

# WHY CHOOSE POWERSTAR HV MAX?



**Powerstar is a fully integrated system with voltage optimisation coupled together with the HV transformer all on the HV side.**

The Powerstar HV MAX system can be manufactured from 300KVA to 3000KVA. The HV MAX unit can also manage an input voltage of up to 38KV primary to 690V secondary.

In addition to the high efficiency HV transformer we package the optimisation dynamic electronic controls in order to optimise the voltage on the load side.

**Utilizing the best materials such as an amorphous core to maximise savings & ROI.**

The new 2015 standards state new transformers must meet higher efficiencies than previously. Powerstar transformers exceed these standards delivering greater savings and ROI over its lifespan.

On 1st July 2015, new regulations required all HV/MV transformers to meet minimum efficiency specifications. The purpose of the regulation is to stop the installation of inefficient transformers. Stricter design regulations come into force in July 2021.

The Powerstar HV MAX has always been manufactured to the highest specification levels, which in turn means it has always exceeded the standards specifications, even those yet to be implemented in 2021.

As a result of the increased efficiency Powerstar HV max transformers produce reduced losses of 57% on transformers at no load when compared to conventional systems. Likewise, at 75% loading Powerstar HV max transformers reduce losses by 73% when compared to conventional systems.

The materials used in amorphous core transformers have high magnetic susceptibility, low coercivity and high electrical resistance.

**Why Powerstar uses an amorphous core as standard.**

The role of a distribution transformer is to convert high-voltage electricity supplied from a power station into lower-voltage electricity for safe use. Transformers operate 24 hours a day, seven days a week during which time they undergo constant losses of 2 to 4% of the electricity that passes through them.

This loss is divided into two different categories: load losses caused by the load on the transformer during the use of electricity and no load losses caused regardless of whether a load is present.

Amorphous core transformers significantly reduce no-load losses by using an amorphous alloy for the iron core, around which the transformer windings that carry the electricity are coiled.

The key to reducing energy loss lies in reducing the no-load losses and the amorphous core reduces the Powerstar HV MAX no-load loss to around one third of the losses in conventional transformers.

Combining an amorphous core HV/LV transformer with the Powerstar MAX dynamic voltage optimisation system produces consistently double digit savings with associated reductions in CO2 emissions.

## HV and LV Installations

Powerstar systems can optimise voltage on the HV or LV side. While both options will deliver savings, replacing (or specifying for a new build) an existing HV transformer with the HV MAX solution is seamless, minimises downtime and has minimum disruption to the facility.

The HV MAX flexibility of design allows us to either integrate the electronics on the same platform of the HV transformer and or mount remotely where space is limited.

Powerstar HV MAX is the only system utilizing an amorphous core HV LV distribution transformer complete with integrated electronically regulated voltage optimisation. This unique capability minimises installation costs substantially especially where access and or space limitations exist.

**Maximizing ROI by consulting with the Powerstar technical design and application team.**

Whether the Powerstar HV MAX is being mounted inside or out, ensuring discussion and analysis with the Powerstar technical team is essential.

Understanding the sites maximum demand, capacity and infrastructure have allowed us in some cases to route 100% of the load through 1 Powerstar unit (assuming a double ended installation scenario). In this example the site still has redundancy, capex is minimised and site savings are optimised improving ROI two fold.



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# HV MAX

## Voltage optimisation savings are 100% GUARANTEED

It is very important to first identify the savings opportunity on site. After many years of application experience the Powerstar application teams have developed a simple 3 step methodology which allows the end user to make informed decisions of when and how to move to the next phase of the project analysis during the process review.

IPMVP (International Performance Measurement and Verification Protocol) Part C is the standard methodology of verifying savings.

Alternate methodologies can be agreed upon with the provider & end user dependent on the specific site process or requirements.

In the event of an extremely rare case where the savings are not achieved the shortfall in terms of dollars based on c/kWh used in the proposal will be calculated.

This figure is multiplied by the payback period (ROI) as stated in the proposal and issued as a one off payment.

**Note:** Utility incentives can improve the ROI substantially. M&V is important to review with all team members as the project progresses.

## Lead time and testing requirements

Lead times are in line with the industry standard on HV transformers.

Once the site audit has been completed to verify the load profile and necessary information is retrieved and or gathered from an installation standpoint . A submittal is generated for review and signed off for production release.

Each Powerstar HV MAX system is custom designed and manufactured for every individual site application to ensure optimum savings are achieved.

## Installation & Shipping Options

Powerstar will provide the installation of the HV MAX system on a turnkey basis. If the site in question prefers to use their own specialist electrical contractor then this is acceptable as long as they have been fully trained and approved by the Powerstar in-house experts. Supervision by the Powerstar team will always be provided no matter how the contract is executed from an installation standpoint.

## FAT & Technical Support

Factory Acceptance Tests are optional and encouraged where possible.

The Powerstar team can provide in house or remote support and training on HMI programming, product support and analyzing specific site data of interest for the given facility.

## Improved ROI

The Powerstar HV MAX will always deliver savings. The question nowadays is at what cost and what is the ROI?

It can often make sense to replace the existing HV infrastructure with the Powerstar design even if there is still some years of functional operation left of the installed generic transformers. However, the ROI improves dramatically when the existing units are at the end of life or are planned to be replaced anyway.

Adding the incremental cost (Powerstar cost minus the replacement generic transformer cost) to the ROI calculation will make the financial argument in addition to the obvious technical benefits a very easy business decision that will benefit the companies bottom line quickly.

