

RESPONSE TIME AND CORRECTION TIME

General

Customers must be aware of the difference between response time and correction time in order to understand and compare the specifications put out by the different power treatment manufacturers, and evidently get the best product for their application. The first factor that needs to be understood is response time and correction time are not the same thing. Response time is the amount of time it takes a transformer to acknowledge a deviation in its operation. Correction time is the time it takes the transformer to correct that deviation once it has been recognized. Two different transformers may have the same response time, but different correction times. For

example, you are driving in the woods full of wildlife enjoying the peacefulness of the country. When all of a sudden a deer jumps into the road right in front of you. You acknowledge the fact that you will hit the deer if you don't slam on your brakes. This is the response time. The correction time is the amount of time it takes for you to apply your foot on the brake pedal and bring the car to a complete stop before hitting the deer. As you might imagine, the correction time varies with the type of car you are driving, but your response time doesn't change. Fast correction time is important, but so is the method in which the transformer corrects the deviation. A very

quick, sharp voltage correction has detrimental effects on the equipment being protected. You wouldn't want your brakes to stop the car the very instant you apply them, or you would be going through the windshield. A quick but smooth correction is the most desirable one. That way the problem at hand is corrected quickly and gently with no detrimental effects to the equipment.

Some manufacturers list only the response time misleading the customer into thinking this is actually the correction time.

Voltage Fluctuation

Sensitive electronic equipment have tight voltage tolerances in which they are able to function properly. If voltages are allowed to fluctuate outside their

tolerances, the electronic components are prone to failure. Voltage will fluctuate on the incoming power lines to buildings, and from large load changes to the power

quality equipment. For this reason, quick but smooth correction time is required.

Power Purifier

Because of its ferroresonant technology, the *Power Purifier* corrects voltage fluctuations from the input to the output instantaneously. The load will never see

the offset voltage (unless it is outside the regulation specifications). In going from no load to full load, or vice-versa, the output voltage can change +/-10% and

be corrected gently with a smooth transition back to nominal in less than 3 cycles without risking the protected equipment.

Other Technologies

Motor driven voltage regulators have a quick response time but slow correction time. Typical step changing systems have very quick

response time, but may have a very long correction time. These systems do nothing for voltage fluctuations until the voltage

changes +5% / -15% of nominal. Once the voltage reaches this level, it is brought back to nominal in one quick step.

Summary

Both the response time and the correction time are important in obtaining a smooth error-free operation. Most regulating devices have fast response times, but

the correction time varies among the different technologies. Motor driven voltage regulators have slow correction times, typical step changing transformers have

delayed correction time but the actual correction is fast and extreme. The *Power Purifier* has quick yet smooth correction time.



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