

M-PRO Microprocessor Relays - Specifications

Trip unit	M-PRO 17 Plus	M-PRO 18 Plus	M-PRO 30		M-PRO 40	
	NEW	NEW	L	H	L	H
Long Time Protection						
Pickup adjustable from 0.4 to 1.0x In in steps of 0.1	•	•			•	•
Pickup adjustable from 0.4 to 1.0x In in steps of 0.01			•	•		
Long Time Characteristic						
To IEC 947-4, Class 20	•	•			•	•
To IEC 947-4, Class 40 (& IEC255, 80 combinations)			•	•		
Fixed Short Time Protection						
1.5, 2, 3, 4, 5, 6, 8, 10 & 12 x Ir (frame 1 & 2 size)	•	•	•	•	•	•
1.5, 2, 3, 4, 6, 8 & 10 x Ir (frame 3 size only)	•	•				
Instantaneous Trip (Ii)						
OFF, 2, 3, 4, 6, 8, 10 & 12 x In (frame 1 & 2 size)	•	•				
OFF, 2, 3, 4, 6, 8 & 10 x In (frame 3 size only)	•	•				
Short time delay						
0.1, 0.2, 0.4, 0.5, 0.6, 0.8, 1.0s. (frame 1& 2 size)	•	•				
0.1, 0.2, 0.3, 0.4s. (frame 3 size only)	•	•				
Inst to 1.0s in 0.1 steps			•	•	•	•
Short time I²t Protection (Inverse Short Circuit)						
0.1 times selected long time			•	•	•	•
Pick-up, 1.5, 2, 3, 4, 6, 8, 10 and 12 x Ir			•	•	•	•
Neutral Protection						
Fixed Neutral Protection (50% or 100%)	0	0				
Adjustable Neutral Protection			•	•	•	•
Earth fault protection						
Unrestricted Earth Fault (UEF)	0	0	•	•	•	•
Restricted Earth Fault (REF)			0 ⁽¹⁾	0 ⁽¹⁾	•	•
Standby Earth Fault (SEF)			•	•	•	•
Combinations of UEF, REF & / or SEF			•	•	•	•
Earth fault pickup, OFF, 0.1 to 1.0x In. 0.01In steps			•	•	•	•
Earth fault pickup, OFF, 0.4 to 1.0x In. 0.2In steps	0	0	•	•	•	•
Time Delay: <100ms, 0.1, 0.2, 0.4, 0.6, 0.8 and 1.0s	0	0	•	•	•	•
Time Delay: Inst. To 1.0s in 0.1 steps			•	•	•	•
Earth fault cropping, 1 (OFF), 1.5, 2, 2.5, 3, 4, 5 and 6			•	•	•	•
Thermal Memory / Cooling Time						
Fixed to at time constant of 20 minutes	•(5)	•(5)				
Adjustable time constants, inst., 10,20,30,45,60,120,180 mins			•(5)	•(5)	•(5)	•(5)
Trip Indication						
Healthy Unit LED	•	•	•	•	•	•
Warning & / or Alarm LED			•	•	•	•
Discrete LED's for each fault type			•	•	•	•
Remote Indication (Fault code via communication facility)			0 ⁽²⁾	0 ⁽²⁾	•	•
Fault Analysis						
Existing Fault Notification		•	•	•	•	•
Historic Trips (last 16)			•	•	•	•
Historic Fault (last trip only)		•				
System Status						
Breaker Status		•	•	•	•	•
Auxiliary Power Supply	0	0	•	•	•	•
Output Relays						
Trip Initiated			•	•	•	•
HV Inter trip (linked to REF)			0 ⁽³⁾	0 ⁽³⁾	•	•
Watchdog/Watchdog disable (No output relay)			0	0	0	0
Remote ACB Switching (Open / Close via Comms. Unit)			0 ⁽²⁾	0 ⁽²⁾	0	0
Communications MODBUS Protocol						
Trip Reset						
Manual (Push Button) - Frame 1 & 2	•	•	•	•	•	•
Automatic - Frame 1 & 2	•	•	•	•	•	•
Monitoring						
Ammeters		•	•	•	•	•
Load Monitoring			•	•	•	•
Operations Counter			•	•	•	•
Trip Alarm Contact (mechanical C/O)	0	0	0	0	0	0
Main Contact Maintenance Indication			•(4)	•(4)	•	•
Inputs						
24-48V d.c.			•	•	•	•
110-130V d.c. or 110-250Va.c.			•	•	•	•
Auxiliary Power Supply	0	0	•	•	•	•
Plant Associated Memory Module (PAMM)						
Circuit Protection Memory			•	•	•	•
Test Connector						
16 way DIL Heater			•	•	•	•
26 way D-Type	•	•				

