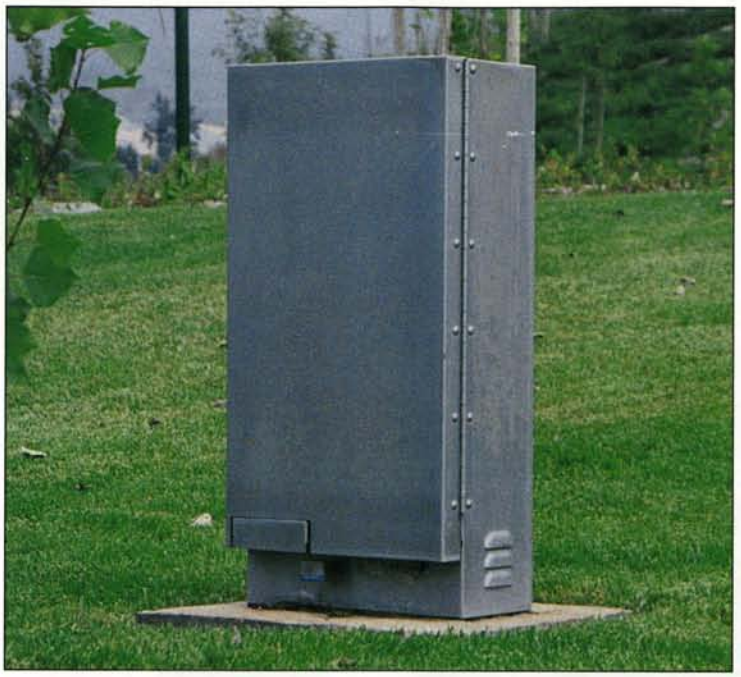
Controller Enclosures: *Outdoor Armor*

By Matthew Trulio

When it comes to scheduling irrigation for intricate landscapes, today's sophisticated controllers can do it all. They can collect evapotranspiration, temperature, humidity, microclimate and solar radiation data and calculate schedules. They can detect malfunctions such as pressure losses or environmental variables such as high temperatures and override the program to shut down down the system. They can be scheduled to irrigate different zones of planting beds and turfgrass differently. Combined with moisture and rain sensors, they can be programmed to irrigate "as needed." The list of possibilities is endless.



A stainless-steel enclosure protects a controller and delicate circuitry in a park setting. Photo courtesy: VIT Products/Strongbox.

What controllers can't do, however, is protect themselves. Even the most high-tech, flexible, reliable — and expensive — piece of controller wizardry is vulnerable to the elements, vandalism and theft. That's where controller enclosures, cabinets or "boxes" come in. They protect your controller investment.

"Enclosures are particularly necessary for controllers in high-traffic areas like parks, mostly to prevent vandalism," says John Tilton, general manager of Cross Brothers, which offers both stainless-steel and cold-rolled steel enclosures. "But enclosures also keep irrigation clocks safe from the environment."

Materials and Design

Enclosures are made from a number of different materials. However, there are two you're most likely to encounter in researching them:

• *Cold-rolled steel.* Cold-rolled steel is "new" steel — it isn't made from scrap metal like hot-rolled steel. Its carbon content is lower, which makes it less prone to rust and corrosion. But left unprotected, cold-rolled steel will rust. That makes paints and painting methods used to protect enclosures made from this material critical.

"One thing we're experimenting with is a cold-rolled steel anti-graffiti cabinet," says Larry Pellerin, production for Le Meur Manufacturing, which makes both stainless-steel and cold-rolled steel enclosures. "It's a little costly right because our volume isn't up, there's a paint available that is graffiti-proof. We've started to offer that option to our customers."

• *Stainless steel.* Stainless steel is steel alloyed with chromium. The better grades of stainless steel (grade 304 or better recommended and used by most enclosure manufactuers) will not rust and require little or no cleaning. However, they can be 30- to 40-percent higher in price than cold-rolled steel.

A number of manufacturers produce both stainless-steel and cold-rolled steel versions of their products. Between the two, most recommend going stainless when budget allows.

"Customers sort of 'migrate' to stainless steel over the years," explains Don Pagano, president of VIT Products/Strongbox, which offers both stainless-steel and cold-rolled steel enclosures. "When you first bring your products to an area, people hesitate at first but eventually come to the conclusion that, yes, they've had vandalism and theft problems. They'll be specifying and using enclosures, but usually they start with painted metal models. Then they'll discover that stainless steel does better than painted metal in terms of maintenance. No matter how well they're made, standard-steel boxes are only as good as their coatings, and even those are only as good as the person installating the enclosure, who might scratch it in the process. Once you have a scratch on any painted steel box, rust will begin. That means sanding and repainting. Stainless steel doesn't have that problem."

Mike Deming, vice president of sales and marketing for Rainman/Division of Electrorack, which manufactuers both stainless and cold-rolled steel enclosures, agrees. "You've got to consider quality and longevity," he notes. "Municipalities in particular don't want to replace enclosures in a year or two. You may save a few dollars with a less expensive box, but it's just not economical when you have to replace it every year or so. A stainless-steel box will last at least 10 years."

Adds Rick Malkin, a product manager for the commercial division of Rain Bird Sales Inc., "We have found that in order to get a high-quality metal painted properly it costs as much as stainless steel."

Stainless steel and cold-rolled steel aren't the only materials being used in enclosure construction. Plastic enclosures are available; however, they are usually designed for smaller, less sophisticated, indoor-mounted controllers and are not a viable (or wise) protection choice for today's high-end units. Another enclosure material option is fiberglass.

