IRF

Feeder Protection
(ZIV e-NET flex family)

Protection for **Distribution Feeders**, **Transformers** and **Generators**, **Transmission Line Backup** and **BCU** (Bay Control Unit)

General characteristics

- ✓ Powerful programable logic.
- ✓ 2000 event log. Up to 100 oscillography seconds.
- ✓ Alphanumeric or graphic display.
- ✓ 160 DI, 80 DO and 22 LEDs.
- ✓ 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** is applicable in any **substation scheme**. The protection functions are suitable **for any neutral configuration**, solid-grounded, resistor-grounded, Petersen coil compensated and isolated.

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.

Making the Smart Grid Real

Characteristics

Saturation Detector

CT saturation detection is based on the current derivative. The detector modifies the overcurrent units operating principle when activated. Overcurrent units use instantaneous voltage besides RMS voltage, allowing for less strict CT requirements.

Directional Units

Directional units determine the direction of the fault in complex scenarios such as: zero voltage faults, voltage inversion faults in series compensated lines, faults in isolated or compensated neutral grids, and more.

Protection Schemes

Directional overcurrent units include DTT, PUTT, POTT, DCUB and DCB schemes, allowing instantaneous operation for faults inside 100% of the line.

Restricted Earth Fault

The REF unit detects transformer winding faults located very close to the neutral point. In addition to the neutral differential unit, the Restricted Earth Fault Unit includes a directional comparison unit that increases security against external faults with CT saturation. The IED has low and high impedance Restricted Earth Faults unit.

Protection Units

ANSI	Function	Uns.
50	Instantaneous Phase O/C	4
51	Time-delayed Phase O/C	4
50N	Instantaneous Neutral O/C	4
51N	Time-delayed Neutral O/C	4
50G	Instantaneous Ground O/C	4
51G	Time-delayed Ground O/C	4
50Q	Instantaneous Negative Sequence O/C	4
51Q	Time-delayed Negative Sequence O/C	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
67N	Neutral Directional	1
67G	Ground Directional	1
67Ns	Sensible Neutral Directional	1
67P	Positive-Sequence Directional	1
67Q	Negative Sequence Directional	1
67Ni/c	Isolated / Compensated Neutral Directional	1
85	Overcurrent Teleprotection Schemes	1
50FD	Fault Detector	1
	Phase Selector	1
46	Open Phase Detector	1
37	Time-Delayed Phase Undercurrent	1
27	Phase Undervoltage	4
59	Phase Overvoltage	4
59N	Neutral Overvoltage	4
64	Ground Overvoltage	4
47	Negative Sequence Overvoltage	1
49	Thermal Image	1
81M	Overfrequency	4
81m	Underfrequency	4
81D	Rate of Change of the Frequency	4
	Load Shedding	1
25	Synchronism Check Unit	1
32P/Q	Directional Power (active / reactive)	2
50BF	Breaker Failure Protection	1

ANSI	Function	Uns.
78	Out-of-Step	1
	Cold-Load	1
59V/Hz	Overexcitation	1
87N	Restricted Earth Faults Unit	1
60VT	VT Supervision and Fuse Failure Detector	1
60CT	CT Supervision	1
79	Recloser	1
	Sequence Coordination	1
3	Coil Supervision (Depending on the Hardware Selection)	
	Breaker Supervision	1
	Fault Locator	1
	Transducer Voltage Supervision	1
2	Pole Discrepancy	1
	Open Pole Detector	1
	Dead Line Detector	1
	Saturation Detector	1
	Harmonics Blocking	1

2 FRONT USB PORTS

2 REAR SERIAL PORTS

MODULAR DESIGN

UP TO 4 ETHERNET PORTS