DRANETZ
THE STANDARD FOR ENERGY & POWER MEASUREMENT

APPLICATION NOTE

DranXperT and NEC 220.87 Load Studies

INTRODUCTION

The National Fire Protection Association (NFPA) publishes NFPA 70, the National Electric Code (NEC). The NEC is the US reference for the safe installation of electrical systems. Although the NEC is not mandated by the US federal government, most states and/or municipalities in the US require compliance with NEC requirements.

NEC article 220 is for branch circuit, feeder, and service calculations and section 220.87 covers the requirements to determine existing loads. Compliance with NEC 220.87 is a requirement to determine available capacity when adding loads.

NEC 220.87 REQUIREMENTS

NEC 220.87 states that it is permissible to use the actual maximum demand when determining existing loads, but there are conditions.

The first condition is that the maximum demand data is available for 1 year. Practically speaking, unless the facility has existing branch circuit or other monitoring, 1 year of demand data may only be available at the utility service from utility billing.

There is an exception if maximum demand data is not available for 1 year - the calculated load can be measured at the feeder or service. Such a measurement requires a minimum 30-day load study by a power logger measuring the demand averaged over a 15-minute period. The load study must be taken while the space is occupied and include measurements or calculations of the heating and cooling equipment (whichever is larger). Refer to NEC 220.87 for specific details.

Another condition is that 125% of the maximum demand plus the new load does not overload the circuit. The requirements for overload protection are covered elsewhere in the NEC.

DRANXPERT AND NEC 220.87

DranXperT is a low cost, general purpose power & energy logger. DranXperT is a versatile tool that is ideally suited to measure the 30-day maximum demand recording requirements of NEC 220.87. Upon completion of the survey, the included Dran-View XP software can quickly and easily show the maximum demand and/or amperage measured during the (minimum) 30 day recording.

Figure 1. Typical DranXperT kit

CONFIGURING DRANXPERT

Configuring DranXperT for a NEC 220.87 load survey is simple, and the settings are virtually identical to any other load study. It is important that you do the following to meet the requirements of NEC 220.87:

- On the *Survey Setup* page set the *Demand Interval* to 15 minutes and the *Journal Interval* to 900 seconds (15 minutes). Doing so will program DranXperT to record the 15-minute average information required by NEC 220.87.
- On the *Instrument Setup* page make sure that the *Max DB File Seconds* setting is set to the default of 31 days (or longer). This will meet the requirement of a minimum 30-day survey, and the data will recorded in one data file.

Please refer to the DranXperT Quick Reference (QR) guide for further setup information.

DETERMINING THE MAXIMUM DEMAND

Determining the maximum demand or amperage is as simple as loading the data file into Dran-View XP (or Pro & Enterprise) and reading the maximum values for demand and amperage directly off the 30+ day trend plot. See the circled areas in the trends below:

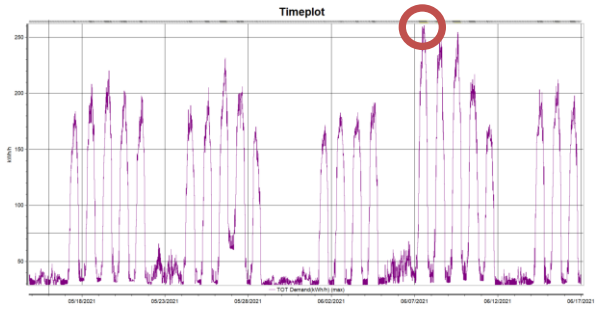

Figure 2. DranXperT 30-day demand trend

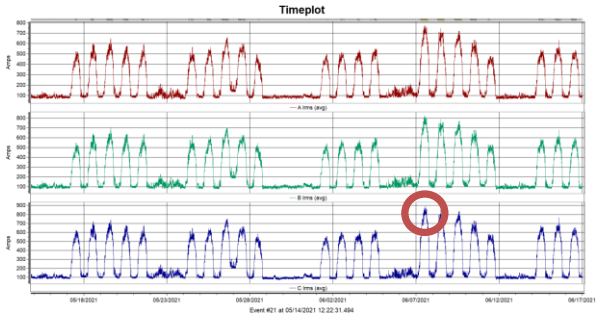

Figure 3. DranXperT 30-day 3 phase amperage trends

In the above, the maximum demand and amperage occurred on June 7, 2021. The maximum demand was 260Kw and the maximum amperage was 891A on phase C. This is the information required to determine the available capacity for additional loads.

Please refer to the DranXperT Quick Reference (QR) guide for further information about transferring the data from DranXperT to your computer or other information.

CAN OTHER DRANETZ PRODUCTS MEASURE TO NEC 220.87?

Yes! DranXperT is a low-cost solution that is ideally suited for NEC 220.87 and other applications. However, if you also have power quality monitoring needs, Dranetz PQ monitoring products, such as the Dranetz HDPQ family can easily make the measurements required by NEC 220.87.

TO CONTACT DRANETZ

- Call 1-800-372-6832 (US and Canada) or 1-732-287-3680 for Technical or Sales support
- To submit a support request online, please visit: https://www.dranetz.com/technical-support-request/