CASE STUDY

Electrification in Glass Manufacturing with Thyro-PX SCR Power Controller

INDUSTRY	SOLUTION	EQUIPMENT
Glass Industry	Thyro-PX® SCR Power Controller	Glass Production Equipment

BACKGROUND

Historically, glass production has depended on fossil-fired furnaces, which significantly contribute to CO_2 emissions and air pollution. With mounting global pressures to decarbonize, glass manufacturers are exploring innovative solutions to eliminate fossil fuels from the production process, seeking not only environmental benefits but also improved efficiency and control.

A major glass industry leader was determined to invest in electrification, demonstrating a forward-thinking approach to sustainability and operational excellence. They aspired to transform their facilities by adopting a completely electric approach to glassmaking.

CHALLENGE

The customer faced several key challenges

- **Infrastructure investment:** Upgrading furnaces and the power grid to support high-capacity electrical loads required substantial capital and planning.
- **Electricity grid dependency:** Reliable access to stable and high-output electricity was essential for uninterrupted operations.
- **Material limitations:** Durability of electrodes and refractory materials needed careful evaluation to handle new operating conditions.
- **Industry hesitation:** Longstanding reliance on fossil fuel furnaces created apprehension about transitioning to unfamiliar technologies.

SOLUTION

The customer chose AE's Thyro-PX SCRs to solve these challenges.:

- The Thyro-PX is compatible with single-, dual-, and three-phase units up to 1000 V and 5000 A, offering advanced interface options.
- The 2.8-inch Thyro-Touch LED display provides intuitive integration of operating modes and parameters.
- The Thyro-PX® series is particularly well-suited for glass, metal, and ceramic manufacturing, as well as for managing electric furnace heating elements.
- An onboard SD card simplifies system setup and data storage.
- Features such as VSC (Voltage Sequence Control) and TAKT load management help minimize peak kVA demand and optimize energy use.
- The controller allows for extensive customization of faults, alarms, and set points, ensuring seamless integration with existing systems.

RESULTS

The transition to fully electric glass production yielded transformative benefits:

- **No fossil fuels:** CO_2 emissions from combustion were eliminated.
- **Efficiency:** Elimination of combustion and radiation losses dramatically improved overall energy use.
- **Precision:** Exact delivery of energy enhanced process control and product quality.
- **Sustainability:** Zero emissions of CO_2, NOx, or other pollutants safeguarded the environment.
- **Economic advantages:** The transition resulted in lower operational (OpEx) and maintenance costs, as well as greater capital (CapEx) efficiency.
- **Renewable integration:** Seamless compatibility with renewable energy sources supported broader decarbonization goals.
- **Market stability:** The customer eliminated their dependency on volatile fossil fuel markets.

CONCLUSION

This case study exemplifies the glass industry's pathway toward a sustainable, all-electric future. By embracing Thyro-PX SCR Power Controller technology, this manufacturer reduced their environmental footprint while enhancing the precision, efficiency, and resilience of their operations. Electrification stands as the definitive survival strategy for glassmaking in the modern era—ushering in a new chapter of innovation, competitiveness, and ecological stewardship.

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