

**Digital distance protection, control,
metering and analysis.**



DESCRIPTION

The MLP is a digital distance protection system. This powerful protection system is more cost effective than an installation using conventional equipment. Its main application is in subtransport and distribution lines of up to 66 kV and 132 kV for lines with three phase tripping, at distances of up to 150 km. Its capacity to register events, along with its control and monitoring capabilities, make it especially suitable for use in unattended substations, as it eliminates the need to send technicians to the site to collect data and reset the relay.

The protection functions include three phase directional distance protection zones for phase-to-phase faults and phase-to-ground faults with an additional zone dependent function on zone I (extended zone I). Measuring units are provided with the characteristics selectable between reactance with negative sequence polarization and variable mho for the detection of phase-to-ground faults in zone I, extended zone I, and zone II. Variable mho measuring units are provided for the detection of phase-to-phase faults in zone I, extended zone I, zone II, and all types of zone III faults. The MLP offers three-phase tripping in all zones.

The relay has three selectable protection schemes: step distance, zone I extension, and zone II acceleration (requires a communication channel). A three phase recloser is available. A fuse failure detector is provided in the voltage measuring circuits. An out of step blocking unit is provided. A remote open pole detector is available.

The MLP meters the instantaneous current and voltage values. It monitors local breaker operations, allowing breaker maintenance. It has a selectable current or power demand register which can store hourly values for up to 7 days. It has an event record that can store up to 240 events. A fault report is generated for each fault detected, and a fault locator is included. An oscillographic register is included which can store up to 7 records of 30 cycles each.

Local interface is via a 20 button keypad and a 2 line LCD display. Remote communication is available via an RS232 port or fiber optics. M-LINK software is provided with the relay.

The standard MLP comes with a test block. It is packaged in a 19 inch rack-mount case.

MLP

Digital Distance Protection

Applications

- Sub-transmission & distribution lines
- Three pole tripping
- Generator backup protection

Protection and Control

- Three zones of distance functions
- Step distance protection zones
- Zone I extension protection scheme
- Zone II acceleration
- Out of step blocking
- Line pick-up
- Remote open pole detector
- Fuse failure
- 3 shot programmable recloser
- 3 protection schemes

Monitoring and Metering

- Fault locator
- Fault reports
- Oscillography: 7 records, 30 cycles each
- Event record: up to 240 events
- Hourly power or current register: up to 7 days
- Supervision functions for breaker maintenance
- Real time monitoring of main quantities and states
- Self test functions

User Interfaces

- Keypad and display
- Communications via RS232 or fiber optics
- M-Link software provided

Features

- 19 inch drawout case



MLP TECHNICAL SPECIFICATIONS

METERING

Frequency:	50 or 60 Hz (selectable)
Rated Current:	1 or 5 A
Rated Phase to Phase Voltage:	110 VAC at 50 Hz 120 VAC at 60 Hz 48/125 VDC, $\pm 20\%$ 110/250 VDC, $\pm 20\%$
Auxiliary Voltage:	48/125 VDC, $\pm 20\%$ 110/250 VDC, $\pm 20\%$

INPUTS

THERMAL CAPACITY

Current Circuits:	
Continuous:	4 x I _n
Three sec:	50 x I _n
One sec:	100 x I _n
Voltage Circuits:	
Continuous:	2 x V _n
One min:	3.5 x V _n

COMMUNICATIONS

1 mm plastic Fiber Optics
100/140 or 50/125 Glass Fiber Optics

OUTPUTS

CONTACTS

Trip and Close:	
Make and Carry:	3000 W during 0.2 sec with a max of 35 A and 300 VDC
Carry Continuously:	8 A
Break:	150 W with a max of 8 A or 380 VDC max
Make/Break Delay:	10 ms/4 ms

AUXILIARY CONTACTS

Max Operating Power:	1760 VA
Max Operating Current:	8 A
Rated Current:	8 A
Max Operating Voltage:	250 VDC/380 VAC
Connection Time:	12 ms
Reclose Time:	10 ms

TRANSMISSION START CONTACT (REED RELAY)

