

Duty Cycle Measurement / Data Logging

Here at Energy Control Equipment, we use our in-house-designed Duty Cycle Analyzer (DCA) to determine the cooling/idle times ("Duty Cycle") for a cooled chamber. (Remember - the "Duty Cycle" as used on the Spreadsheet is NOT the compressor duty cycle - it is the on/off cycle of the thermostat/solenoid valve circuit).

Our DCA has a non-resettable elapsed-time meter which runs when the room is being cooled (current flowing in the thermostat-solenoid valve circuit), and stops running when the room cooling stops (solenoid current stopped). The elapsed-time meter has .1 hour (6-minute) resolution.

To use our DCA, one first records the beginning number on the meter, and the time/date of the beginning of the test, and then sets the DCA to monitor the thermostat-solenoid valve circuit.

Usually we monitor for a period of one week, to allow the refrigerated chamber to experience all the possible variations in its operation. At the end of the week, we return, disconnect the DCA, and record the ending number on the meter, along with the time and date of the end of the test.

We calculate the total Monitoring Hours, by using the start and end time/date data. Then we determine the total Cooling Time by subtracting the ending meter number from the starting meter number. Dividing the Cooling Time by the Monitoring Hours and multiplying the result by 100 gives the Duty Cycle percentage.

Our DCA was specifically designed for this Duty Cycle measurement, but other types of Data Loggers may also be used. A recommended commercial logger is the Supco LOGiT LCV data logger. It is relatively inexpensive, is designed to record current and/or voltage, and can record up to two weeks of samples. It does require a special interface cable and software to download and interpret the data, making it a bit more complicated to use than our DCA.

Undoubtedly, other inexpensive loggers (such as the SMARTlogger™ Time-of-Use (TOU) Monitors) could also be configured for Duty Cycle recording and analysis. However, all commercial loggers require a program, a cable, and some analysis to process the recorded data. The DCA does not need any external hardware or software to perform its function.