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"The advantage of fiberglass is that it's less expensive than stainless steel," asserts Mike Devine, president of Hot Box Manufacturing Inc., maker of fiberglass enclosures for backflow protection devices, which recently added enclosures to its line. "Fiberglass also won't rust like galvanized steel. Our enclosures are UV- and vandal-resistant and, because we use a 'male' mold in their manufacturing process, they are rough and nonreflective on the outside."

Features to Consider

To the unenlightened viewer, one stainless-steel or cold-rolled steel enclosure may look just like the next, but there are subtle and not-so-subtle design differences. For example, some manufacturers, such as Cross Brothers, manufacture their products with slanted or cambered roofs, so that rain or irrigation water runs off. In addition to product-specific design features, however, any enclosure should have:

• *Weatherproof sealing.* Water is the enemy of electronics. Rubber gaskets or seals around door openings are a must. "Make sure the doors fit very tightly," Pellerin of Le Meur suggests. "In addition to keeping moisture out, that prevents anybody from being able to pry them open with a bar or rod."

• *Ventilation.* Heat is another enemy of electronics. Adequate enclosure ventilation is crucial. (In extreme heat situations, electric fans have been installed inside enclosures.)

Ventilation is usually accomplished through louvers, the placement of which depends on the particular manufacturers. Many, however, incorporate screens of various mesh sizes, which keep out insects, dirt and even dust.

"Ventilation is critical, especially in areas of high humidity," says Jeanne Cantu, national specification sales manager for Toro Irrigation.

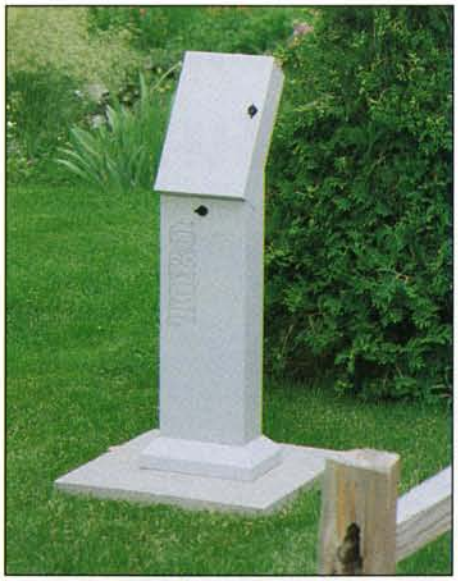
Adds Pagano of VIT/Strongbox, "Without louvers, the box will set up its own little environment and sort of 'rain' or 'mist' inside, getting moisture all over the things you're trying to protect."

• *A strong locking mechanism.* An enclosure's weakest link is its locking mechanism. Many manufacturer recommend no less than a three-point locking system. Both key lock and padlock set up are available. When considering an enclosure, ask the manufacture to carefully explain the lock involved.

On a related note, hinges and all "extra" hardware should be manufactured from the same material as the enclosure itself, as should all welds. It makes little sense to select an expensive stainless-steel enclosure that doesn't employ the same material in crucial areas. "Not only do we have a stainless-steel pin for our hinges, but the hinges are 'staked' so that thieves or vandals can't take the pin out," says Pellerin.

• *Ample capacity.* The enclosure should have enough space to hold the required components. It seems like an obvious requirement, but inadequately sized enclosures *have* been specified all too frequently. Although enclosure manufacturers strive to make their products accommodate the various high-end controllers, some controller products may require controller-manufactured enclosures. Always check with the controller manufacturer. Specific places inside to store irrigation plans and controller manuals are also a plus.

• *Ease of access.* Maintenance personnel shouldn't have to contort to unlock or open an enclosure — they have enough



Cold-rolled painted steel pedestal-mount controller enclosures are frequently used in golf course applications. Photo courtesy: Toro Irrigation.

hard work to do. Granted, locks can and often should be "hidden" from the view of passersby, but they shouldn't be so hidden that they are a nightmare for those who need access. Most enclosures have swinging doors in front or back of the unit, which function well. There are, however, variations on this theme. The Turfman enclosure from Rainman, for example, is designed with its door in the top of the enclosure.

Design Situations and Considerations

The choice between stainless-steel, cold-rolled steel, fiberglass and even plastic enclosures goes beyond structural integrity. How the enclosure will "look" in the environment, an environment generally composed of soft plant materials, can be equally important. In the past, says Karen Moore, national sales manager for VIT Products/Strongbox, there was a belief that brown or green-colored enclosures would "blend in" better. That's changed, she asserts.

"I see people going in the direction of stainless steel," says Moore. "Years ago there was this perception that stainless steel would be reflective and stand out. What we're discovering is the 'chameleon effect' of stainless steel — it actually blends in much better than a colored enclosure trying to replicate nature. Stainless steel provides a subtle reflection of the colors around it."

The key word, more observes, is subtle. To that end, VIT Products/Strongbox and a few other manufacturers give their stainless-steel enclosures a brushed finished to make it less "mirror-like."

Although the majority of enclosure manufacturers who make both stainless-steel and cold-rolled steel enclosures lean toward stainless, they emphasize that cold-rolled steel products can do an excellent job if properly maintained. The primary job of any enclosure is to protect the sensitive contents within.

"In a situation where you have a computer system controlling satellite controllers, the satellites and their necessary components would definitely need to be enclosed," says Malkin of Rain Bird. "And I would certainly recommend an enclosure in any situation where you're using moisture sensors, rain sensors or any other sensors with circuitry back at the controller."

Moore believes the balance between aesthetics and armor is achievable.

"From an exterior point of view you don't want something obtrusive," she concludes, "but you do want to select an enclosure that says, 'You really don't want to get into this, and if you try, you're going to have a very hard time.'" ❑