

SYSTEMS & SOLUTIONS

Sensors and Old-Fashioned Horse Sense

"you wouldn't think knocking down the building next door would affect the way your heat works, would you?" the Old-timer said, taking a sip of black coffee. The gleam in his eye told us we were in for a good story. "You wouldn't think an empty lot could turn your boiler off, would you?"

"Huh?" We all looked at each other.

"Were these two buildings connected in any way?" one of us asked.

"Nope, just a couple of small New York City apartment houses separated by a narrow alley. The steam system worked fine until the demolition crew knocked down that building next door. Then it never seemed to get warm enough in most of the apartments."

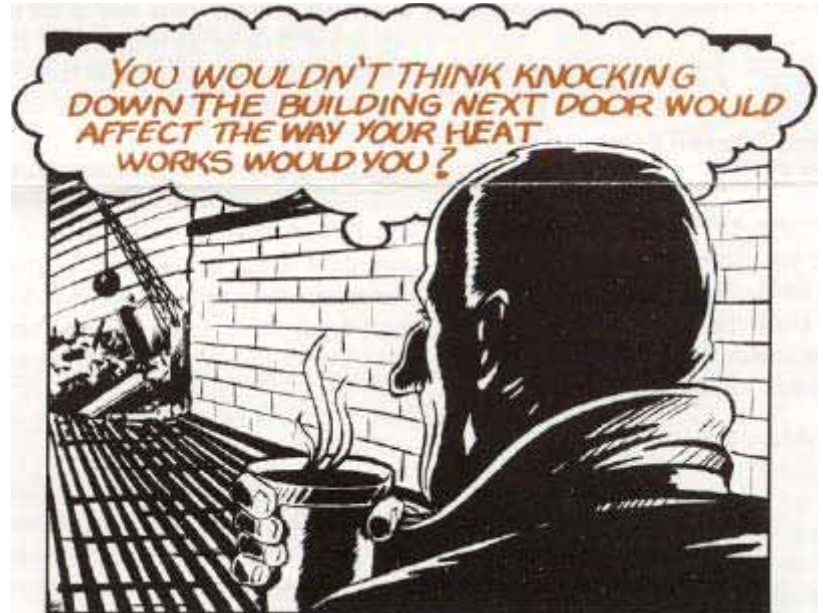
"Well, what's the answer?" one of our guys blurted out.

"Hold your horses!" the Old-timer said with a chuckle. "I can't make it that easy for you guys, can I? First, I have to see how you'd go about solving this problem." He took another sip of coffee.

--Wela1Keri"it fJVer-fot a~ew minutes and then one of us offered, "Well, after we got a good description of the problem, we'd ask ourselves 'What can cause that? Then we'd eliminate each possible cause one at a time."

"Good!" the Old-timer said. "That's the best way to approach *any* problem. Think about the entire system and be methodical. Good! So on this job you have insufficient heat. What do you look *for*? What questions do you ask? And who do you ask?"

We were into the game now. The Old-timer has a way of doing that to you. He drags you right in and gets you thinking.



One of our guys leaned forward and said, "I'd ask the superintendent or the building owner what changes had taken place in the building since last winter."

"And," the Old-timer jumped in, "the super tells you not a blessed thing has changed! But that's good you asked the super. Very good: Those guys have a remarkable talent for knowing what's going on. They live with the building. They may not have the technical explanations for what's going on, but they can usually give you the right clues. Unfortunately, in this case, the super was no help. So what's next?"

"Well, I suppose we'd start from scratch and check out the entire system," one of us said. "Start with the boiler and work our way through the system. But what's this about the building next door? You said it had something to do with the problem."

"Yeah, I did say that, didn't I?," the Old-timer said, stroking his chin.

"Actually, the building next door-or in this case, the empty lot next door-was the culprit! That lot was on the south side of my building. The Heat-Timer's outdoor-air sensor was on the south side as well, by the way!" He smiled at us.

We all started to see the light at the same time (so, apparently, did the sensor!). "The sensor should be on the north side of the building," we blurted almost in unison.

"It couldn't be on the north side," he said. "There was another building butting up against my building on the north side. That happens a lot in New York, you know."

"Was it sunny on the south side of the building?" someone asked.

"It was when they knocked down that building!" the Old-timer said with a laugh. "It didn't use to be, mind you, but it sure was now

"Did they have a shade over the sensor?" we wondered.

"Nope. Never needed one before. That old building provided all the shade you could possibly want. The guy who'd installed it long ago didn't bother with a shade. He figured all that sensor was ever gonna see was 'dark and gloomy.' And he was right. Until they knocked that building down, that is. Now that side of the building - and the sensor - gets more sun than a Florida grapefruit."

