

INSTRUMENTATION ENGINEERS AND CONTRACTORS

A Peek Inside -

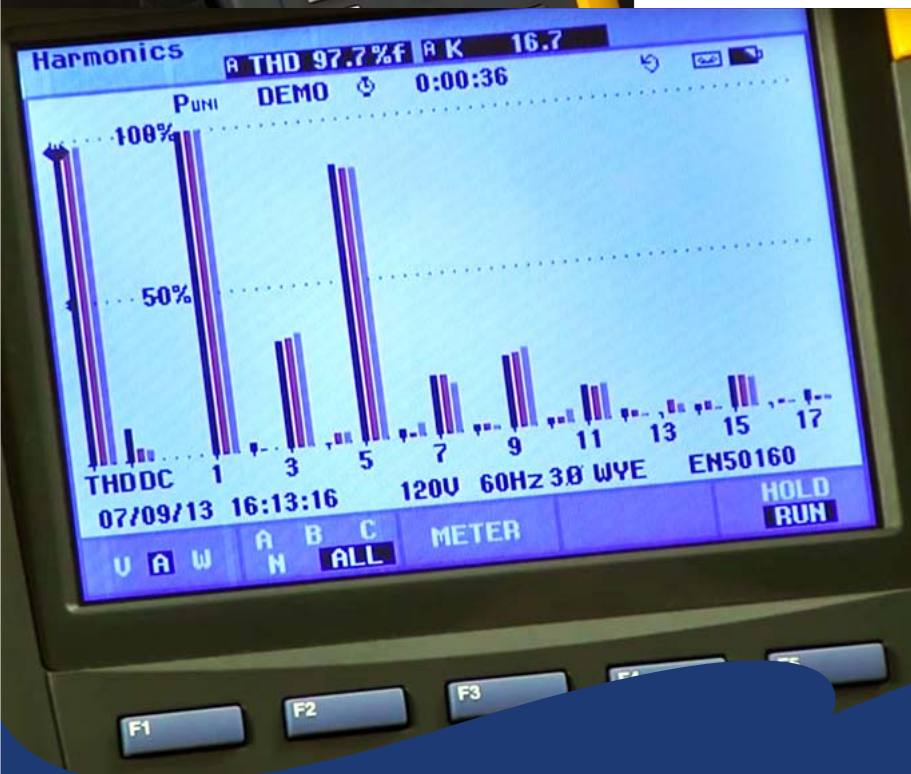
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HARMONIC DISTORTION

Harmonics is a problem that can severely alter the quality of power delivered to electrical systems and can cause damage, disruption, or failure of electrical equipment. Harmonic distortion is largely an “invisible” problem that is not widely understood among facility personnel, but its growing impact on equipment and operations makes it a pressing issue requiring an increased depth of knowledge and expertise.

Harmonic distortion is created by electronic equipment drawing nonlinear loads. In years past, when current drawn by most electrical equipment was linear, or sinusoidal, in shape, harmonics was rarely an issue. Today, however, virtually all electronic equipment in commercial and industrial buildings utilize power conversion technology that draws current in short, abrupt pulses that create distorted, nonlinear waveforms. These nonlinear waves produce reflective, or harmonic, currents that flow back into the power distribution system, degrading power quality. Equipment and devices drawing nonlinear loads, and therefore susceptible to harmonics, include computers, servers, monitors, copiers, printers, telecom systems, fluorescent and LED lighting, medical and lab equipment, VFDs, UPS, etc.

Most buildings can manage nonlinear loads of up to 15% of the total system capacity, above which a number of troubling issues can occur due to harmonics. These include overloading of neutral conductors, overheating or failure of transformers, nuisance tripping of circuit breakers, computer malfunction or lockup, flickering or blinking of lights, electronic equipment shutdown, overheating motors, voltage drop or failure, and power interference on voice communication. Severity can range from annoying to costly (equipment failures) or dangerous (fires due to overheating).



OMNI TECH TALK: Electrical Commissioning

Electrical commissioning has not kept up with advancing building technologies

Anyone who's been involved in a large construction or building renovation project is aware of the importance of commissioning. Most commissioning efforts prioritize HVAC – air and water balancing, BAS point-to-point check, basic sequencing, etc. – as well as fire alarm systems. On the electrical side, commissioning has traditionally been very basic, included such items as continuity check, megger testing on panel feeders, and emergency lighting. But while HVAC commissioning continues to evolve as new systems and technologies are developed, the electrical commissioning process has lagged behind, with commissioning agents still following outdated checklists. The result? Multiple problems, contractor callbacks, and unhappy clients.

Today's electrical startup and commissioning approach should encompass all electrical systems and their interface points and should be conducted by a knowledgeable contractor who knows the functionality of the full range of low voltage systems. A good commissioning document should include systems such as electrical and utility metering, lighting control and daylight harvesting, IT/AV, DAS and WAPs for cell phones and Wi-Fi, shade controls, sound masking, and various other monitoring systems. If commissioning documents don't include all of these electrical systems, a good electrical contractor like OMNI can help develop them to avoid the inevitable problems, delays and finger-pointing.



OMNI Welcomes CHRIS WAGNER

Omni is pleased to announce that Chris Wagner has joined our team as **Project Manager**. Chris comes to us with vast experience in all facets of process instrumentation installation and calibration, having served as Director of Business Development for Instrument Sciences and Technologies, Inc. (IS&T) for the last twelve years.

In addition to securing numerous multi-million dollar projects and developing and maintaining business relationships, Chris was heavily involved in project management as well as process design / engineering in industries that include petrochemical, power generation and pharmaceutical manufacturing. Please join us in welcoming Chris to the Omni team.

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FROM THE PANEL SHOP: Where To Put It All

One of the more pervasive challenges on new construction and renovation projects is figuring out where to put all of the control panels. Project coordinators are constantly faced with having to “shoehorn” panels into spaces that are not big enough to accommodate them, leading to headaches and project delays all around.

Technology is ever-expanding to new building systems, resulting in more control panels that need to find placement. Not long ago, electrical rooms typically contained basics like transformers, electrical and UPS

panels, fire alarm systems, and security panels. Now, these same spaces are expected to contain an additional array of control panels that may include lighting, daylight harvesting, sound masking, digital antenna systems (DAS), wireless access points (WAP), shade controls, etc., while meeting NEC clearance requirements. Almost invariably, panel placement is not included on original design drawings nor on project 3D modeling, and additional panel space for existing systems and future expansion is seldom provided. Oftentimes, the intention is to install these panels in IDF closets or MDF rooms, which usually are already jam-packed with equipment, making accommodation difficult.



The solution to this problem is for each contractor to provide control panel quantities, dimensions,

and power requirements to the project coordinator as early on in the project as possible. Wherever possible, future expansion needs should be identified up-front as well. Inclusion of this information in the model benefits the owner, the project coordinator, and contractors, not to mention the project budget and schedule.

Selecting A Temperature Transmitter

Temperature sensing and measurement is the most widely-measured process variable in industry, and manufacturers have created countless unique application-specific temperature transmitter options to fill every need. With the wide variety of transmitters available, users must pinpoint their needs for their particular application. Many factors must be considered: distance, accuracy, stability, noise, and environment, to name a few, as well as digital protocols such as Foundation Fieldbus, Hart or Profibus. Many instruments have intelligent diagnostic capabilities that can alert you to problems and their causes.

Omni has extensive field experience in a myriad of applications and can help in the complicated process of choosing the best temperature transmitter. Please call us at 908-412-7130 for more information.

