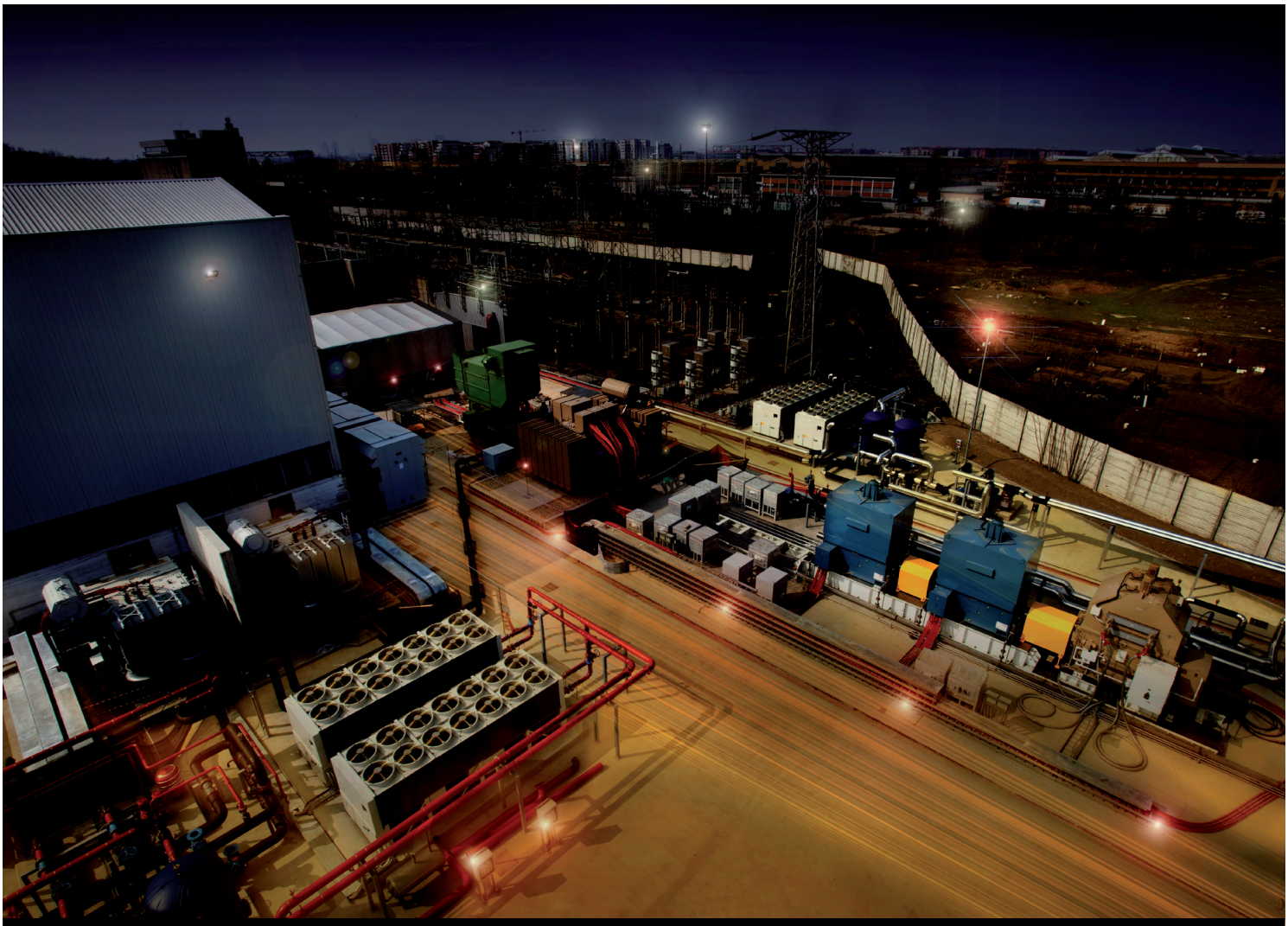


ABB testing facilities for rotating machinery electrical solutions

Power and productivity
for a better world™

ABB testing facilities ensure proven functionality and performance and reduce commissioning time

ABB is a leading supplier of Rotating Machinery Electrical Solutions (RMES), including variable speed drive systems (VSDS), soft starter systems, direct on line motors.

To verify equipment functionality and load performance, ABB developed state-of-the-art testing facilities in Milan, in close cooperation with CESI, a center of expertise and a global provider of technical and engineering services.

These testing facilities enable ABB to give evidence that the equipment under test meets customer requirements and reduces installation and commissioning time spent onsite.

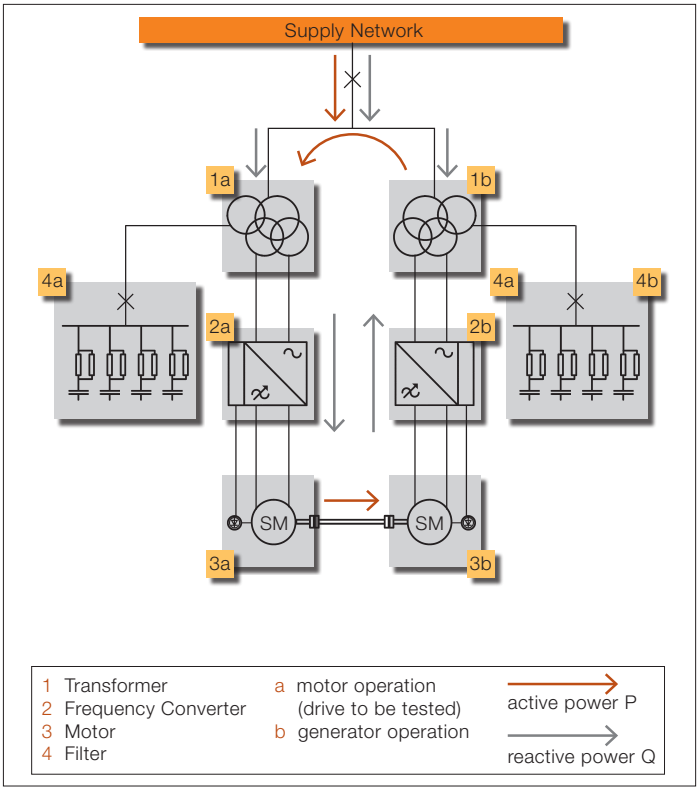
ABB's testing area provides world-class facilities for back-to-back and full load testing of variable speed drive systems with transformer, frequency converter and motor. It features two test bays, covering an area of more than 4,600 square meters and two inertial platforms of 240 and 300 square meters, respectively.
Test Bay One offers the possibility to perform back-to-back test on two regenerative variable speed drive systems up to 45MW shaft power, or higher on a case-by-case basis. Test Bay Two is devoted to full-load combined tests of single or non-regenerative variable speed drive systems up to 30MW, thanks to dedicated load machines.