We looked at each other and started to laugh.

"Good one!" one of our guys said, clapping the Old-timer on the back. "I thought you'd like it," he said giving us a sly smile from over the edge of his coffee cup.

The Sensor Makes the System

Where you place the Heat-Timer outdoor-air and heating system sensors can make or break the system. A little care and some common sense can save you a lot of trouble - and a lot of fuel as well.

The outdoor-air sensor tells the Heat-Timer when it's cold enough outside to turn the boiler on. You determine this set-point temperature when you install the system, but Mother Nature and a whole bunch of other gremlins can switch things around on you in a hurry if you're not careful.

Take the Old-timer's job, for instance. Ideally, the outdoor-air sensor should be on the north side of any building because that's the side that usually stays "dark and

"The steam system worked fine until the demolition crew knocked down that building next door".

gloomy" during the heating season. You don't want sun shining directly on the sensor because the sun's radiant energy will quickly raise the sensor's temperature and make the Heat-Timer "think" it's warmer outside than it really is. That's easy to understand, isn't it? Have you ever stood in a sunny spot on a cold day? It feels warmer than it actually is, right? That's because of the radiant heat. If you move from the direct sunlight into the shade, you'll immediately feel the drop in temperature. Radiant energy is a powerful force. It makes its presence known in a hurry! Just

think about how hot your car gets at the beach.

The same natural force affects the Heat-Timer's outdoor-air sensor, and that's why we like to see it in a well-shaded place. The north side of the building is usually best.

But suppose you can't get the sensor on the north side of the building? Maybe you have to take that second-best choice, as the Old-timer did.

In his building, the second-best choice was an alley on the south side of the building. It was close to the boiler room. It was shady. But the guy who set that system up years ago never figured his neighbor would knock down the building. That guy thought he was installing his sensor in a place that would be forever shady. He depended on that shade. But sometimes things change, and building owners who are used to things working a certain way often overlook those changes.

Good troubleshooters look for them right away, though.

The Laundry Room Caper

"I've got another one for you," the Old-timer said as he got up to get a second cup of coffee. "This one happened right here in New Jersey - in a building that had gone co-op a few years back. The shareholders had this basement apartment which they'd been trying to sell for quite a while. They finally got a nibble on it and were doing their best to impress the prospective buyer.

"It took a while before the guy was willing to sign on the dotted line. But just as he was about to make up his mind, he noticed this white stuff on one of the window screens. 'What's this,' he asked. The management agent looked at the fuzzy stuff and told him it was probably lint from the clothes driers which vented through the laundry room wall about twenty feet down the alley.

I'm not buying an apartment that has somebody's lint flying in through the windows,' the guy said. 'That's disgusting!' From what they tell me, the management agent went into a panic. He was so close to a deal, and now this.

"We'll move the vent,' the agent promised the guy. 'We'll fix it, don't worry! It's not a problem.'

We could see where this one was going. "They extended the drier vent way up high, right?" one of our guys said.

"Yep, got it about ten feet off the ground so the lint wouldn't blow in the guy's window. They pointed it straight up, too. They could have put it just about any-where, but you gotta understand, we're not talking about lucky people here. They could have

"...Mother nature and a whole bunch of other gremlins can switch things around on you if you're not careful".

put it anywhere, but they put it right under the Heat-Timer's outdoor-air sensor."

"That will give you a no-heat call, for sure!"

"Yep," said the Old-timer. "Every time a tenant throws in a load of wet clothes. But you know what the real problem was?"

"What?"

"They don't call heating professionals to move drier vents. We just wind up with the results. That's why we have to see systems, and not just problems."

Sensor Sense

It's easy to fool a sensor. It really is. All you have to do is expose it to excessive heat and it will "think" it's warm outside. It won't run the system when it should: people will get cold and they'll complain.

It works the other way, too. We remember seeing an outdoor-air sensor that sat directly under a broken rain gutter. During the winter, cold water dripped down off the gutter and froze. Eventually, it formed this huge icicle which swallowed up the sensor. The icicle wrapped the air sensor in its icy grip all day long. Even though most afternoons were warmer than most mornings, the sensor couldn't feel the change in the air temperature. It treated this building as though it were in Antarctica. The people were too hot so they opened their windows. That certainly didn't help the fuel bills.

It doesn't take a lot of effort on your part to avoid all these problems. All you have to do is be aware of what's going on around that sensor and do your best to protect it against "artificial weather."

Oh, and watch out for the neighborhood kids as well. Make sure that outdoor-air

sensor is high enough so they don't notice it. Many of our troubleshooting calls involve sensors that have been vandalized. Remember, if it's not connected to the Heat-Timer, the sensor can't sense a thing

Kids do the darndest things.