(1) M-PRO 30 units can be provided with REF as standard feature to replace UEF but please specify correct order code.
 (2) Remote indication becomes a standard feature when the Communications facility is specified.
 (3) Standard feature when Restricted Earth Fault option is specified.
 (4) Feature not available if communications option is specified.
 (5) Requires permanent auxiliary power to operate continuously.

L = Low voltage inputs
 H = High voltage inputs
 Standard •
 Optional 0

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New M-Pact Plus

Air Circuit Breakers
 New frame size up to 6300A

Standard features (Frames 1 & 2)

- Trip-free operating mechanism
- Positive ON/OFF contact indication
- Mechanical/electrical anti-pumping device
- Charging spring status indication (optional)
- Ergonomic manual spring charging handle
- Field-mountable range of accessories
- Auxiliary switches 5NO and 3NC, potential free 10A 250V (standard)
- Mechanical trip alarm switch (1NO) (optional)
- Padlockable push-button cover
- Mechanical cable interlocking (optional)
- Termination: rear, horizontal / front access (optional)
- Electrical clearances according to IEC 947-2
- Front access of secondary terminals for simple connection



GE imagination at work

Introducing the M-Pact Plus range of Air Circuit Breakers



Rated from 400 to 6300A the M-PACT Plus circuit breaker has been designed to meet the most stringent demands in fault detection and safe interruption thereof.

Available in 3 frame sizes:

- Frame size 1 ranging from 400 to 2500A
- Frame size 2 ranging from 800 to 4000A
- **Frame size 3 ranging from 5000 to 6300A** NEW

The range has been developed aesthetically and technically to co-ordinate with other protective devices within our company for industrial/domestic applications.

All 3 frame sizes have unique look available with both fixed pattern and drawout versions which can be manually or electrically operated. These ACBs are designed to offer multiple mains connection options it also comes with a wide range of easy-to-install accessories.

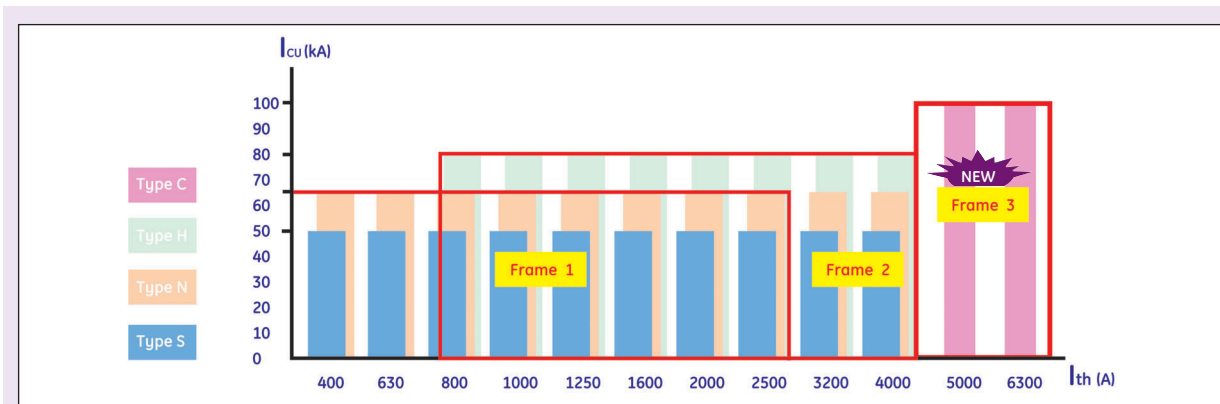
Specification

M-PACT Plus air circuit breakers comply with the following specifications for low voltage switchgear:

