

## INSTRUMENTATION ENGINEERS AND CONTRACTORS

### Environmental Monitoring Systems (EMS)

By Mike Kornas

**A common practice for many years has been to qualify a building automation system (BAS) as a whole or in segments.** With increasingly strict regulations and demands in industries that include pharmaceuticals, health-care, data centers, etc., many Omni clients are opting to monitor individual critical points through a separate environmental monitoring system, or EMS.

The purpose of an EMS is to capture and record critical values such as temperature, humidity, pressure, level and flow, critical alarms for freezers, walk-in boxes, process equipment, and the like. By individually monitoring and analyzing critical points, testing and validation are streamlined for qualification. Comprehensive trending and performance data is readily available and archived for future reference. Sensitive areas and materials are safeguarded by warnings and alarms when crucial parameters approach or exceed limits.

An EMS system is only as good as the instruments capturing the data, so users should always opt for highest-quality instruments such as Vaisala temperature and humidity transmitters and Setra pressure transducers and sensors. Superior quality splitters should be used as well when splitting a signal to BAS and EMS.

**EMS instruments require regular calibration and should follow a strict calibration protocol.** As with any critical system, an EMS should be protected with an uninterruptible power supply (UPS). Verify that equipment being monitored is backed up by UPS as well.

Omni Instrumentation designs, installs, and services environmental monitoring systems and provides three-point instrument calibration. To learn more, contact Mike Kornas at 908-412-7130.

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## OMNI TECH TALK: How Do Particle Counters Work?

In clean environments, contamination is typically controlled through proper filtration and preventing the introduction or generation of new particles. But to ensure these measures are working, highly-sensitive particle counters must be used to continuously monitor the air and alert personnel when excess particles are detected. Not only do these devices prevent particle contamination and increase productivity, they help personnel understand its causes and employ corrective measures.

**Optical particle counters (OPCs) are the type most predominantly used for cleanroom monitoring, verification and testing, and to monitor filter efficiency.** An OPC uses a small pump to draw ambient air into a chamber. As the air passes into the chamber, it is illuminated with laser light, causing the particles that are present to reflect light, or "scatter". A highly sensitive photodetector captures these flashes of scattered light and converts them to individual electric pulses that correlate with the size of the particle. These pulses are then analyzed, measured, counted, and converted into data. If acceptable particle limits are breached, facility personnel are alerted by audible and/or visual alarms.



To learn more about particle counters, contact Omni at 908-412-7130.

### TECH TIDBIT: Megger Testing

**A megger test is used to verify the integrity of cable insulation on wiring and motors using DC voltage as part of a commissioning effort.**

As a standard, customers should require megger testing for all feeder circuits and motors, especially in new installations. Failures often occur when megger testing is overlooked, as is frequently the case, so this simple, straightforward procedure should never be neglected.

### The OMNI Safety Corner

**Safety is our #1 priority.** As part of our continual commitment to training, compliance, and improvement, we updated our safety manual for Spring 2013.

Omni has participated in numerous OSHA VPP projects, and we are ISNetworld approved.



## FROM THE PANEL SHOP: Breaker Reconditioning By Craig Drabyk

**Circuit breakers have a finite life expectancy, and aging can be accelerated by environmental and utilization factors, although regular maintenance can delay the aging process and prevent costly downtime.** Once breakers have reached their limits, however, replacement is not the only option. Breaker reconditioning can provide an effective and highly economical solution.

**Near-original factory condition can generally be restored when performed by a reputable company like Omni.** Breakers are disassembled, and individual components are thoroughly cleaned, checked for wear, refurbished, and replaced if necessary. Once reassembled, reconditioned breakers are tested, calibrated, and certified to meet or exceed industry standards. Clients can also purchase reconditioned breakers for installation into existing gear.

Circuit breaker reconditioning is an excellent alternative to pricey breaker replacement. If you are interested in breaker reconditioning services, please contact Omni at 908-412-7130.



## Communication Protocol Should Not Be an Afterthought



**It is customary for design drawings and sketches to include electrical connections such as power, basic control, UPS, etc., but a specific communication protocol is oftentimes not identified.** This can result in a jumble of equipment and systems that must be integrated at the end of a project.

It is important to select a protocol early on, and purchase equipment and hardware accordingly, to avoid unnecessary communication complications that can cause project delays. Project team members should agree upon a communication protocol prior to any equipment purchase, including long-lead items that are often overlooked. How will VFDs, boilers, chillers, substations, and other large equipment communicate

and relay information? Modbus, or BACnet? MTCP or IP? Integrating a mismatched hodgepodge can be a time-consuming challenge, but when equipment and hardware are selected based on a common protocol, proper communications can be established with little to no difficulty.