

# BCF

## Capacitor Bank Protection (ZIV e-NET flex family)



ZIV Model BCF for capacitor banks in grounded or ungrounded, **single** or **double wye**, **delta** or **H** configuration, with external or internal fuses, or fuseless

### General characteristics

- ✓ Powerful programmable logic
- ✓ 2000 event log. Up to 100 oscillography seconds
- ✓ Alphanumeric or graphic display
- ✓ Easy HW expansion without FW updates
- ✓ Unused protection elements can be hidden
- ✓ Custom mapping of physical current and voltage inputs to protection elements
- ✓ Can be used to protect multiple bays
- ✓ Up to 20 analog channels, 160 DI, 80 DO, and 22 LEDs
- ✓ Bonding, RSTP, PRP and HSR redundancy
- ✓ IEC 61850 ed. 1 & ed. 2 protocols, DNP3.0, Modbus RTU and PROCOME
- ✓ Native process bus. Analog input cards operate as Merging Units for the CPU. Synchronized samples at 4800 Hz (as per IEC 61869-9)
- ✓ Cybersecurity in accordance with IEC 62351 and IEEE 1686-2013 standards. RBAC, secure keys, physical and logical port disabling, cybersecurity event log, and securing of management protocols (PROCOME, HTTPS, SFTP, SSH)
- ✓ Time synchronization by IRIG-B, SNTP and PTP (Ordinary Clock / Transparent Clock)

The **main protection units** are **differential voltage**, **voltage unbalance**, and **current unbalance**, all of them with a calibration feature that eliminates the inherent imbalances of the bank.

A series of additional **overcurrent** and **voltage units** provide backup protection.



## Characteristics

### Phase Voltage Differential Unit

Measures the difference between the bus phase voltage and the capacitor bank intermediate tap phase voltage considering PT ratios.

For ungrounded banks the differential voltage unit ponders the neutral voltage in the differential calculation.

A calibration feature is applied once the capacitor bank is connected, cancelling errors and imbalances due to tolerances in the manufacturing process of the bank itself. The calibration enables more sensitive settings.

### Compensated voltage unbalance unit

Measures the difference between the calculated bus neutral voltage and the capacitor bank neutral voltage, considering PT ratios. The differential voltage represents the capacitor bank voltage unbalance without the system voltage unbalance.

A calibration feature enables a more sensitive setting by eliminating inherent unbalances due to tolerances.

### Phase current unbalance unit

Calculates the current circulating in the same phase on two parallel banks. This method eliminates any system unbalance since both banks are affected equally. Can be applied in grounded or ungrounded banks.

A calibration feature enables a more sensitive setting by eliminating inherent unbalances due to tolerances.

### Neutral current unbalance unit

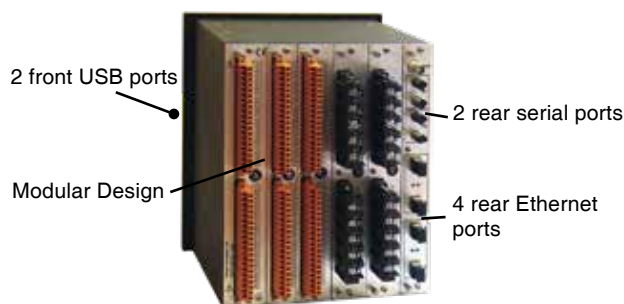
Calculates the neutral current circulating between two parallel banks with a common neutral. This method eliminates any system unbalance since both banks are affected equally. Can be applied in grounded or ungrounded banks.

A calibration feature enables a more sensitive setting by eliminating inherent unbalances due to tolerances.

## Protection units

ANSI	FUNCTIONS	
60P	Phase current unbalance	3
60N	Neutral current unbalance	3
50	Instantaneous phase overcurrent	6
51	Time phase overcurrent	6
50N	Instantaneous Neutral overcurrent	6
51N	Time Neutral overcurrent	6
50Q	Instantaneous negative sequence overcurrent	6
51Q	Time negative sequence overcurrent	6
50G	Instantaneous ground overcurrent (measured)	6
51G	Time ground overcurrent (measured)	6
50V	Instantaneous voltage restrained overcurrent	3
51V	Time voltage restrained overcurrent	3
67	Phase directional overcurrent	1
67N	Neutral directional overcurrent	1
67G	Ground directional overcurrent	1
67P	Positive-sequence directional overcurrent	1
67Q	Negative-sequence directional overcurrent	1
	Harmonic Blocking	2
87V	Phase voltage differential	3
59C	Compensated neutral unbalance	3
27	Phase undervoltage	3
59	Phase overvoltage	3
59N	Neutral overvoltage	3
64	Ground overvoltage	3
81M	Overfrequency	4
81m	Underfrequency	4
81D	Frequency Rate of Change	4
	Load shedding	1
50BF	Breaker failure	2

ZIV continually strives to improve products and services. The technical information included in this document is subject to change without prior notice.



Three sizes: Full 19" rack, 1/2 rack, or 1/3 rack with 6U high

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