- IEC 947-1
- IEC 947-2
- IEC 947-3
- VDE 0660 Part 101 and Part 107
- Utilization category B

Approvals

LOVAG certification in accordance with IEC 947-2, BS EN 60947-2 ASTA, KEMA, CCC



3 compact frame sizes

Frame size 1 - 400 to 2500A
 Frame size 2 - 800 to 4000A
 Frame size 3 - 5000 to 6300A

- Frame 1 & 2
Fixed & withdrawable version is offered with 3 or 4 pole configuration, front and rear access connections (horizontal / vertical).
- Frame 3
Fixed and withdrawable version is offered with 3 Pole only, rear connections (horizontal/vertical)
- Devices provided with or without protection relay
- Manual or electrical operation and built-in safety features e.g. safety shutters

- Wide range of protection settings offering full selectivity combinations of earth fault protection with simple & easy service on site

4 performance ranges⁽¹⁾

Type S - 50 kA I_{cu} = I_{cs} = I_{cw}
 Type N - 65 kA I_{cu} = I_{cs} = I_{cw}
 Type H - 80 kA I_{cu} = I_{cs} = I_{cw}
 Type C⁽²⁾ - 100 kA I_{cu} = I_{cs} = I_{cw}

(1) Ratings shown at 500V AC
 (2) Ratings shown at 690V AC
 Memory available on request

Introducing the M-PRO Plus protection relay

The M-PRO plus range of protection relay is the latest range of advanced protection relay to compliment the M-Pact Plus air circuit breaker. The relay incorporates the unique features and benefits that have been proven with M-PRO but is an enhanced design for improved reliability, performance and application purposes.

The four types of protection units are M-PRO 17 plus, M-PRO 18 plus, M-PRO 30 and M-PRO 40 units.

Each M-PRO unit has specific features and benefits dependant on the type of installation and application required by the user. This range provides inter-changeability essential when upgrading circuits and providing limited down time for essential services.

M-PRO Plus has retained the innovative measurement coils which due to their high accuracy and power ensure M-PRO Plus is self powered even when loads are very low.



The **M-PRO17 Plus** provides basic overcurrent and short-circuit protection with simple rotary switches for adjustment and clear indication of protection settings. Protection settings now available as low as 1.5 x I_r for improved selectivity and co-ordination. 'M-PRO17 Plus' has the additional option of Earth fault protection.

Also introducing the new **M-PRO18 Plus** with the same protection functions as 'M-PRO17 Plus' but complete with a digital display. For ease of reference this unit also has a back light facility providing clear indication of the digital display. 'M-PRO18 Plus' has the additional option of Earth fault protection.

The **M-PRO 30 and 40** units have a unique and innovative memory system enabling circuit protection settings and historical data to be stored remote from the associated circuit breaker.

Depending on the type of M-PRO Plus unit specified (see selection table) the following features are available:

- Adjustable protection curves
- Auxiliary power inputs
- Earth Fault Protection (unique combinations)
- Neutral Protection (fixed or adjustable)
- Ammeter (multi functions)
- Thermal Memory
- Historical Tripping data with real time
- Reset Switch (manual and auto available)
- LCD display (with timed backlit function)
- Multiple adjustment and fault indication
- Programmable inputs/outputs
- Communication facility
- Alarm contact
- Mechanical Alarm Contact (optional)
- Load monitoring
- Making Contact Release (50kA)