Digital Control of Thyristors Bridges[1]

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Abstract

In this paper, a theoretical study is done, and practical execution for a three phases, digitally controlled, multi-purposes, thyristor bridge is illustrated. and built this system as a laboratory type, easy to trace its every part.

The basic concept of this method, is to produce a high frequency, from the multiples of the mains frequency signal, and synchronized with it, in a way that it produces 256 pulses in every half cycle of the mains frequency. The desired value of the shifting angle of the triggering pulses, is given digitally as a number between 0-255 , which is equal to phase shift angle between 0-180º degree, and stored to be compared with the output of the synchronized counter. When this output exceeds the desired value of the phase shift angle, the pulses of the first bit of the counter is released and processed to trigger the thyristor through a pulse transformer. the digital value of the desired phase shift angle was taken from the parallel port (LPT) of the personal computer,(printer output), using a program made especially for this purpose. the results of operating this system showed the accuracy, fast response, and the flexibility of reforming any desired thyristor circuit.

The design of this digital system was developed to control 256 output, and a15 output controlled system(theater lighting)

was executed, and made a special program to control, and tested the second system, results obtained shows the flexibility of the system .

Key Words : Power Electronics -Thyristor Bridges – Control of Thyristor Bridges – triggering pulses – Database

[1] For the paper in Arabic see pages (87-121).

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