

TECHNICAL UPDATE - TU-4008

SUBJECT: Installation of CEM Umbilicals in Raceways

A recent article brought up some questions regarding the National Electric Code Articles and how they relate to Continuous Emissions Analyzer bundles.

This article pointed out that Article 300-8 of the NEC states “Raceways or cable trays containing electric conductors shall not contain any pipe, tube, or equal for steam, water, air, gas, drainage, or any service other than electrical.

This statement was put into the 1990 revision of the NEC to eliminate the problems encountered when electrical raceways were cluttered with steam, gas, water, and/or other services. Problems such as electrical line shorting out when steam lines developed a leak.

In most applications, this is no problem. The CEMS system and associated sample lines are usually designed and laid out after the other services are put into place. Analyzer and sensor location usually do not lend themselves to routing sample lines through existing raceways. So separate raceways are the rule.

In retrofit operations, there is a push to use existing structures and raceways in an effort to save installation time and cost. The CEMS system coordinator must require that the installation meet NEC and local codes.

Unitherm does not recommend the installation of analyzer umbilical lines in any raceway containing any other service. Multiple analyzer umbilicals can be installed in the same raceway if proper bundle spacing is maintained. The spacing is detailed in Unitherm installation documents, including drawing number 0419-17000 and the CEM installation manual.

Occasionally there is a question whether the umbilical, with its tubes heaters, and control wires, is in violation of Article 300-8. The answer to this question is “no”. Article 300-8 deals with wiring methods. An analyzer umbilical is an integral part of the analyzer equipment. It’s sole function is to carry samples and provide control and support from the analyzer unit to the probe. As such, it is exempted from the rules in Article 300 by Article 300-1(b). This interpretation of the NEC has been accepted in thousands of CEM installations worldwide. This industry acceptance indicates to us that the Code requirements have been met.