

## T-SSR: APPLICATIONS

### Transformer Shield Stabilizer Regulator

The **T-SSR** is a stabilized transformer that integrates a power transformer and an SSR MV Controller in a single box.

The **T-SSR** MV is useful in case of the erection of a brand new MV electrical substation or when you want to install an SSR MV Controller and the existing power transformer is obsolete. In this case the integration of the two machines (power transformer and SSR MV Controller) leads to significant savings in space and installation cost.

Combining an SSR MV Controller to a distribution power transformer does not cause any problem of service life and maintenance.

Just like the stand-alone SSR MV Controller, the **T-SSR** MV can be typically applied in industrial and civil plants where the user needs to control the voltage level because, due to the load variation, the user's electrical assets are stressed by a voltage drop during the day and by a voltage increase during the night.

Typically, industries of significant size are feed by their own MV electrical substation and normally, the power transformer in such substation allows the manual voltage control within  $\pm 5\%$  of the nominal value. Nonetheless, the manual voltage adjustment operation is somewhat complex and brings risks to the operator safety. In addition, the manual voltage adjustment needs an outage of the plant and then bring unavoidable discontinuity in the industry's production. For these reasons, very often the users prefers to undergo the voltage variation and to accept to stress to their assets (and the related reduction in the asset's service life and increase of the maintenance costs).

The problem can be totally solved by use of the **T-SSR** MV.

The innovative **T-SSR** MV can stabilize the voltage for relatively low power, from 60 kVA to 2.000 kVA, where conventional voltage stabilizers are not used due to their high costs.

The **T-SSR** MV can also compete with traditional solutions up to 5.000 kVA thanks to the peculiarities of its operating principle.

Indeed, the design concept of the **T-SSR** MV is based on the control of dispersed magnetic fluxes and overcomes the need to use sliding contacts avoiding the relevant sparks and the related carbonaceous residues that negatively affects the conventional systems. Magnetic flow control is carried out by the dynamic positioning of a magnetic screen without any sliding contact by means of a simple screw-nut coupling assembly. The resulting design is:

- simple
- robust
- reliable
- with limited maintenance (comparable to that of static machines)
- able to ensure continuous control (and not step-by-step as in the conventional solutions)
- able to ensure wide control range (standard  $\pm 20\%$  and easily adaptable to specific customer requirements).

The **T-SSR** MV also applies to Distribution Utilities. The topology of a distribution network grid can vary and is often forced by what land is available and its geology. Distribution networks are divided into two types: meshed or radial.

In the second case, when the lines have a significant length, it may become essential to install an **T-SSR** MV to compensates for the voltage drop due to the load. This is the case, for example, of a valley where the users are located on slopes far away from the valley floor where the main electrical line is, or in forests or rural areas where the villages and the farms can be far away from the main road where normally is located the main electrical line.



In addition, the new paradigm of the Smart Grid, with the distribution networks fed by an increasing percentage of renewable energy sources, subject to significant short-term variations depending on weather conditions, will make increasingly useful and necessary to use devices such as the **T-SSR MV**.

The **T-SSR MV** is completely autonomous in its operation, so no auxiliary power is required (the auxiliary circuits are self-powered).

