

Protection and Control Panels for HV and MV Substations



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Proton designs protection and control panels to cater for various applications according to customer requirements, using latest technology relays which are supplied by Schneider Electric, Siemens and ABB. Our panel designs take numerous factors into considerations such as: ambient conditions, site installation and personnel safety without compromising the ease of operation, security, maintenance and commissioning.



Figure 1 - Schematic Design

PROTECTION AND CONTROL DESIGN SOLUTIONS

- Design of protection schemes and systems appropriate to the application.
- Selection of high quality equipment Relays, Annunciators, Test blocks and all wiring ancillaries.
- Relay programming customised to the protection scheme as required.
- Preparation of wiring interface to different switchgear panels and types.
- Schematic drawings & wiring lists using advanced automated CAD software.
- Factory assembly and wiring of designed system.
- System testing to the scheme drawing to verify the functions of equipment, manufacture and design.



Figure 2 - Protection scheme testing

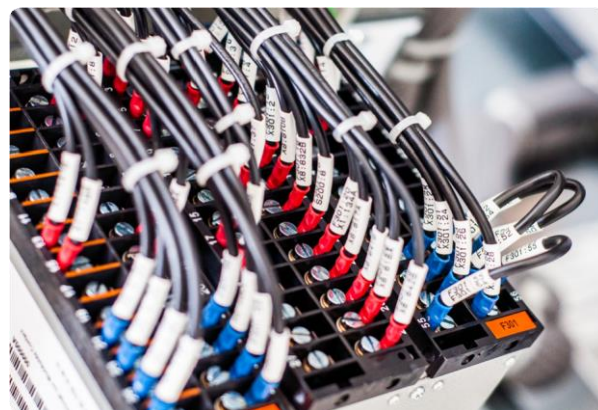
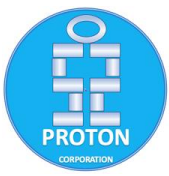


Figure 3 – Factory Assembly and wiring



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ENCLOSURE DESIGN

- Enclosure typical dimensions:
 - 2050 x 800 x 800 mm
 - 1900 x 600 x 600 mm
 - Custom sized enclosures
- Free standing, floor fixing holes provided on bottom frame.
- Hinged front and rear doors, both lockable to prevent access to unauthorized personnel.
- Front access for operation.
- Rear access for cable interface.
- Removable side panels, ventilation if required.
- Various types of mounting plates with custom made cut-outs for different relays and equipment including standard 19" type.
- Bottom cable entry, optional at the top.
- Cable supports and removable gland plates.
- Internal ambient control and lighting including door switch.
- Lifting points available.

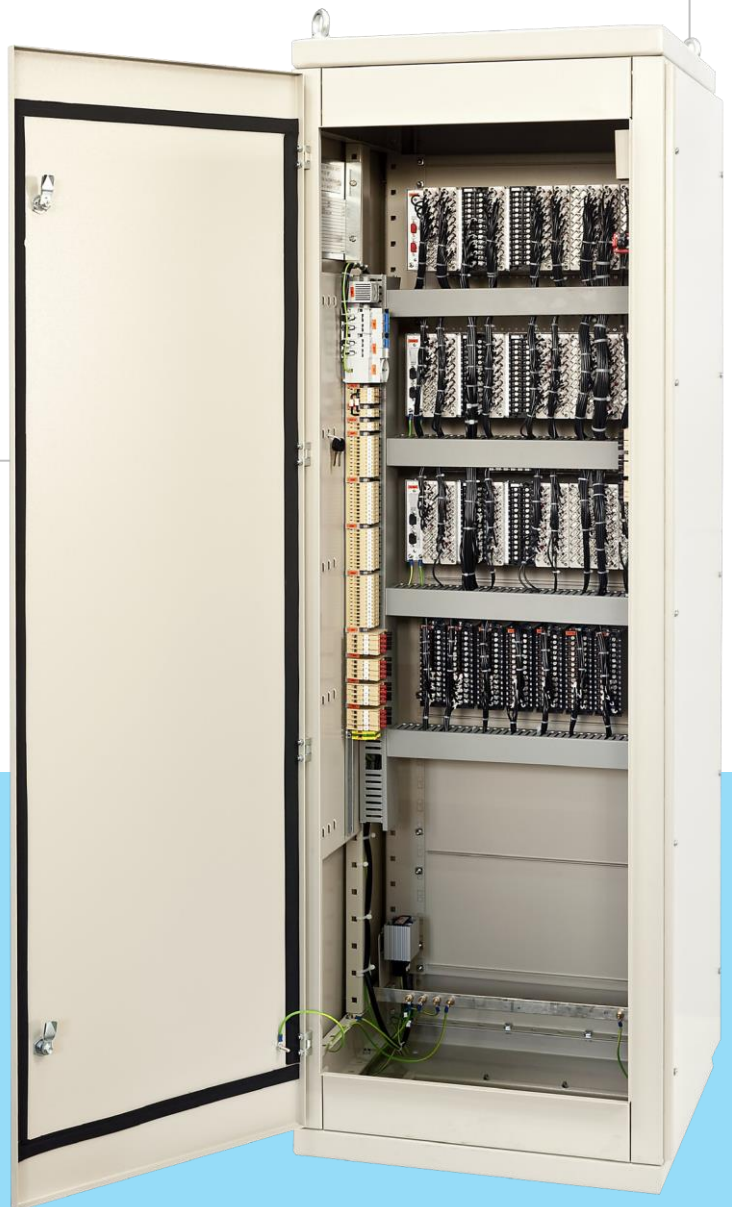


Figure 4 – Customised Enclosures

TYPICAL PANEL APPLICATION

LINE FEEDER PANEL

- Distance relay
- Directional Overcurrent & Earth fault relay

TRANSFORMER PANEL

- Differential protection
- Overcurrent & Earth fault relay

OTHER FEATURES INCLUDED

- Power Measurement
- Control of switchgear devices
- Trip Circuit Supervision
- Test Blocks for secondary injection



Figure 5 – Feeder panel for 66KV switchgear

BUSBAR PROTECTION PANEL

- Differential busbar protection.
- Fast fault trip (typically 12 or 17 ms).
- Synchronous or Sequential trip.
- Adapted to different busbar configurations.
- Future extension of the busbar supported.
- Can operate with different CT types.
- Programmable scheme logic supported.
- Programmable function keys, hotkeys and tri-colour LEDs.



Figure 6 – Busbar protection panel

AUTOMATIC VOLTAGE REGULATOR

- Measures, Controls and Regulates voltage transformers.
- Modular and Flexible, Design to customer requirements.
- Interfaces to different transformer types.
- Up to 4 control modules in one panel.
- Possibility of parallel operation of transformers.
- Integration on IED networks using IEC 60870-5-103 & IEC 61850



Figure 7 – Automatic voltage regulator

