IRF-B/C/D

Breaker IED & BCU
(ZIV e-NET flex family)

Circuit breaker management device and **BCU** (Bay Control Unit)

General characteristics

- ✓ Powerful programable logic.
- ✓ 2000 event log. Up to 100 oscillography seconds.
- ✓ Alphanumeric or graphic display.
- ✓ Multiple combinations of DI & DO, with up to 216 DI, or 160 DO, and up to 18 output transducers.
- ✓ 6 or 12 programmable push buttons.
- ✓ Bonding, RSTP, PRP and HSR Redundancy.
- ✓ IEC 61850 Ed.2, DNP3.0, Modbus RTU and PROCOME Protocols.
- ✓ 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, IEC 62443 and IEEE 1686-2013 standards. RBAC, secure keys, physical and logical port disabling, cybersecurity event log, securing of management protocols (PROCOME, HTTPS, SFTP, SSH), remote authentication (LDAP, RADIUS) and digital firmware securitization.
- ✓ Time synchronization by IRIG-B, SNTP and PTP (Ordinary Clock / Transparent Clock).

The **IRF-B** and **IRF-D** are applicable in double breaker or breaker and a half bays, and in single breaker bays, respectively.

The **IRF-C** cab be used as General Alrms BCU, and as extension of DI & DO as well.

The powerful **programmable logic** features **selectable execution times** according to the required priority (2 ms, 10 ms and 20 ms). Includes many digital and analog operators, which allows the creation of complex protection and control functions.

Outstanding features

Automatic Recloser

Automatic reclose function for two circuit breakers with Master-Slave Functionality. Single-phase, three-phase, combined and selectable trip modes available. Recloser timers are differentiated per fault type and reclosing attempt.

Synchronism Unit

Provided with two synchronism units per breaker (depending on the model), which receive up to three different voltage inputs allowing for selection of Busbar 1, Busbar 2, Line 1 or Line 2 voltage input depending on Line or Busbar disconnector status and bay configuration varying among single breaker, double breaker or breaker-and-a-half. Dead/Live Line/Bus Detector and adjustable angle compensation that allows for input from different phases is also provided.

Breaker Supervision

Breaker Supervision function allows for arc energy dissipation calculation for each pole, excessive number of trips supervision and adjustable open and close mechanical and electrical operating time monitoring.

Breaker Failure

Breaker Failure protection uses two phase and one neutral overcurrent element provided with adjustable Single-phase, Three-Phase and Neutral pickup settings. It includes a Retrip Function with the purpose of sending a new trip command to the failed breaker. Fast reset time (about 5ms) is achieved by using instantaneous values besides RMS current values. No-load breaker and previously failed breaker situations are also accounted for.

Protection Units

ANSI	Function	IRF-B	IRF-C	IRF-D
50	Instantaneous Phase O/C	4***	--	4
51	Time-delayed Phase O/C (Inverse/Fixed)	4***	--	4
50N	Instantaneous Neutral O/C	4***	--	4
51N	Time-delayed Neutral O/C (Inverse/Fixed)	4***	--	4
50G	Instantaneous Ground O/C (*)	4***	--	4
51G	Time-delayed Ground O/C (Inverse/Fixed)	4***	--	4
50Q	Instantaneous Negative Sequence O/C (I2)	4***	--	4
51Q	Time-delayed Negative Sequence O/C	4***	--	4
50Ns	Instantaneous Sensitive Ground O/C	--	--	1
51Ns	Time-delayed Sensitive Ground O/C	--	--	1
51Ns EPTR_C	Time-delayed Sensitive Ground O/C with EPTR_C	--	--	1
51Ni/c	Ungrounded/Compensated Neutral O/C	--	--	1
50V	Instantaneous Voltage Dependent O/C	--	--	1
51V	Time-delayed Voltage Dependent O/C	--	--	1
67	Phase Directional	1	--	1
67N	Neutral Directional	1	--	1
67G	Ground Directional	1	--	1
67Ns	Sensible Neutral Directional	1	--	1
67P	Positive-Sequence Directional	1	--	1
67Q	Negative Sequence Directional	1	--	1
67Ni/c	Isolated / Compensated Neutral Directional	--	--	1
85	Overcurrent Teleprotection Schemes	1		1
	High Impedance REF Unit	1	--	1
	High Impedance Differential Busbar Unit	1	--	1
	High Impedance Differential Alarm Unit	1	--	1
50BF	Breaker Failure Unit with Retrip Function	2	--	1
87N	Restricted Earth Faults Unit	--	--	1
67TEFP	Transient Earth Faults Protection	--	--	1
	Saturation Detector	1	--	1
	Harmonics Blocking	1	--	1
37	Time-Delayed Phase Undercurrent	--	--	1
46	Open Phase Unit	1	--	1
49	Thermal Image Unit	1	--	1
	Hot Spot Thermal Image Unit	1	--	--
	STUB Bus Protection	1	--	--
	External Fault Detector	1	--	--
	Instantaneous Overload unit	1	--	--
	Time-delayed Overload unit	1	--	--
27	Phase Undervoltage	4***	--	4
27SPH	Single-Phase Undervoltage (Vsyn)	6	--	2
59	Phase Overvoltage	4***	--	4
59SPH	Single-Phase Overvoltage (Vsyn)	6	--	2
59N	Neutral Overvoltage	4***	--	4
64	Ground Overvoltage	4***	--	4
47	Negative Sequence Overvoltage	1	--	1

ANSI	Function	IRF-B	IRF-C	IRF-D
81M	Overfrequency	4	--	4
81m	Underfrequency	4	--	4
81D	Rate of Change of the Frequency	4	--	4
	Load Shedding		--	1
59V/Hz	Overexcitation	4	--	4
78	Out-of-Step	--	--	1
32P/Q	Directional Power (active / reactive)	--	--	2
79	Recloser	2****	--	1
50FD	Fault Detector	1	--	1
60FF	Fuse Failure Detector	1	--	1
	Phase Selector	1	--	1
25	Synchronism Check Unit	4	--	2
	Cold-Load Unit	--	--	1
60VT	VT Supervision	1	--	1
60CT	CT Supervision	2	--	1
60CTI2	CT Supervision by Negative Sequence Current	--	--	1
60CTNDIF	CT Supervision by Neutral Differential Current	--	--	1
3	Coil Supervision	*	--	*
	Breaker Supervision	2	--	1
21FL	Fault Locator	1	--	1
	Transducer Voltage Supervision	1**	--	1**
2	Pole Discrepancy	2	--	1
	Open Pole Detector	2	--	1
	Dead Line Detector	1	--	1
	Trip Logic	1	--	1
	Calendar	1	1	1

New Extended HMI

(*) Depending on the Hardware Selection.
(**) Models with digit X9=3.
(***) Dependign on FW digits X27+X28. Model with FW digits X27+X28 under 13 feature 3 units, models with FW digits X27+X28 equal or greater than 13 feature 4 units.
(****) Recloser for breaker and a half configuration.

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