

Better weld quality, lower power consumption – and not a flicker

ABB's high-tech electronically-switched dynamic compensators are helping Takao Europe Manufacturing deliver world-class welded sub-assemblies to Honda and Toyota. Weld quality has improved and power consumption has dropped.

Background

Takao Europe Manufacturing (TEM) is a world-class manufacturer of high quality metal automotive pressings and sub-assemblies for customers such as Honda and Toyota. Its fully automated manufacturing facility in Gloucester uses the industry's most advanced robotic welding equipment.

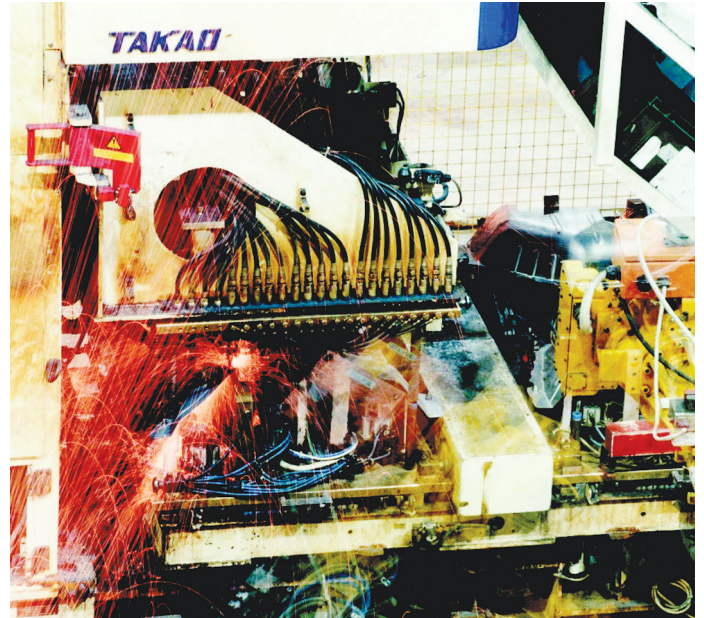
Takao needed to find a way of defeating the phenomenon known as 'flicker', a disturbance in the supply voltage created by the high currents drawn during the welding process.

Flicker occurs when a variable load such as a welding machine or crane demands a high current in a very short period of time. Typically, flicker is observed by dimming lights. But it can have serious effects on a wide range of sensitive equipment, especially PLCs and computers.

As well as wanting to eliminate any potential problems with its power supply, Takao also needed to ensure that it met the requirements of its local DNO, Central Networks. This called for compliance with the Electricity Networks Association Engineering Requirement P28 on limits for voltage fluctuations caused by industrial, commercial and domestic equipment.

A different solution

ABB was able to offer an ideal solution in the form of its Dynacomp electronic dynamic compensator systems.



Takao uses state-of-the-art robotic welding equipment.

The conventional solution for automatic reactive power compensation comprises banks of capacitors switched electromechanically by contactors. The problem is a slow response time while the precise instant of switching is variable and not controlled. This means that the switching of the capacitors results in a large transient. This transient disturbs the network, is harmful for the contactors and increases the stress on the capacitors. Electromechanically switched systems have limited lifetimes and need regular maintenance.

ABB has taken an alternative approach for applications having short rise times in designing its Dynacomp fast switching power factor correction equipment. The use of solid state power electronics (thyristors) rather than contactors enables the Dynacomp to switch the capacitors into circuit, with no inrush current, in 10 to 20 milliseconds, which is fast enough to compensate for any type of variable load. Since the switching is done at the instant when the network voltage is the same as the capacitor voltage, the switching of capacitor steps does not create any switching surge, and there is no need to allow discharge time between successive switchings.

Transient-free switching, with no electric arc and no moving parts, combined with the self-healing capacitors used in the Dynacomp, guarantees a long system life, with no limitation in the number of switching operations.



ABB's Dynacomp electronic dynamic compensator.

Improved control over weld quality

To date, ABB has installed a total of 11 800 kVAr Dynacomps at Takao. In addition to eliminating flicker, the reduction in inrush current is also providing greater control over the weld quality. And as a bonus the kVA load has also reduced considerably, lowering power consumption for the same production quantities with a superior quality of finished product.

For more information please contact:

ABB Limited
Power Products
Phone: +44 (0)151 3578400

www.abb.com/uk