

Industry Standards Downloadable Guides

Duty Cycle Explained

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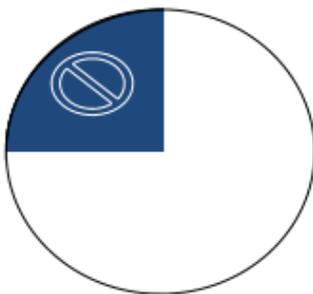
DUTY CYCLE

Duty cycle is the proportion of time during which a component, device, or system is operated. The duty cycle can be expressed as a ratio or as a percentage. Suppose a disk drive operates for 1 second, then is shut off for 99 seconds, then is run for 1 second again, and so on. The drive runs for one out of 100 seconds, or 1/100 of the time, and its duty cycle is therefore 1/100, or 1%.

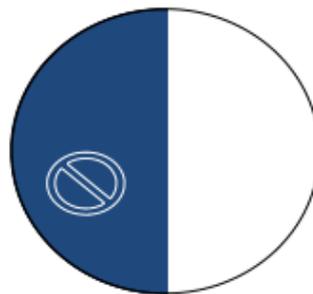
The more a circuit, machine or component is used, the sooner it will wear out. Therefore, the higher the duty cycle, the shorter the useful life, all other things being equal. If the above-mentioned disk drive has a life expectancy of 1,000,000 hours based on a 1% duty cycle, that same device's expectancy would probably be about 500,000 hours based on a duty cycle of 2%, and 2,000,000 hours based on a duty cycle of 0.5%. Duty cycle ratings are particularly important when using an electric actuator for modulating service.

When a unit is in modulating service, it is possible for it to be continuously making corrections to the valve position as the process demands. In this case it would be important to have a unit with a 100% duty cycle. However, it is unlikely that the movement would be more than a few degrees as generally only minor changes are required once a set point has been reached. This explains why actuators with a duty cycle of less than 100% can be modified to modulating duty. A unit that is in open/close service and would remain in either open or closed position for extended periods of time would not require the 100% duty cycle as the valve position is not continuously being corrected and a reduced duty cycle may be adequate. Graphical representation:

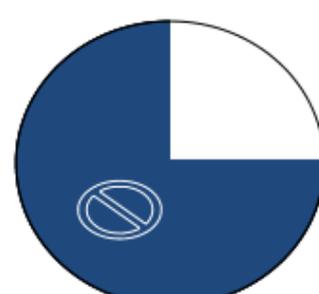
Graphical representation:



25% DUTY CYCLE



50% DUTY CYCLE



75% DUTY CYCLE



= Motor running



= Motor rest time