Max Operating Voltage:	500 VDC
Max Operating Current:	0.5 A
Max Operating Power:	20 W
Make Delay:	0.5 ms

ENVIRONMENTAL

Ambient Temperature:	
Operation:	-20°C to +55°C
Storage:	-40°C to +65°C
Ambient Humidity:	up to 95% without condensation

TYPE TESTS

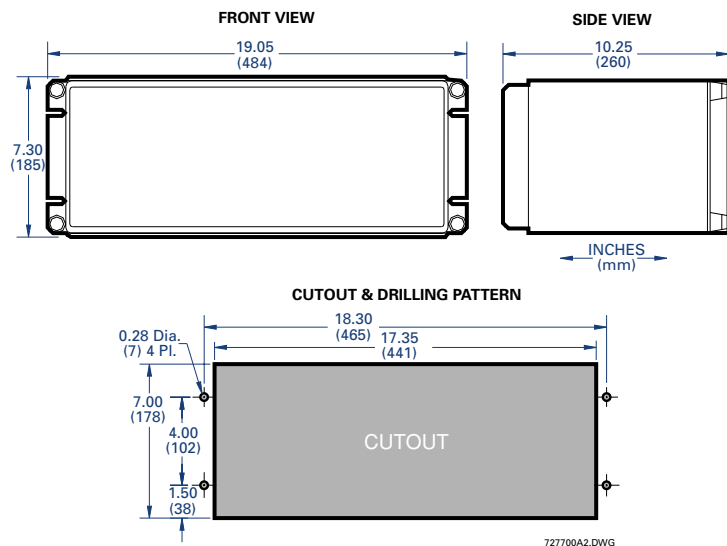
Dielectric Test:	2 kV, 50/60 Hz, 1 min
Voltage Withstand Test:	5 kV peak 0.5 J
1 MHz Interference Test:	Class III (IEC 255-22-1)
Electrostatic Discharge:	Class IV (IEC 255-22-2)
Radio Interference:	Class III (IEC 255-22-3)
Fast Transient:	Class III (IEC 255-22-4)

APPROVALS

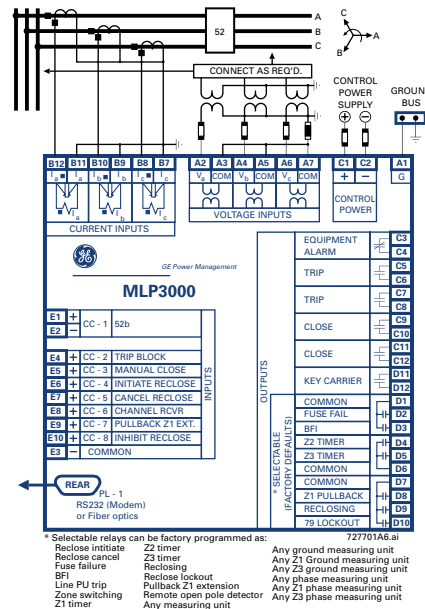
CE Compliant UL - UL listed for USA and Canada

*Specifications subject to change without notice.

DIMENSIONS



TYPICAL WIRING



ORDERING

To order select the basic model and the desired features from the Selection Guide below.

MLP 3 * * * M0 * 0 * 00 *

MLP	3	*	*	*	M0	*	0	*	00	*
0										Without test block (optional)
1										With test block (standard)
1										I _n = 1 A
5										I _n = 5 A
1										With keyboard and RS232
2										With keyboard and 1 mm plastic fiber optic
3										With keyboard and 100/140 glass fiber optic
4										With keyboard and 50/125 glass fiber optic
					0					48 VDC Vaux inputs
					1					125 VDC Vaux inputs
					2					220 VDC Vaux inputs
						G				Vaux = 48/125 VDC
						H				Vaux = 110/250 VDC
							B			Revision level

MLP3000:

- three distance protection zones
- step distance protection scheme
- zone I extension protection scheme
- out of step blocking
- fuse failure detection
- line pick-up
- event register
- current/power log
- fault report
- remote communications
- automatic reclosure
- remote open pole detector
- zone II acceleration
- fault locator
- oscillographic register