky ducts, locating broken ducts, isolating faulty insulation, room balancing, temperature mapping, evaluating steam distribution systems, calibrating thermostats and checking compressor lines. All that's necessary is to stand at a comfortable distance from the target, point the unit at the surface to be monitored, pull the trigger, and read the temperature.**



#### **Point and shoot temperature measurements**

Installing and maintaining HVAC systems requires accurate temperature measurements to diagnose duct leakage, supply and return air temperatures, plumbing lines and other heat-related problems. Technicians have traditionally done this by perching on ladders,

crawling on hands and knees or squeezing by superheated pipes to take readings with a contact thermometer. Locating problems can often be long and labor intensive, especially in large offices and factories where it is necessary to drill holes in ducts to insert thermocouples or thermometers.

These problems are easily solved with non-contact infrared thermometers such as those from Fluke's new range. Fluke's new IR thermometers measure temperatures with great accuracy: between 1 and 2% depending on the model, and with a response time of less than a second. What's more, with a clear line of sight, a technician can measure any target within the instrument's range. Depending on the model and target size, precise readings can be made from distances up to 20 meters.



When compared with contact thermometers, time savings can be measured in hundreds of man-hours annually, and technicians can do a more thorough job because the speed and ease of operation of a Fluke non-contact thermometer allows more frequent gathering of temperature data.

### **Room balancing**

Technicians no longer have to place thermometers on walls, floors, and ceilings to determine room temperature at different heights and wait 15 to 20 minutes for each thermometer to stabilize. Using a Fluke non-contact thermometer, all that is necessary is to point the thermometer at the base of the wall and, by scanning up the wall in small increments, note each time the temperature goes up or down a degree. Readings are instantaneous. This procedure enables technicians to discover if vents are properly located, whether the HVAC unit is large enough for the space being heated or cooled, or if more efficient ducts need to be installed.

### **Supply and return registers**

A Fluke non-contact thermometer allows the technician to check supply and return registers to evaluate whether the temperature difference is correct. The temperature differential between the supply and return registers of a cooling system should fall between 10 and 12 °C. In a heating system this difference should be between 17 and 39 °C. A large variance could indicate an inefficient duct system, dirty filters or possible problems with the exchange coils.

### **Duct work**

Duct joints are constantly subjected to vibration, expansion and contraction. If they loosen or fail, a duct can blow hot or cold air into the wrong areas and/or suck in air from surrounding areas. Regularly scanning the surface of ductwork will quickly reveal temperature spikes wherever the insulation has come apart

With a Fluke non-contact thermometer, the technician can monitor many feet of ductwork in the time it previously took for a single reading with a contact thermometer.

### **Steam distribution systems**

Diagnosing the condition of a steam trap can be dangerous. Pipes may contain superheated steam, and hot traps are frequently located in inaccessible places. Fluke's non-contact thermometers allow the technician to quickly diagnose blown or plugged steam traps from a safe distance as part of an ongoing steam trap maintenance program. Moreover, non-contact measurements greatly reduce man-hours by cutting diagnosis time.

### **Furnace performance**

A Fluke non-contact thermometer allows the technician to test how well a furnace is operating by simply checking the flue temperature. If the difference in temperature rise from the furnace is greater than 30 °C, up to half of the cost of running the furnace is being wasted.



**Other applications**

- Checking to see if a coil is sweating by checking the temperature of the condensate line. If it's cold, it's working.
- Checking temperature on an emergency relief valve to see if a water heater or boiler has a problem and is ready to blow.
- Checking for leaks. If an area of wallboard is wet, a lower temperature reading will be found at the source of the leak.
- Measuring the existing air from a coil and at a supply air grill. The difference reveals thermal gain in ductwork located in a hot attic.

**An indispensable tool**

Fluke portable non-contact thermometers are indispensable diagnostic tools for the HVAC professional. Their sensitivity, quick response and ease of use can make the difference between fixing a problem and having enough time to prevent it from occurring in the first place.

As such, they put temperature measurement in a whole new context – determined in seconds, not minutes.

**For quick temperature checks**

If you are looking for a basic non-contact thermometer for a variety of applications, the Fluke 62 Mini Infrared Thermometer is the tool for you. It is priced to fit any toolbox and is small enough to fit in your pocket.

<b>Temperature range</b>	-30 to 500°C
<b>Response time</b>	≤ 0,5 second
<b>Best Accuracy</b>	± 1.5% of reading
<b>Distance to spot ratio</b>	10:01



**Fluke 62**

**The professional's Choice**

The Fluke 63, 66 and 68 Infrared thermometers. These are the most popular non-contact thermometers in the world. It offers an ideal combination of precision and value for the technical professional. All these models feature laser sighting and are accurate, compact, reliable and easy to use, just what a professional needs.

<b>Temperature range</b>	Fluke 63 Fluke 66 Fluke 68	-32 to 535°C -32 to 600°C -32 to 760°C
<b>Response time</b>	≤ 0,5 second	
<b>Best Accuracy</b>	Fluke 63	For targets at: -32 to -26 °C ± 3 °C -26 to -18 °C ± 2,5 °C -18 to 23 °C ± 2 °C 23 to 510 °C ± 1% of reading or ± 1°C For targets above 510°C: ± 1,5% of reading
	Fluke 66 and 68	For targets at: -32 to -26 °C ± 3 °C -26 to -18 °C ± 2,5 °C -18 to 23 °C ± 2 °C For targets above 23°C: ± 1% of reading or at ± 1°C
<b>Distance to spot ratio</b>	Fluke 63 Fluke 66 Fluke 68	12:1 30:1 50:1



**Fluke 68**

**Fluke 66**

**Fluke 63**

**For those who demand maximum performance**

The Fluke 572 and 574 Precision Temperature Infrared Thermometers feature a True Dimension™ laser sighting system, which precisely outlines the target measurement area. With its unique combination of features and DataTemp software these models can adapt to any work environment.

Also available special purpose model (Close Focus) which measures very small targets.

<b>Temperature Range</b>	-30 to 900 °C
<b>Response time</b>	250 ms
<b>Best Accuracy</b>	± 0.75% of reading
<b>Distance to spot ratio</b>	Standard: 60:1 Close focus: 50:1

**Photographic Infrared Thermometer**

The Fluke 576 takes snapshots automatically of temperature measurements which are superimposed with temperature, date, time as well as additional measurement data – ideal for the documentation of inspection results. With its unique combination of features and DataTemp software, the Fluke 576 can adapt to any work environment. Also available is the Fluke 576 close focus special purpose model, which measures very small targets.

<b>Temperature Range</b>	-30 to 900 °C
<b>Response time</b>	250 ms (95% of reading)
<b>Best Accuracy</b>	± 0.75% of reading
<b>Distance to spot ratio</b>	Standard: 60:1 Close focus: 50:1



Fluke 572

Fluke 574



Fluke 576

**Fluke.** *Keeping your world up and running.*

**Fluke Corporation**  
PO Box 9090, Everett, WA USA 98206

**Fluke Europe B.V.**  
PO Box 1186, 5602 BD  
Eindhoven, The Netherlands

**For more information call:**  
In the U.S.A. (800) 443-5853 or  
Fax (425) 446-5116  
In Europe/M-East/Africa (31 40) 2 675 200 or  
Fax (31 40) 2 675 222  
Canada (800)-36-FLUKE or  
Fax (905) 890-6866  
Other countries (425) 446-5500 or  
Fax (425) 446-5116  
Web access: [www.fluke.com](http://www.fluke.com)