



### GENERAL CHARACTERISTIC

Protection of voltage measuring bay dedicated to be used in MV network protection systems against voltage disturbances and to fulfill Under Frequency Load Shedding automation and Load Restoration after Under Frequency Load Shedding. The device integrates protection, measuring, control and register functions.

#### Protection set

27/59	under-/overvoltage, definite-time, three stage, three phase protection (AND/OR operation mode settable)
59N	residual overvoltage protection, three stages
47	negative-sequence overvoltage, two stages
27D	positive-sequence undervoltage, two stages
81	under-/overfrequency, instantaneous or definite-time, five stages
62	cooperation with external protection

#### Main features

- Under Frequency Load Shedding automation
- Load Restoration after Under Frequency Load Shedding automation
- Voltage interlocking of frequency-based protection
- four-inputs ( $U_n=100V$ ) or three-inputs ( $U_n=400V$ ) measuring system
- different types and variants depending on configuration
- measurement of analog input values
- real time clock
- event recorder with capacity up to 500 records
- last disturbance parameters recorder
- samples or magnitudes of disturbance and logic states recorder
- Tripped currents counter
- Two binary inputs for cooperation with external protection purposes, possibility to be used as blocking inputs
- Trip impulse
- alphanumeric LCD display (2x16) and six buttons enabling operation of the relay
- visual indication (by LED diodes) of pick-ups and trips, exceeding of counters or proper operation of relay
- 7 programmable relay outputs (S1-S7)
- RS-485 port for communication with PC computer or supervision and control system (MODBUS-RTU protocol)
- self-test system of proper operation of relay control
- enclosure construction enables three types of mounting: 35 mm rail, surface mount or flush mount

Energising values are measured input voltages:  $U_{L1}$ ,  $U_{L2}$ ,  $U_{L3}$ ,  $U_0$  and calculated values of positive-sequence of three phase voltage ( $U_1$ ), negative-sequence of three phase voltage ( $U_2$ ) and frequency. If one of measured or calculated values exceed the threshold value set by the user, the relay operates according to configuration.

Communication interface provides measured and calculated electrical values, binary inputs and outputs states and saved records. The manufacturer provides PC software allowing to set the relay, confirm signals, graphical display of measured values and browse records.

### TECHNICAL DATA

Rated measuring voltage $U_n$	100V/230V/400V
Rated frequency $f_n$	50 Hz
Auxiliary voltage	24, 48/60 V DC 110 V AC/DC 230 V AC/DC acc. to aux voltage
Control voltage	acc. to aux voltage
Setting range of threshold values of voltage for 27/27D/47/59 protection functions	0,05...1,20 $U_n$
Setting range of threshold value of frequency protections	40,0...65,0Hz
Setting range of operating time	0...99,9s
Number of underfrequency stages to pick-up UFLS automation	1...4
Number of overfrequency stages to pick-up Load Restoration after UFLS	1
Relay response time for	
• 27/27D/47/59 protection functions	≤40ms
• Relay response time for 59N protection function	≤100ms
Accuracy of voltage measuring	0,5% for $U=0,7...1,3 U_n$ 1% for $U=0,3...0,7 U_n$ 2,5% for $U=0,05...0,3 U_n$ 5% for rest of the measuring range
Accuracy of frequency measuring	±0,01Hz
Accuracy of time measuring	1% ±10ms
Burden in measuring inputs	≤0,5 VA/input
Burden of supply module	≤5W
Thermal withstand of voltage inputs - continuous	1,2 $U_n$ (1,2 $U_{0n}$ )
- short-term (10s)	1,44 $U_n$ (1,44 $U_{0n}$ )
Relay outputs data:	
Continuous contact carry	6A
Max. breaking capacity by 250V DC	
- resistive load	0,3A
- inductive load of $L/R \leq 40ms$	0,1A
Max. breaking capacity by 250V, 50Hz	
- inductive load, $\cos\phi=0,4$	3A
Ambient temperature	-20 – 55 °C
Humidity (with no condensation)	≤80%
Ingress Protection degree	IP40
Weight	~0,8kg
Dimensions (height x width x depth)	75mm x 100mm x 120mm
Electromagnetic compatibility acc. to	EN 60255-26
Insulation according to	EN 60255-5