

Sample specification REB 670

The IED shall be suitable for protection and monitoring of busbars of different types such as single busbars, double busbars with or without transfer bus, 1 ½ breaker stations, T-connections and busbars in H-type stations.

The IED shall, by adding the required number of I/Os, be suitable to apply in a small substation with few bays or in a bigger substation with more than twenty bays.

The IED shall be applicable in extra high voltage as well as medium voltage power systems. The IED shall have phase-segregated measurement and give a fast and selective protection of the protected object.

The operate time for internal faults shall be less than 15 ms and the differential protection shall be absolute stable for through faults even at heavy CT saturation and also at maximum remanence in a CT core and auto-reclosing.

In solidly grounded or low impedance grounded systems the IED shall detect all types of faults. For detection of earth-faults in low impedance grounded systems the IED shall include a separate sensitive differential protection which should be released from e.g. open delta voltage and be blocked at heavy phase to phase faults.

In high impedance grounded systems the IED shall detect multi-phase faults.

No interposing CT shall be necessary and the IED shall have low requirements on the main current transformers. It shall be possible to have a ratio difference of up to ten for the CTs connected to the same protection zone. Different main CT ratio shall be compensated by parameter setting.

No switching in CT secondary circuits is allowed.

A function for fast detection of open or shorted CT secondary circuits shall be included and it shall be possible to set the function for blocking of the differential protection zone or switch it off.

In order to achieve cost effective solutions the IED shall be equipped with two measuring zones and check zone as well as the possibility to integrate breaker failure protection and end-fault protection for every CT input.

It shall be possible to select the CTs which should be connected to the check zone and it shall also be possible, by setting, to switch off the check zone.

The IED shall include an internal permanent memory based disconnector replica logic and bay tripping logic.

Supervision of disconnector status shall be included and an alarm signal shall be issued after a settable time delay in case of a deviating position for the primary contact.

The IED shall have a software based zone selection.

It shall be possible to have only one set of CTs at the bus section or at the buscoupler. The zone selection should also handle load transfer for double busbars and routing of

trip commands from differential protection and breaker failure back-up trip to all breakers connected to the faulty zone.

The breaker failure protection shall have a reset time of maximum 15 ms, allow single and/or three phase starting, perform retrip of own breaker after a short settable time delay and perform a back-up trip of surrounding breakers.

The end fault protection shall be activated when the breaker has been opened during a certain settable time and shall operate for faults between the CTs and the open breaker. A trip signal shall be sent to the remote end when the breaker is placed between the busbar and the corresponding CTs.

The equipment for sending the information to the remote end should be an integrated part of the IED.

The IED shall have extensive self-supervision including analog channels.

A disturbance recorder which can handle at least 30 analog channels and at least 60 binary signals and that can record the last 50 disturbances shall be included.

An event recorder shall also be an integrated part of the IED and shall handle up to 150 time tagged events per disturbance and record the last 50 disturbances.

It shall be possible to retrieve the disturbance and event recorder information based on Comtrade format locally or from a remote location.

In order to achieve cost effective engineering, testing and commissioning shall pre-configured, ready to use IEDs for different applications be available.

If needed, it shall be easy to modify the configuration.

At new installations or at extensions and replacements in existing installations it shall be possible to integrate the IED into a substation automation or monitoring system or use the IED as a stand-alone unit.

The IED shall be provided with a front mounted human machine interface (HMI) and a galvanic isolated front port for connection of a personal computer.

The HMI shall include LEDs for status indication and at least 15 configurable LEDs for alarm indication.

The IED shall be provided with communication interface for connection to substation automation system and substation monitoring system.

IEC 61850-8-1 and IEC 60870-5-103 communication protocol shall be available. The IED shall meet the IEC 61850 standard in every respect and interoperability with other manufactures IEDs and tools shall be verified.

Binary signal transfer to remote end of at least 24 signals should be available.

It shall be possible to select different mounting alternatives such as rack, flush or wall mounting.

Depending of the required numbers of I/O modules in the IED shall 1/1 x 19" and 1/2 x 19" cases be available.

Power supply modules from 24 to 250 V DC +/- 20 % shall be available.

GPS time synchronization module with GPS receiver used for time synchronization shall be available.

A test switch for mounting in connection with the IED should be available.

One CD-ROM with manuals and Getting started guide shall always be included for each IED.