INGEPAC™ EFx BD

Central unit for distributed busbar differential protection

Distributed busbar differential protection

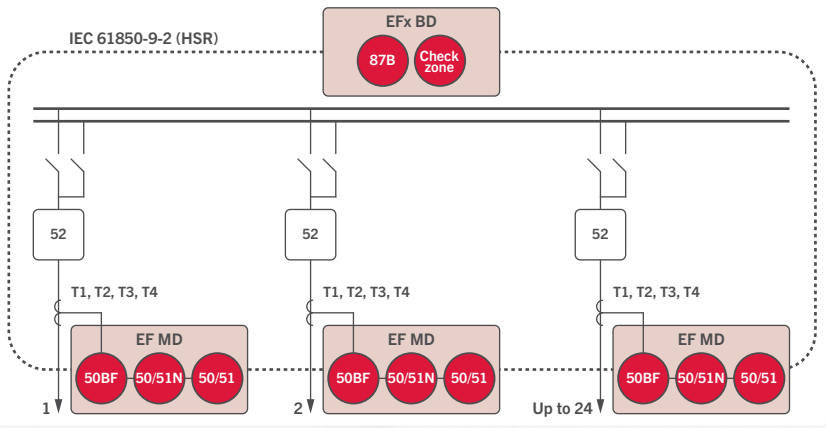
INGEPAC EFx BD acts as the **central unit of a distributed busbar protection**, the most critical element when it comes to substations protection systems.

Busbar differential protection is based on **IEC 61850 process bus**, using the communications between the INGEPAC EFx BD central unit and the INGEPAC EF MD bay units.

INGEPAC EFx BD manages all the information and data received from the INGEPAC EF MD devices as **Multicast Sampled Values** messages and will send the different trip orders to these units through **GOOSE messages**.

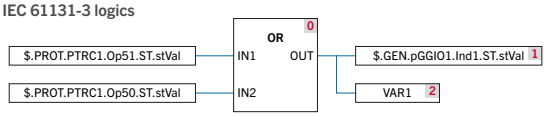
Applications

- Distributed busbar differential protection to protect schemes with up to 5 zones and 24 bays

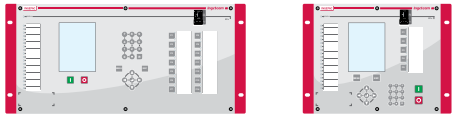


Functions	INGEPAC EFx BD (Central unit)	INGEPAC EF MD (Bay unit)
Busbar differential unit (87B)	X	
Phase checkzone unit	X	
Differential alarm unit	X	
Inrush unit	X	
Breaker failure (50BF)		X
Phase overcurrent (87B)		X
Neutral overcurrent (87B)		X
Phase overcurrent (50BF)		X
Neutral overcurrent (50BF)		X
Dead zone	X	
Disconnector discrepancy alarm		X
Dynamic zone logic	X	
Lockout (86)	X	X
Inrush stability	X	
CT & VT supervision		X

IEC 61131-3 logics



Local HMI
4,9" display
Graphical displays
I/O/L/R pushbuttons
19 LEDs
Keyboard



Data acquisition
SOE (4000)
Oscillography

Synchronization
IEEE 1588 v2
SNTP
IRIG-B
PPS

Web services
HTTP / HTTPs
FTP / sFTP
SSH

Protocols
IEC 61850 (PRP/HSR)
GOOSE subscription
Sampled Values subscription

Measurements
Phase and neutral currents of bay units
Up to 5 busbar differential and restraint current of phases
External power supply
Device temperature (ºC)

Ingeteam ELECTRIFYING A SUSTAINABLE FUTURE

INSULATION AND ELECTROMAGNETIC TESTS

Electrostatic discharge immunity	IEC 61000-4-2
Radiated radiofrequency electromagnetic field immunity	IEC 61000-4-3
Electrical fast transient / burst immunity	IEC 61000-4-4
Surge immunity	IEC 61000-4-5
Immunity to conducted disturbances, induced by radiofrequency fields	IEC 61000-4-6
Power frequency magnetic field immunity	IEC 61000-4-8
Impulse magnetic field immunity	IEC 61000-4-9
Damped oscillatory magnetic field immunity	IEC 61000-4-10
Ripple on DC input power port	IEC 61000-4-17
Damped oscillatory wave immunity	IEC 61000-4-18
Voltage dips, short interruptions and voltage variations immunity	IEC 61000-4-29
Power frequency immunity	IEC 60255-22-7
Electromagnetic compatibility requirements	IEC 60255-26

CLIMATIC TESTS

Cold	IEC 60068-2-1
Dry heat	IEC 60068-2-2
Change of temperature	IEC 60068-2-14
Damp heat cyclic	IEC 60068-2-30
Damp heat steady	IEC 60068-2-78

MECHANICAL TESTS

Vibrations	IEC 60255-21-1
Shock and bump	IEC 60255-21-2
Seismic	IEC 60255-21-3

MAIN FEATURES

Communication between position units and the central unit based on the IEC 61850 process bus: Sampled Values messages for analog measurements and GOOSE messages for digital signals and triggers.

Supported Sampled Values standards: IEC 61850-9.2 LE and IEC 61869.

Different variants of hardware configurations, allowing to define the appropriate equipment for the application.

High precision in direct measurements (class 0.2 in currents and voltages).

Front USB to access the equipment and retrieve reports and device CID, load an external CID, load the firewall configuration or update the device firmware.

Synchronization from communications protocols, SNTP, IEEE 1588 v2 (PTP), demodulated IRIG-B input or PPS input, pacFactory or display.

Web server for monitoring and setting without needing additional software.

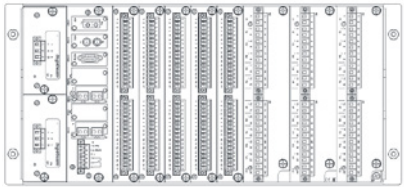
Cybersecurity features: sFTP, HTTPs, firewall, audit log, password accessing, RBAC, LDAP, session management, etc.

Application software specifically designed for simple and user-friendly access to the equipment.

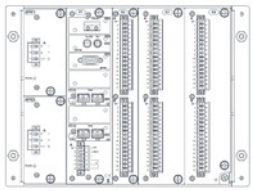
HARDWARE OPTIONS

Mounting options

- 5U 19" rack (up to 8 slots)



- 5U compact rack (up to 3 slots)



Optional

- High break contact outputs
- High speed outputs

Boards options

- 11 DI + 9 DO
- 32 DI
- 16 DI + 8 DO
- 16 DI + 16 DO
- 8 DI + 8 DO

Communication ports

Front:
- RJ45
- USB

Rear:
- Up to 4 Ethernet (FO or RJ45)
- Up to 5 serial (FO, RS232, RS485)

Power supply

- 48, 125 and 220 Vdc
- Power: 20 W + 0,5 W active relay
- Optionally redundant power supply

IP54 front protection optional

SOFTWARE

All the devices in the INGEPAC™ product range can be accessed using powerful software tools developed by Ingeteam which run on Windows®

Application specifically designed for simple and user-friendly access to the equipment

INGESYS eFS

CE UK CA

CYBERSECURITY

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