In order to verify and guarantee equipment functionality before delivery, ABB can execute different tests such as full load performance, vibration and noise level measurement, protection checking and heat run tests, in accordance with IEC standards, ABB quality assurance procedures and customer requirements.

Test Bay One
Back-to-back test

With a total area of 1,900 square meters, Test Bay One is designed to test two customer regenerative variable speed drive systems in back-to-back configuration. The test bay includes a 240 square meter inertial test bed for rotating machinery. This inertial platform compensates for motor vibrations, providing a perfectly isolated area for all tests. Back-to-back tests can be conducted up to 45MW shaft power or higher on a case-by-case basis. Supply voltages can reach 33kV and higher upon request.

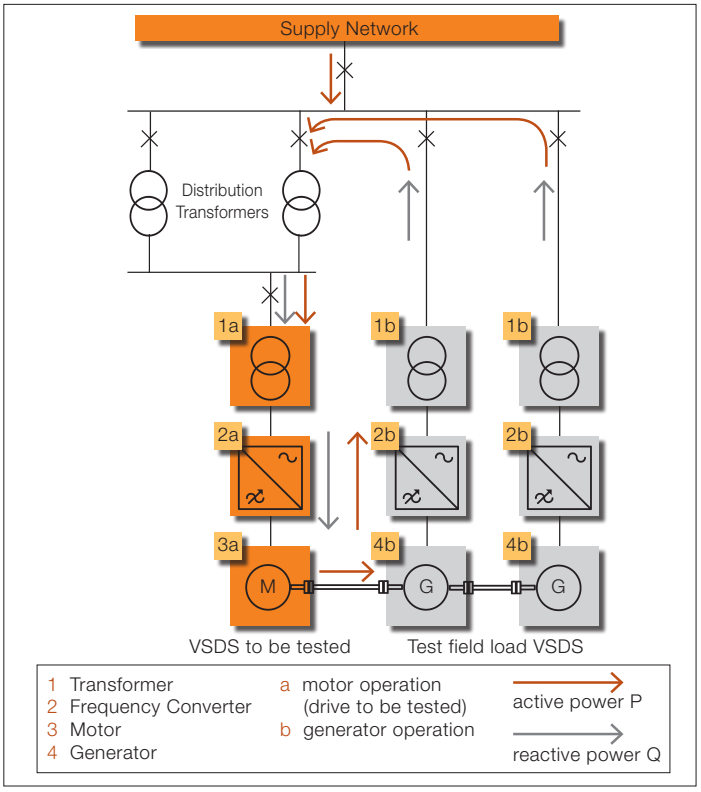
The diagram below shows the back-to-back test set-up of Test Bay One



Test Bay Two
Full load combined test

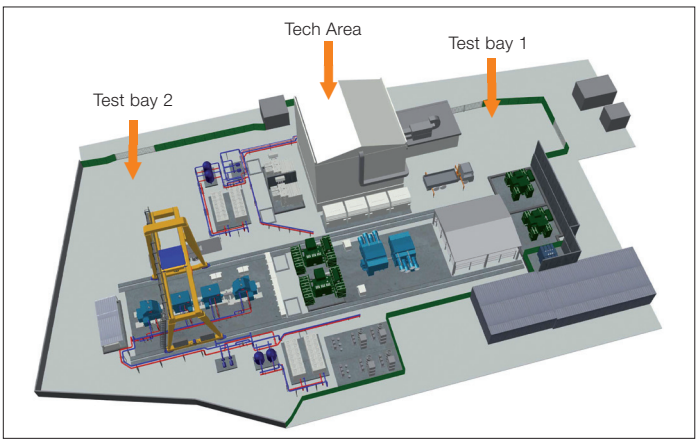
Test Bay Two covers a total area of 2,700 square meters and features a fixed installation of two regenerative variable speed drive systems rated 15MW each, which can be coupled in tandem configuration to get a 30MW load. It also has a complete medium voltage distribution to provide supply at 6.6kV, 11kV, 23kV and 33kV; two closed-loop water cooling systems for power electronics and machine cooling, and a measurement system specifically designed for mechanical torque and electrical harmonic measurement.

The diagram below shows the 30 MW test set-up of Test Bay Two



While designing and developing the test facilities, ABB and CESI performed a specific study of harmonics in order to avoid impact on the national electricity grid during all tests. Great emphasis was also placed on safety procedures and preventing environmental consequences during the testing process.

ABB is a leader in power and automation technologies that enable utility and industry customers to improve performance while lowering environmental impact. The ABB group of companies operates in around 100 countries and employs more than 135,000 people.



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