

# New Instrument Requirements Lists Define Range, Accuracy, Resolution and More



**Don Fedyk | NEBB Technical Director**

Designers and manufacturers call them instruments but to Certified Firms, Professionals, and Technicians they are “tools.” These “tools” have changed dramatically from basic thermometers and gauges to sophisticated high-tech multiple-use instruments designed to meet the requirements of modern environmentally friendly building systems. Instruments like the portable infrared spectrophotometer, particle counters, and photometers help verify critical safety and cleanliness for operating rooms compounding pharmacies, and laboratories. These and all tools used by the Professionals and Technicians play a critical role in allowing the user to accurately measure and evaluate equipment and building systems for a variety of buildings -- whether an office building, school, hospital, or another structure. The need remains the same even if the use may vary.

The NEBB board of directors has approved a new comprehensive instrument (tool) requirements list from the recommendations and thorough review by each of the NEBB discipline committees. The instrument requirements, range, accuracy and resolution are listed for each as well as cross-reference to which discipline or multiple disciplines to which it applies or may apply. View the new list at [http://www.nebb.org/resources/instrument\\_requirements/](http://www.nebb.org/resources/instrument_requirements/).

All instrumentation which have a NEBB calibration requirement must have a minimum three point NIST Traceable Calibration for firms in the US and/or North America. Note: Outside of North America, National Metrology Institutes exist in many countries maintaining primary measurements of standards, such as NPL in the UK, NIST in the United States, PTB in Germany, and many others which are approved for those regions and are required for instrumentation in those areas.

Each of the NEBB Procedural Standards have been updated by corrigenda for the instruments or in some cases where new Standards are being published such as the *Fume Hood Testing Procedural Standard, Second Edition*, already contain the new requirements as do the new ANSI Standards S120-2016 Rev. 1 and S110 Draft 2 which are currently under review.

Some of the changes affect multiple disciplines while others are discipline specific like CPT or FHT. A synopsis of the major changes is described here but it should be noted that Certelligence instrumentation lists (pull-down menus) have been updated to include approved instruments in each of the categories. While the lists are updated periodically and are extensive, they are not all-inclusive and may not contain all instrumentation that meet the requirements. Any instrument not on the list but meeting the conditions of the specific standard requirements should be added as “other” along with data specifications in the documentation/ photo upload for review by the chapter. All approved instruments will be added to the updated list. Any instrumentation questions should be addressed to the chapter for resolution.

Some of the instruments commonly used by multiple disciplines that have undergone requirement change include:

1. **Air Volume Measurement** – Balancing hood requires digital instrumentation which does not allow the use of an analog instrument due to accuracy and resolution.
2. **Temperature Instruments** – Whether for air, contact, or immersion there is a change in the range, accuracy, and resolution. The instrument may be the same for all three with varying probes for the differing requirements.
3. **Rotation Measurement** – The requirement was changed to reflect a moderate basic range starting at 60 rpm.

4. **Hydronic Pressure Measurement** – Combined three separate range requirements into one basic criterion reflecting the new instrumentation available.
5. **Hydronic Differential Pressure Measurement** – Combined three separate range requirements into one basic criterion reflecting the new instrumentation available.

While most of the changes in the instrumentation do reflect minor “tweaks,” a few major changes affect either a specific discipline or affect a few disciplines as the does the change from renting to ownership of sound instruments impacts the Sound Measurement (SM) and Special Electrical Cx. Since the availability of instruments to perform sound testing and calibration has increased while costs decreased dramatically, the ownership of the instrumentation for sound measurement does not present any undue hardship on the firms performing the task. Increased NEBB training at both the CT and CP level as well as more specifications requiring the SM necessitates knowledge and availability of the instrumentation to perform the tasks. This fits the NEBB model of ownership, knowledge, and proper usage of the instrumentation for a specific task.

Cleanroom Performance Testing has modified the instrumentation requirements for that discipline to reflect the field testing being performed in the various types of cleanroom environments. While the basic instrumentation requirements for airflow, pressure and particle counting remain the same, the methodology for leak testing depicts actual conditions, whether use of photometer or scan testing for compliance. Fume Hood Performance Testing instrumentation is per the ANSI standard for Fume Hood Performance Testing with the minimum range, accuracy, and resolution per that requirement.

One of the highlights of the new instrument requirements matrix is that it allows the user to virtually compare the requirements of multiple uses or disciplines in a single location to minimize costs and maximize efficiency with the ability of using a specific instrument for multiple functions and/or disciplines. The specifying of ranges and accuracies into more representative values that conform to the actual practices of the discipline reduce unnecessary costs or lessen the difficulty of obtaining instrumentation.

As previously mentioned, “tools” have evolved into highly sophisticated instruments with multiple functions and increased range accuracy-resolution meeting the more stringent requirements needed to test and verify the environmentally efficient buildings of today. Testing including Retro-Commissioning of Existing Buildings as well Commissioning of New Buildings requires the properly trained Certified Professionals and Technicians using calibrated instrumentation to perform tasks correctly and efficiently. NEBB, through its various Standards and educational opportunities, strives to provide individuals and firms with knowledge and validation through the Certification programs to afford their clients a project completed efficiently and with integrity. The instrumentation is only one of the many parts of the NEBB program. ■