

OGYD

Protecta provides two different types for busbar protection. Both of them perform basically the well-known low impedance biased differential algorithm with directional check.

The numerical protection integrates two independent protection functions:

- numerical differential protection,
- breaker failure protection.

THE DISTRIBUTED NUMERICAL BUSBAR DIFFERENTIAL PROTECTION

- In this version separate bay units or other individual protective devices of the bays (e.g. distance protection, overcurrent protection, etc.) are involved in the busbar protection scheme. They are located in the substation according to the bay structure of the primary system. These devices perform the sampling of the currents and have access to all information needed for the busbar protection system. This information is sent by fiber optic link to the central unit. The calculation and decision is performed by the central unit, and the dedicated trip commands are sent back to the bay devices also via fiber optic links.

INNOVATIVE SOLUTIONS

- Separated relay functions and communication/HMI functions in two high performance processors
- Protecta-developed code for protection functions
- Linux application for communication/HMI functions
- Short startup time for relay functions
- High-speed relay outputs for sub-cycle tripping
- Trip circuit supervision for each trip contact
- Proprietary IP rated connector for local Ethernet communication without galvanic connection
- Redundant Ethernet ports for station bus
- Parameter setting for rated input voltage and current (no HW modification is needed)
- Advanced HMI functionality by color touch-screen and embedded WEB server

COMMUNICATION

- Local HMI
 - QVGA (320 x 240) 65536 color 3.5" (optionally 5.7") TFT display
- Contact-free front panel
 - Combined Ethernet and serial connector for communication with a connected portable computer
- Standard Ethernet
 - Peer-to-peer communication over contact-free front panel connection
 - RJ45 twisted pair connection to the Ethernet
 - Optical connection to the Ethernet
 - Optional RJ45 service port at front panel
- Legacy protocols
 - Serial protocols (IEC 60870-5-101/103, Modbus RTU, DNP3, ABB-SPA)
 - Network protocols (IEC 60870-5-104, DNP3, Modbus-TCP)
 - Legacy network based protocols via 100Base-FX and 10/100Base-TX (RJ45)
- IEC 61850
 - Native IEC 61850 compatibility
 - Factory default datasets
 - GSE control blocks for GOOSE publishing
- Time synchronization

TOOLS

- WEB browser (EOB and Ethernet)
- EuroCAP advanced configuration tool
- Evaluation of disturbance records

**MICROENER**

OGYD CONFIGURATION

		OGYD
IEC	ANSI	
3I _d T >	87B	X
CBFP	50BF	X

FUNCTIONS

- Busbar differential (87B)
- Breaker failure protection (50BF)

THE MAIN FEATURES OF THE BUSBAR DIFFERENTIAL PROTECTION FUNCTION CAN BE SUMMARIZED AS FOLLOWS

- The function is performed within one central device, but the analog currents and status signals from all bays of the busbar are accessed by protection devices dedicated to the bay;
- The bay units can perform any other protection function, but they communicate binary information with the central device via fiber optic links;
- Dynamic busbar replica, based on disconnector status signals;
- High stability in case of external faults in case of current transformer saturation;
- Short tripping time;
- Selectivity for internal fault, only the bays connected to the faulty busbar section are disconnected, all other bays remain in continuous operation;
- Easy to extend according to the busbar configuration;
- Easy adaptation of the function for different primary bus systems:
 - Single busbar,
 - Up to quadruple busbar,
 - Ring bus,
 - 1 ½ circuit breaker arrangement,
 - Bus couplers,
 - Bus sectionalizers with one or two current transformers,
 - Transfer bus;
- Individual numerical calculation and decision for all three phases;
- Stabilized differential current characteristics;
- The security and stability are increased with special software methods;
- Voltage breakdown condition,
- Check zone application,
- Saturated waveform compensation,
- Directionality check,
- Current transformer failure detection,
- Checking the disconnector status signals,
- Included breaker failure protection,
- Optional neutral current measurement.

THE CONFIGURATION OF THE FUNCTION

In the distributed version, the functionality of the busbar differential protection function is performed in co-operation of one central unit and of several bay units.

The central unit performs the organization of the busbar protection system, and also the numerical calculations and decisions are performed in this module. Based on the disconnector status information, received from the bay units, "Measuring elements" are composed. A "Measuring element" processes all currents, which flow into or out of the interconnected bus sections. The trip commands are passed to the circuit breakers via the protection device related to the bays. For the configuration, in the central device parameter values are needed; these parameter values are to be set in the central device for the bays individually.

The bay units are the "interface" between the power technology (measuring transformers, disconnector status signals, circuit breaker trip commands) and the busbar protection function in the central device. These units sample the assigned phase currents and voltages, and send them, together with the status information to the central device via fiber optic network.

