



ACTIVE POWER FEEDER

THE EFFICIENT AND GRID FRIENDLY FEED FOR ELECTRIC ARC FURNACES

The Active Power Feeder is a highly efficient and grid-friendly technology. It enables steel production at the lowest total cost of ownership, with an exceptional power quality, all without requiring an additional compensation system.

YOUR CHALLENGE

The increased focus on eco-friendly energy and steel production presents two challenges. On the one hand, renewable energy adoption benefits the environment, but the intermittency of sources like wind and solar can contribute to grid instability. On the other hand, steel producers transitioning towards electrification to achieve sustainable production must handle the complexities of grid requirements and power quality featuring renewable power.

OUR SOLUTION

The Active Power Feeder features a high-speed electronic actuator for efficient melting. Additionally, the modular multilevel converter (MMC) supplies balanced real power from the supplying medium voltage bus to the electric arc furnace for new or existing steel plants in the most “grid-friendly” way. Here is a summary of the benefits:

- fast current control
- minimized flicker and harmonics
- improved energy efficiency
- compensation of additional loads (e.g., ladle furnace)
- eliminates additional grid furnace compensation
- enhanced arc stability
- reduced electrode consumption
- energy and maintenance cost savings
- low footprint
- flexible installation

**MORE EFFICIENT
MELTING PROCESS**

**>10X FLICKER
REDUCTION**

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Modular multilevel converters provide significant advantages in high-power applications. Its modular structure enables reliability, safety, and redundancy. Because of the multilevel output voltage, the grid interface and furnace operation can be controlled precisely with high bandwidth. Fully controllable voltages and currents lead to minimal harmonic distortion and lowest flicker values. In addition, the output frequency is variable, enabling an optimized process control.

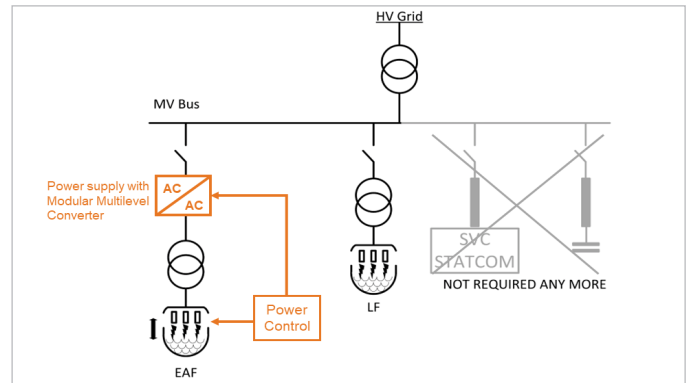
- Network friendly with greater than 10 times flicker reduction, featuring low harmonics and power factor ~ 1 at PCC (point of common coupling)
- Fast new actuator for electric arc furnace power control, i.e., high-speed control of current fluctuations and stabilization of the arc
- Ability to change the output frequency according to different melting stages
- Each phase current can be controlled individually without any negative grid impact

NEWLY INNOVATED CONTROL STRATEGIES

The Melt Expert is a next-generation process-adapted electrode control system for electric arc furnaces that automatically adjusts control parameters, improving melting efficiency and reducing energy consumption. Combined with the Active Power Feeder, Primetals Technologies offers optimized furnace control for enhanced productivity.

HIGHLY DYNAMIC CURRENT CONTROL

Our system offers fast and seamless control of arc current, addressing the limitations of overcurrent issues and significantly reducing current fluctuations. Integrating an Active Power Feeder brings various advantages, including significantly reducing flicker, decreased electrode consumption, and less stress on electrical and mechanical equipment, increasing system availability and longer “maintenance-free” periods.



Active Power Feeder supply concept

EFFECT ON POWER-ON TIME AND POWER CONSUMPTION

Increasing active power input brings operational benefits, such as improvements in power-on-time. This is achieved by dynamic control of the arc power.

Electrode consumption will be reduced through limiting peak current values. These enhancements optimize efficiency and lower operating costs.

MAIN BENEFITS

- Proven modular multilevel converter
- Low flicker and harmonic generation
- AC furnace operation on weak grids
- Possibility to compensate a ladle furnace on the same busbar
- No additional compensation needed, i.e., furnace breaker and furnace reactor
- Flexible installation outside furnace building
- Increased arc stability
- Increased active power input with high dynamic current control
- Reduced power-on time and losses, increased productivity
- Reduced electrode consumption
- Longer maintenance-free periods due to reduced stress and wear on equipment



ENHANCED
PRODUCTIVITY



ENHANCED
QUALITY

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