# A. T. M. S.

Proven Advanced Technology Solutions

## MVB Dynamic Voltage Booster

by Magtech

- Stabilises the correct voltage for each phase individually.
- Corrects voltage unbalance between phases
- Much increased single phase short circuit current
- Rapid response (100 msec.)
- No moving parts
- Long life
- Very low maintenance
- Quick installation
- Self-adapts to any site
- 500 + units in use

The **MVB** is installed to alleviate the problems of voltage drop and fluctuation on long feeders. The **Magtech** patented « Controllable Inductance » technology used in the magnetic circuits modulates the boost of the voltage level dynamically according to the varying load to hold the voltage at the correct value for each phase and also to correct any unbalance between the three phases. The exemplary reliability and long life of the sealed system (25 yr) is due to the absence of any moving parts except the cooling fan, and the system's adaptability means that it is functional immediately after installation. In the event of a single-phase short circuit, the unit draws power from the other phases to give a higher current and blow the protection fuse much quicker for greater safety. The **MVB** is not itself affected by short circuits, and restarts automatically when the fault is cleared. It establishes a by-pass if there is a fault or the supply goes out of limits.

Managing an electricity distribution network is inevitably a compromise between the cost of the equipment installed and the quality of the supply. For long feeders, the investment necessary to ensure the correct and stable voltage for the most distant consumers is often considerable and difficult to justify, both in the short and long term. The dynamic **MVB** system is used as a permanent solution in many cases, although its flexibility means that the same unit can be installed temporarily at successive sites, to each of which it self-adapts, making it much easier to plan the modification and evolution of a network, whilst ensuring supply quality for all the consumers. The ease of installation, long life and almost zero maintenance of the **MVB** makes it clearly the lowest cost and most efficient solution to the problem of voltage drop and unbalance.

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**Operation** - The increasing use of larger single-phase loads coupled with the increase in overall consumption inevitably causes excessive voltage drops and fluctuations for many customers. The **MVB** is installed upstream of the affected consumers in order to ensure a stable supply for them. It modulates the voltage by an « Auto transformer », with continuously variable inductance.

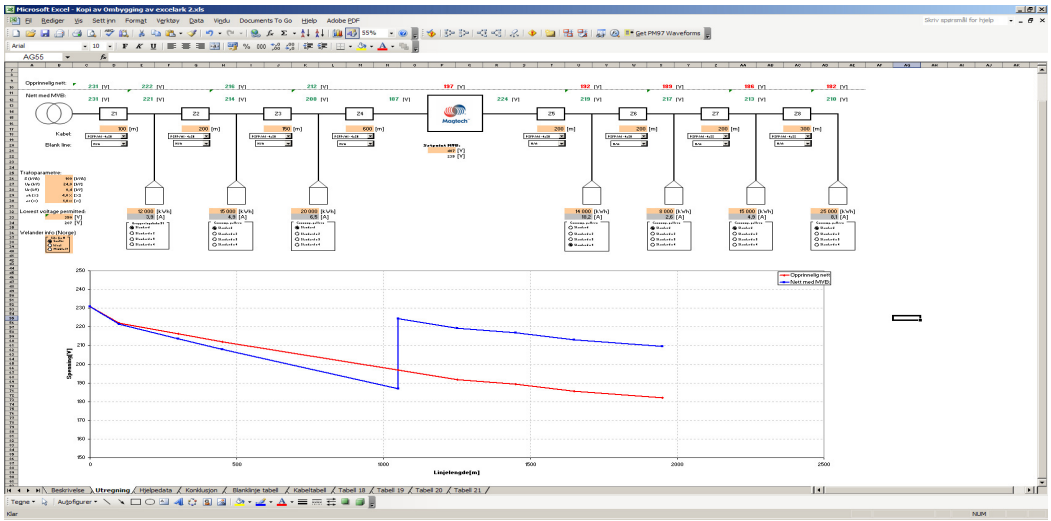
This variation dynamically changes the coupling between the primary and the secondary, with a response time of 50 to 200 msec. This is done very efficiently (>96%) and independently on each of the three phases. With this advanced technology, there are no moving parts except the cooling fan, as there is only copper and iron in the power circuits, and the electronic control circuits are both conservatively rated and analogue, so the design life time of 25 years is assured and there is no software to develop bugs or need updating.

In the event of a single phase short circuit, all three phases collectively deliver a higher current so that the fuse or circuit breaker reacts more rapidly to give greatly increased protection. The unit is protected from overvoltage by internal (and if necessary external) surge arrestors.

There is a by-pass connection which can be operated manually and is automatically closed when the output voltage cannot be held within limits, or if the unit overheats. The system reverts automatically to normal operation once normal conditions are restored.

The cooling fan circulates the air internally, so there is no opening to atmosphere, and there is a heat shield to protect the control module from solar heating.

Whether used as a “quick fix” for a voltage sag problem until the network can be modified, or as a permanent solution to a long term problem, the **Magtech MVB** is an excellent means of reducing and/or delaying investments into the evolution of the distribution network.



Left—A free software program running in Excel is used to establish the optimum position for the installation of the MVB

Technical Characteristics :-

Stabilised Voltage output 235 Vac
Voltage Lift up to 15% for balanced loads, 28% for unbalanced loads
Total Harmonic Distortion less than 6%.
Efficiency > 96%, No-load loss 200 watts for MVB70, 340 watts for MVB160.
Power Factor >0.98 THD <6% at full load.
Cooling by closed oil circuit.
Independant regulation of each phase tolerates 100% unbalanced load and maintains the voltage.
Single phase short circuit current increased by a minimum of 60%.
**Standards applied - EN 50160** and **IEC 61000-3-4**

The **Magtech MVB** models

| Model | Phases | Voltage | Continuous Pwr. | Max. 6hrs. | Weight | Dims. Cm. |
|---|---|---|---|---|---|---|
| MVB70-400 | Three | 3 x 400V star | 30 kVA, 40A | 50 kVA 70A | 390 kg | 75 x 92 x 54 |
| MVB160-400 | Three | 3 x 400V star | 70 kVA, 100A | 110 kVA 160A | 750 kg | 100 x 119 x 65 |
| MVB250-400 | Three | 3 x 400V star | 112 kVA, 160A | 170 kVA 250A | 750 kg | 100 x 119 x 65 |

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