Heating System Sensor Problems

We had a call last winter from a building owner who complained about his high fuel bills. "The Heat-Timer was supposed to lower my bills," he said, "but I'm using more fuel now than ever."

We took a ride out to the job to see what was going on. We found a problem we see more often than you'd probably believe: Someone had hooked up this guy's heating system sensor to a domestic cold water line!

Now, the heating system sensor tells the Heat-Timer when the mains are filled with steam. Once it gets that signal, the Heat-Timer begins its countdown to burner shut-off (based, of course, on the temperature conditions of the day).

Needless to say, a cold water line is never going to send the required signal to the Heat-Timer panel. And then there are heating system sensors that people attach to electrical conduit lines and, believe it or not, sewer lines. These are very gratifying troubleshooting calls. We get to look so bright!

An Interesting Problem

We looked at a good one on Long Island not long ago. Here, again, the owner felt

his fuel bills were too high. This one was a large one-pipe steam system in a horseshoe-shaped building. The boiler sat in the center of the horseshoe and the steam mains reached around each wing of the building. At the end of each steam main we found a large float & thermostatic steam trap. The discharge from each steam trap dripped into a condensate transfer pump which sent it sailing back to the boiler-feed pump in the boiler room. We see this transfer-pump system in a lot of these horseshoe-shaped buildings. The

"Radiant energy is a powerful force. It makes its presence known in a hurry!"

pumps do a good job of quickly getting the condensate back to the boiler room. You see, the problem with gravity return lines in these long buildings is there's usually not enough height to properly pitch the return lines.

But the problem on this job wasn't the pumps or the traps. The problem was the location of the heating system sensor. Someone had strapped an aquastat on the pipe downstream of one of the end-of-main F&T traps. It was sensing condensate trickling out of the trap, not steam. Right off the bat, we knew that sensor was going to be slow to react. That meant the boiler was going to run longer than it should.

But worse than that, someone had set

that aquastat for 220 degrees - a temperature it would never see. Two-hundred twenty degrees is the temperature of steam when it's at about 3 psig pressure. Sure, they had steam at 3 psig at the boiler, but the pressure (and the temperature) at the inlet of the trap was considerably less than 3 psig because of the system pressure drop.

And, of course, the condensate temperature, several feet downstream of the trap, was much lower than 220 degrees. There was no way this sensor was ever going to see its set-point temperature. And if it couldn't sense the right temperature, it could never send that all-important signal to the Heat-Timer back in the boiler room. That's why the fuel bills were so high.

We relocated the sensor to the steam side of the trap and lowered its temperature

setting. We could have left it where it was (downstream of the trap) and lowered the

temperature setting, but as we said, it's better on the steam side of the system, not on the condensate side because we're trying to sense the moment when the system is filled with steam. Steam pipes heat more quickly than their condensate drip lines, and we're in the business of helping our customers save fuel without sacrificing comfort. That's why we moved it.

This was a rewarding one because the owner saw an immediate fuel savings on his next bill. And he didn't sacrifice any comfort to get those savings. In fact, his building was a lot more comfortable once we moved that sensor. People weren't roasting anymore. The shut their windows.

Gas Heat?

The Old-timer wasn't through yet. He

leaned back, laced his fingers behind his head and told us this last one.

"I looked at one in a Philadelphia apartment house a few years back. Another one of those cases where the burner ran forever. Right away I suspected the heating system sensor. I asked the super if he knew where it was. He shook his head up and down real fast. This guy was sharp."

"Did he take you right to it?" we asked.

"He sure did. In fact we didn't have to walk that far; it was right there in the boiler room."

"Did the steam main come back dry and end in the boiler room?" one of the guys asked.

"No, no. The super didn't have the sensor on a steam line."

"Oh, it was a hot water system?"

"No, it was a steam system. He just didn't have the sensor on a steam line."

"What did he have it on?"

"The natural gas line."

"Get outta here!" we said in one voice.

"Yeah, you see the system burned gas.

The super thought this was the best way to conserve fuel. He figured the Heat-Timer should sense the gas line. You know, sort of keep track of what's coming into the building. Good one, eh?"

We Hope You Sense An Opportunity....

At Heat-Timer, we're in the business of helping you find solutions to your system problems. Give us a call if you need help, or if you just need someone to bounce an idea off of. We're good listeners.

We appreciate the business you've given us over the years. We believe our Heat-Timer controls are the finest products of their type on the market. We stand behind them with our years of experience and our willingness to help you.

We're here for you whenever you need a solution to your system problems. Just pick up the phone.

SEE YOU NEXT TIME!