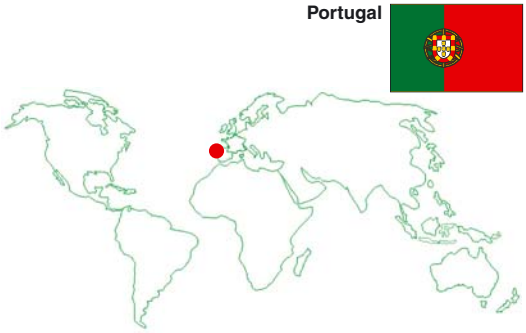
Industry paper

Solution to improve power factor correction and to reduce harmonic disturbances



Portucel - Portugal

Stakes for Portucel

Portucel, producer of eucalyptus and fine papers. Second European producer of Kraft bleached paste of eucalyptus with a capacity of 710,000 tons per year.

Project: the local distributors proposes to the paper-mill to sell them energy in the case where they need for the distribution network. To accept the contract, the paper mill has to improve its power factor in presence of harmonics.

To do this, they need to improve the power factor at 0.92 during the day and at 1 during the night.

Schneider Electric's global offer

Measurement of network's characteristics and diagnosis:
- power factor was poor according to the value requested by the local distributor,
- some harmonic currents existed on the installation.

Solution supplied with capacitor banks:
- fixed capacitor banks: four 5.6 Mvar and one 3.9 Mvar installed on the 11 kV.
- CP227 MV capacitor bank with detuned reactor (added on each capacitor bank) to avoid capacitors destruction (because of harmonic currents on the network).

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Benefits of the supplied solution

- Total cost savings: 12 million euros per year
- Implementation cost: 1 million euros
- Simple payback: 1 month.

The capacitors banks compensate the reactive power drawn by the loads on the electrical network.

➡ The power factor goes up to 0.92 during the day and around 1 during the night.

The capacitors banks reduce the apparent power (kVA) supplied by the electrical network.

➡ Thereby, reduction of the current and voltage drop across the network impedance.

The study of a power factor solution showed problems for the energy supplyment of EDP (local Portuguese energy distributor).

➡ However, the target cos φ has been achieved.

	No compensation				**With compensation**			
Measurement	*Day*		*Night*		*Day*		*Night*	
	TR4	TR5	TR4	TR5	TR4	TR5	TR4	TR5
Voltage (V)	5870	5920	5870	5920	6150	6100	6150	6100
Current (A)	2100	1650	2100	1650	2100	1650	2100	1650
Real power (kW)	18000	13000	18000	13000	18000	13000	18000	13000
Reactive power (kvar)	12000	10500	12000	10500	7500	8500	3500	4000
Power factor	0.85	0.8	0.85	0.8	0.92	0.92	1	1
THD (U) (%)	1.1	0.9	1.1	0.9	0.9	0.65	0.85	0.6
THD (I) (%)	0.9	1	0.9	1	0.5	0.68	0.48	0.62

MV capacitor banks Energy are designed for power factor correction in electrical networks.
Complete range, with standardized dimensions, assembled and tested in factory.

Schneider Electric Industries SAS

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