

Transmission Line Protection

Selector Guide

FEATURES		ANSI	L90	L60	D90 ^{Plus}	D60	D30	
APPLICATIONS	Distance	21	•	•	•	•	•	
	Line Differential - Current Comparison	87L	•					
	Line Differential - Phase Comparison	87PC		•				
	Breaker-and-Half configurations		•	•	•	•		
	Series Compensation		•	•	•	•	•	
	Three terminal lines		•	•	•	•	•	
	Lines with in-zone transformers		•	•	•	•	•	
	Synchphasors		•	•	•	•	•	
	Typical Operating Time (cycles)		<1	<1	<1	<2	<2	
	Mho Phase & Ground Distance (No. of Zones)	21P/G	3	3	5	5	3	
PROTECTION & CONTROL	Quad Phase & Ground Distance (No. of Zones)	21P/G	3	3	5	5	3	
	IOC, Ground/Neutral/Phase/Negative Sequence	50G/N/P/_2	G/N/P/_2	G/N/P/_2	G/N/P/_2	G/N/P/_2	G/N/P/_2	
	TOC, Ground/Neutral/Phase/Negative Sequence	51G/N/P/_2	G/N/P/_2	G/N/P/_2	G/N/P/_2	G/N/P/_2	G/N/P/_2	
	Directional overcurrent, Neutral/Phase/Neg. Seq.	67G/N/P/_2	N/P/_2	N/P/_2	N/P/_2	N/P/_2	N/P/_2	
	Wattmetric Ground Directional		•	•	•	•	•	
	Overvoltage Phase/Auxiliary/Neutral	59P/X/N	P/X/N	P/X/N	P/X/N	P/X/N	P/X/N	
	Undervoltage Phase/Auxiliary	27P/X	P/X	P/X	P/X	P/X	P/X	
	Negative Sequence Overvoltage	59_2		•	•	•	•	
	Under/Over frequency	81U/O		•	•	•	•	
	Out-of-Step Blocking/Tripping	68B	•	•	•	•	•	
	Switch on to Fault (Line Pickup)	SOTF	•	•	•	•	•	
	Voltage Transformer Fuse Failure	VTF	•	•	•	•	•	
	Current Transformer Supervision		•	•	•	•	•	
	Open Pole Detector		•	•	•	•	•	
	Load Encroachment Logic		•	•	•	•	•	
	Breaker Failure	50BF	•	•	•	•	•	
	Breaker Flashover		•	•	•	•	•	
	Lockout Functionality	86	•	•	•	•	•	
	Synchronism Check or Synchronizing	25	•	•	•	•	•	
	AC Reclosing (No. of Shots)	79	4	4	4	4	4	
	Trip Modes: Three-Pole/Single-Pole		1&3	1&3	1&3	1&3	3	
	Pilot Protection Logic		POTT	POTT	•	•	•	
	Fault Location		•	•	•	•	•	
	AUTOMATION	Programmable Protection Logic (no of lines)		512	512	512	512	512
		Programmable Automation Logic (no of lines)				1024		
FlexElements™			•	•	•	•	•	
User Programmable Self-Test Contact			•	•	•	•	•	
Settings Groups			6	6	6	6	6	
Non-volatile latches (up to)			16	16	16	16	16	
Contact Inputs Programmable - (up to)			80	80	60	80	80	
Contact Outputs Programmable - (up to)			64	64	60	64	64	
Virtual Inputs - (up to)			32	32	32	32	32	
Virtual Outputs - (up to)			64	64	64	64	64	
Direct Inputs/Outputs			•	•	•	•	•	
Breaker Control (up to)			2	2	2	2	2	
User-Programmable LEDs (up to)			48	48		48	48	
User - Programmable Annunciator Alarms (up to)					96			
User-Programmable Push Buttons (up to)			12	12	12	12	12	
User-Programmable Self Test			•	•	•	•	•	
User Definable Displays			•	•	•	•	•	
Large HMI					•			
Timers			•	•	•	•	•	
Selector Switch			•	•	•	•	•	
Digital Counters			•	•	•	•	•	
Digital Elements			•	•	•	•	•	
IRIG-B Input			•	•	•	•	•	
Analog Inputs/Outputs (up to)			24	24		24	24	
RTD Inputs (up to)			24	24		24	24	
MONITORING & METERING	Current, voltage		•	•	•	•	•	
	Symmetrical Components		•	•	•	•	•	
	Power - Apparent, Real, Reactive		•	•	•	•	•	
	Energy		•	•	•	•	•	
	Power Factor		•	•	•	•	•	
	Frequency		•	•	•	•	•	
	Fault Location		•	•	•	•	•	
	Event Recorder - Number of Events		1024	1024	8000	1024	1024	
	Oscillography - Sampling Rate		64/5	64/5	128/30	64/5	64/5	
	Disturbance Recorder - Sampling Rate/Duration in seconds				1/300			
	Breaker Arcing Current		•	•	•	•	•	
	Trip/Close Coil Supervision		•	•	•	•	•	
	Data Logger		•	•	•	•	•	
	RS232 Port		•	•	•	•	•	
	COMM. INTERFACES	USB Port		•	•	•	•	
RS485 Port			•	•	•	•		
Ethernet Port (Fiber and Copper, up to)			1	1	3	1	1	
Direct Fiber Communications (800nm, 1330nm, 1550nm)			•	•	•	•	•	
Communication Interface (RS422, G.703, C37.94)			•	•	•	•	•	
PROTOCOLS	ModBus (RTU and TCP/IP)		•	•	•	•		
	DNP3		•	•	•	•		
	IEC60870-5-104		•	•	•	•		
	UCA2/MMS		•	•	•	•		
	IEC 61850		•	•	•	•		
	Simple Network Time Protocol (SNTP)		•	•	•	•		
	HTTP		•	•	•	•		
TFTP		•	•	•	•			

* For the most current comparison list, see www.GEMultilin.com/selector/transmission.pdf