EUROTECH
DIGITAL POWER ENGINEERING

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How to build a first stabilizer using
a Smart Digital Power Module

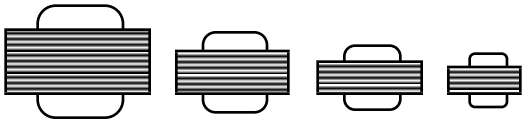
For the engineer

Get some ultra fast semiconductor fuses, current value as the stabilizers output.
Manufacturers are Bussmann, Siba, Westcode, Littlefuse and others.

Prepare four transformers with standard EI cores. Voltage ratios must be precise.

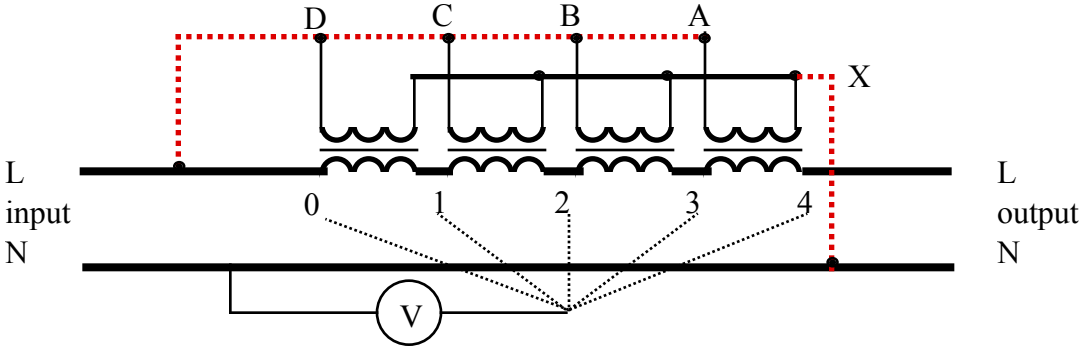
Primary coils must be for 230V.
Secondary coils must be for four different voltages:

D: 22.4V
C: 11.2V
B: 5.60V
A: 2.80V



Example for a first test stabilizer:
Make the secondary coils for a current of 25A. This makes a stabilizer for an output of 20A.

Connect transformers as shown below. Primary coils are shown on the top.
Dotted red connections are for temporary phase direction tests only.

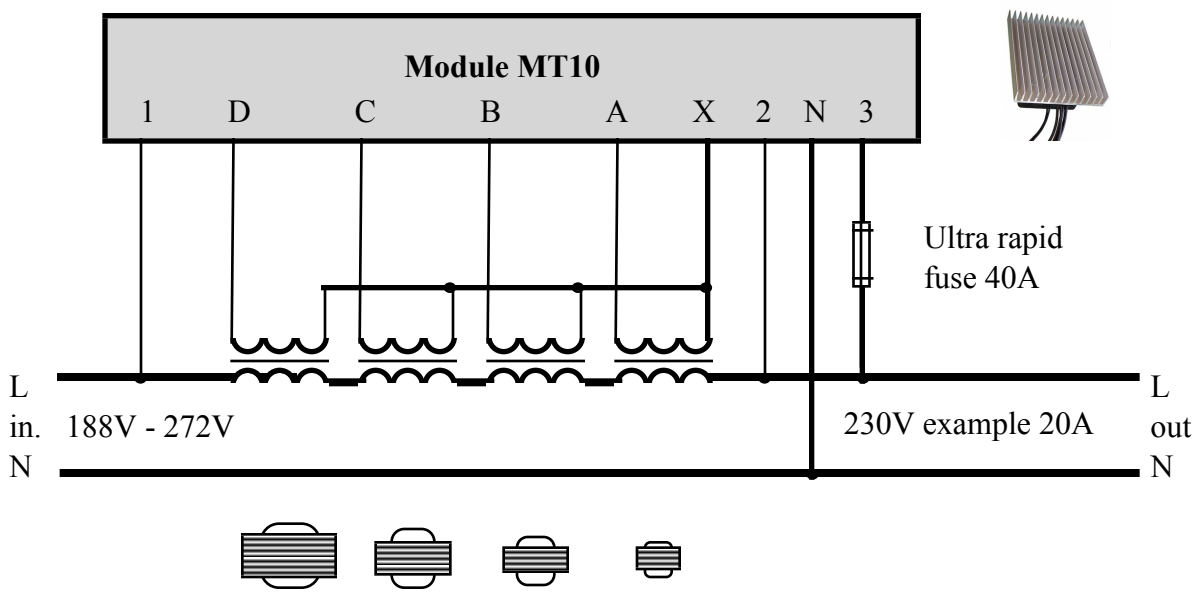


Apply 230V to the input. If the output is 42V lower, remove dotted wires and go to the next page.

If not:

The voltage on 0 must be 230V to Neutral.
The voltage on 1 must be 0 minus 22.4V. Swap the primary wires if not.
The voltage on 2 must be 1 minus 11.2V. Swap the primary wires if not.
The voltage on 3 must be 2 minus 5.6V. Swap the primary wires if not.
The voltage on 4 must be 3 minus 2.8V. Swap the primary wires if not.

Mount the module MT10 vertically for best cooling.
Make sure air can move freely across the cooling fins.
Connect:



Use an ultra fast fuse. A standard fuse or no fuse may destroy a module.
Check connections before turning on. Use quality connector terminals only.
If switches, use quality spring-loaded ones only.

Use a Variac for tests on the input side.
Measure input and output voltages continuously.
Best is to have also a lamp connected to the output to see the correction speed.
If wanted for demo purposes, connect a 230V lamp each in parallel to the four primary coils.

Set Variac to zero volt. Turn on. Turn up the variac output.

At an input voltage below 150V the transformers will conduct the input to the output.
At an input of about 160V, the stabilizer will activate, all four transformers will add their voltage.
At an input voltage between 150V and 188V the transformers will add <42V.
4. At an input voltage between 188V and 272V the output will be 230V.
5. At an input voltage between 272V and 300V the transformers will subtract >42V.
Maximum input voltage is 300V.

Apply a load of up to 20A = 4.6kW:

The efficiency of a module is 99.7%. The module will remain cold when no load is connected and will get warm over a long time at full load. About 15W is generated as heat at an output of 20A.

Standard modules sample and change if needed transformer settings every 640msec.
Faster versions are for 320 and 160msec.
Faster versions require special transformer cores.