



MCR 25 Mvar, 110 kV, Komi-Perm Region, Russia



MCR 180 Mvar, 330 kV, Belarus

MCR— Saturated-Core Magnetically Controlled Shunt Reactor

- **reduce grid losses**
- **improve power quality**
- **optimize power transmission**
- **control operations automatically**
- **increase reliability**
- **simplify maintenance**

The MCR is a static, magnetic-bias-controlled, inductive shunt compensator of reactive power in alternating current electric power networks. It is designed for automatic reactive power compensation in transmission and distribution grids.

With the MCR you can *automatically*

- normalize system voltage levels
- restrict voltage fluctuation levels within 1 to 2%
- reduce grid power losses up to 20% during peak hours
- lower voltage control system switching equipment operation by 10 times

Install just one reactor and you have continuous control of the optimum voltage level for a substation serving tens of thousands of people.

Need reliability, efficiency, and quality of network operation?

Think MCRs  ***CERC - ЭЛПР / EXPANDING EDGE***



MCR— Saturated-Core Magnetically Controlled Shunt Reactor, FACTS Controller

MCR— In Brief

- Static, magnetic-bias controlled, inductive shunt compensator of reactive power in alternating current (AC) electric power networks for
 - connection to high voltage buses of transmission substation of 110 to 750 kV rated voltage (Substation MCRs);
 - direct connection to overhead power transmission line of 110 to 750 kV rated voltage, 110 to 750 kV (Overhead Line MCRs); and
 - direct connection to HV cable power transmission line of 110 to 500 kV rated voltage (Cable MCRs).
- Rated parameters:
 - Voltage: 110 to 750 kV
 - Reactive power: 25 to 540 Mvar
 - AC frequency: 50 or 60 Hz
 - Response time: 0.1 - 1 second, in accordance with customer's requirements.
- Number of commercial installations of devices since 1978: 13, all outside the US.
- Delivery: 9 month after initial payment or issuance of a letter of credit.

MCR— innovative, groundbreaking technology

- MCR technology provides a more reliable, more energy-efficient, less expensive, lower-maintenance, inductive reactive-power compensator, compared to the Thyristor Controlled Reactor (TCR), its closest functional analogue.

MCR— It's Easy Being Green!

- MCRs would save about 2% of transmitted power in the US grid by decreasing reactive network current circulation and cutting transmission losses in half. This means power savings, and power savings = saved natural resources + additional earnings for Transmission Owners.
- MCRs are inevitable in long-distance power transmission for renewable energy systems, as sites with good renewable-energy power production are frequently far removed from the point of use. This is particularly true of wind and hydro systems, where the location of the energy source cannot be easily altered.

MCRs— unprecedented reliability & voltage stability for US power transmission!

Developer



**CERC— CONTROLLABLE ELECTRIC REACTORS,
JOINT STOCK COMPANY, RAMENSKOYE - RUSSIA**

***Exclusive
Representative***

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The Controllable Electric Reactor Co. (CERC - ЭЛУР)

Since the 1980's, leading scientists and experts of Russia and the Commonwealth of Independent States' (CIS) electrical engineering industry have been developing controllable electric reactors. The *Controllable Electric Reactor Co. (CERC)* began operations in 2000 as a joint project of the *All-Russian Electrotechnical Institute (VEI)*, *Zaporozhtransformator*, Ukrainian transformer plant, the largest in Europe and *Energy*, a top-notch electrotechnical company located near Moscow, to develop, produce, and service magnetically controlled electric shunt reactors (MCRs).

CERC manufactures, delivers, installs, and adjusts *made-to-order* systems. Field operation in numerous countries and conditions has absolutely confirmed high consumer expectations. We are currently producing

- 110 to 550 kV MCRs for power systems
- 6 to 35 kV MCRs for distribution systems



MCR 100 Mvar, 220 kV, E. Siberia, Russia



MCR 3.63 Mvar, 11 kV, Mongolia

It's not often that a technology can be called inevitable. But the MCR is such an advance over comparable FACTS system, that we believe that the term applies.

Contact Expanding Edge LLC, exclusive US representatives for CERC.

And please consider attending the Midwest ISO Seminar, "High Surge Impedance Loading Transmission Line (HSIL) Design and Magnetically Controlled Reactor (MCR) Applications" scheduled for Thursday, September 16, 2004 in St. Paul. The Midwest ISO is very excited to bring this seminar to you and to have the developers introduce this new technology.

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