

PED LAB OF UNIVERSITA' DEGLI STUDI ROMA TRE

Research Areas

The Power Electronics and Electric Drives (PED) Laboratory is one of the main important laboratory facilities of the Department of Engineering at the University Roma Tre.

The main interests and research activities being carried on within the areas of Power Electronics and Electrical Drives relate to the design and control of power electronic converters, electrical machines and drives for both propulsion systems and distributed electric power generation. In particular, the activities refer to several themes being linked each other as the study of novel algorithms for the implementation of electrical drives regulation and control systems, design and prototypical construction of power electronic converters for both grid connected and stand alone applications, investigation of optimal criteria for thermal and electromagnetic design of both conventional and axial-flux permanent-magnet synchronous machines, analysis and experimental testing of electromagnetic compatibility in electric drives.

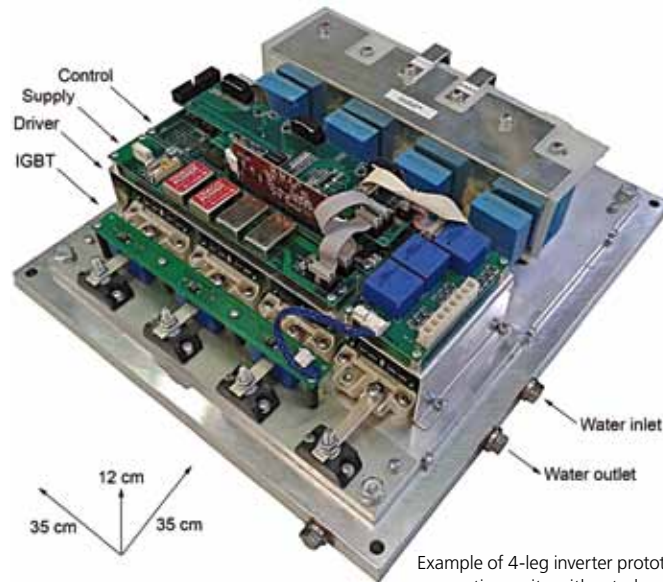
Recent advances and trends in power electronics are focused on integration of devices as well of functions, reduction of weight, size and cost, and improvement of systems efficiency. To this purposes at the PED Lab research is addressed to high-frequency, high-efficiency power converter technology, advanced analog

and digital control techniques, high performance electric drives design for power management and other applications.

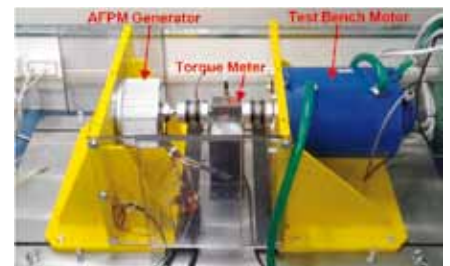
The research activities are typically performed in strong connection with either private companies or research centers, the achieved results have been published through numerous scientific papers on the most recognized international journals as well conference proceedings.

Laboratory Facilities

The laboratory is fully furnished with powermeters, digital scopes, thermal analyzers to perform experimental testing with controlled energy sources in both AC and DC and the following main equipment



Example of 4-leg inverter prototype for distributed generating units with rated power of 40 kVA



High Speed Electric Drives test bench

- Electric Drives test bench with 4-quadrant 3-phase front-end power converter, rated 6000 rev/min, 60kW, 400Nm up to 1500 rev/min.
- High Speed Electric Drives test bench with 4-quadrant 3-phase front-end power converter, rated 20000 rev/min, 40Nm.
- 0-200kW resistive and non-linear loads.
- 16.7F – 252V supercapacitors tank.
- Fully equipped EMC chamber.