

Air Circuit Breaker (ACB)



Rated from 800 to 4000A the M-PACT circuit breaker has been designed to meet the most stringent demands in fault detection and safe interruption thereof. Available in 2 frame sizes:

- frame size 1 ranging from 800 to 2500A
- frame size 2 ranging from 800 to 4000A

The range has been developed to be aesthetically and technically co-ordinated with other protective devices within the GE Power Controls industrial product ranges.

The breaker range has a common height and depth and is available in both fixed pattern and drawout versions which can be manually or electrically operated. Designed to offer multiple mains connection options it also comes with a wide range of easy-to-install accessories.

3 performance ranges*

S – 50 kA (Icu)

N – 65 kA (Icu)

H – 80 kA (Icu)

*Ratings shown at 500V AC

2 compact frame sizes

Frame size 1 - 800 to 2500A

Frame size 2 - 800 to 4000A

Fixed pattern and withdrawable versions

3 or 4 pole configuration

Front and rear access connections

(horizontal / vertical)

Devices provided with or without protection relay

Manual or electrical operation

Common height and depth dimensions

Built-in safety features e.g. safety shutters

Wide range of protection settings offering full selectivity

Combinations of earth fault protection

Easy-to-install accessories, common to entire range

Simple and efficient servicing on site

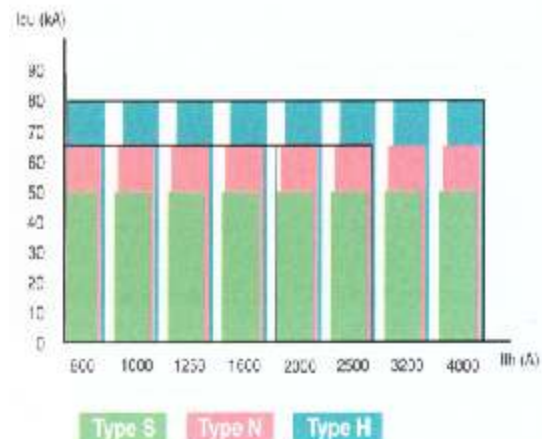
Specification

M-PACT air circuit breakers comply with the following specifications for Low Voltage Switchgear:

- IEC 947-1
- IEC 947-2
- IEC 947-3
- BS EN 60947-2
- VDE 0660 Part 101 and Part 107
- Utilisation category B

Approvals

ASTA / KEMA & LOVAG certification in accordance with IEC 947-2/ BS EN 60947-2.





M-PACT

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M-PRO Microprocessor Protection Relays - Specifications

M-PRO	17	20	30		40	
			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 40 (& IEC 255, 80 combinations)		●	●	●	●	●
• To IEC 947-4, Class 20	●					
Short Time Protection						
• 2, 3, 4, 6, 8, 10, 12x Ir	●					
• 1.5, 2, 3, 4, 6, 8, 10, 12x Ir		●	●	●	●	●
Short Time Delay						
• Instantaneous, 0.1,0.2, 0.4,0.6,0.8,1.0s						
• Instantaneous to 1.0s in 0.1 steps		●	●	●	●	●
Short Time I²t Cropping						
• 0.1 times selected long time		●	●	●	●	●
• Pick-up, 1.5, 2, 3, 4, 6, 8, 10 and 12 x Ir		●	●	●	●	●
Neutral Protection						
	○(1)	○	●	●	●	●
Earth fault protection						
• Unrestricted (UEF)	○(1)		●	●	●	●
• Restricted (REF)			○	○	●	●
• Standby (SEF)			○	○	●	●
• Earth fault pickup, OFF,0.4 to 1.0x In. 0.2 In steps	○		●	●	●	●
• Earth fault pickup OFF 0.1 to 1.0x In 0.01 In steps			●	●	●	●
• Time delay, Instantaneous to 1.0 sec. 0.1 steps	○		●	●	●	●
• Earth fault cropping, 1 (OFF), 1.5, 2, 2.5,3,4,5 and 6	○		●	●	●	●
Thermal Memory						
• Fixed to at time constant of 20 minutes	●(5)					
• Adjustable time constants, inst., 10, 20, 30, 45, 60, 120, 180 minutes		●	●	●	●	●
Trip Indication						
• Healthy Unit LED	●	●	●	●	●	●
• Warning/ Alarm LED		●	●	●	●	●
• Discrete LED's for each fault type		●	●	●	●	●
• Fault codes (via Communication unit)			○(2)	○(2)	●	●
Output Relay						
• Load Monitoring			●	●	●	●
• Trip Initiated			●	●	●	●
• Maintenance (main contacts)			●	●	●	●
HV Inter trip (linked to REF)						
• Remote ACB switching (Open / Close via Comms Unit)			○(3)	○(3)	●	●
Communications MODBUS protocol						
			○(2)	○(2)	○	○
Trip Reset						
• Manual (push button)	●	●	●	●	●	●
• Automatic		●	●	●	●	●
Other Optional Features						
• Trip Alarm Contacts (mechanical C/O)	○	○	○	○	○	○
• Watchdog / Watchdog disable		○	○	○	○	○
• Auxiliary Power Unit		○	●	●	●	●
• Ammeter		●	●	●	●	●
• Operations counter		●	●	●	●	●
• Trip History (previous 16 trips)		●	●	●	●	●
• Main Contact Maintenance Indication			○(4)	○(4)	●	●
Inputs (Programmable)						
• 24 - 48V DC			●		●	
• 110-130V DC or 110-250V AC				●		●
Connectors						
• Small connector	●					
• Large connector		●	●	●	●	●
Test Connector						
• 15 way D-type	●					
• 16 way DIL heater		●	●	●	●	●

(1) Only UEF or neutral protection option (not both)
 (2) Standard feature when communications option is specified
 (3) Standard feature when Restricted Earth Fault option is specified
 (4) Feature not available if communications option is specified
 (5) Auxiliary power unit required

● Standard feature
 ○ Optional feature
 L = low voltage inputs
 H = higher voltage inputs



M-PACT

Characteristics

Performance Data									
Characteristic	Symbol	Units							
Rated current (40°C)	In	A	800			1000			
Endurance (number of operating cycles)									
Mechanical (with maintenance)			20000			20000			
Mechanical (without maintenance)			10000			10000			
Electrical (at rated current)			5000			5000			
Rated service voltage (50/60 Hz)	Ue	V	690			690			
Rated insulation voltage (50/60 Hz)	Ui	V	1000			1000			
Rated impulse withstand voltage	Uimp	V	8000			8000			
Number of poles			3 & 4			3 & 4			
Rating of 4th pole			100%			100%			
ACB type			S	N	H	S	N	H	
Frame size			1	1	2	1	1	2	
Rated ultimate short-circuit	Icu	kA (rms)	220V	50	65	80	50	65	80
Breaking capacity			415V	50	65	80	50	65	80
			500V	50	65	80	50	65	80
			600V	50	50	65	50	50	65
			690V	40	40	60	40	40	60
Rated service short-circuit	Ics	kA (rms)	220V	50	65	80	50	65	80
Breaking capacity			415V	50	65	80	50	65	80
			500V	50	65	80	50	65	80
			600V	50	50	65	50	50	65
			690V	40	40	60	40	40	60
Rated short time withstand current									
1 second	Icw	kA (rms)		50	65	80	50	65	80
3 seconds	Icw	kA (rms)		40	50	50	40	50	50
Rated short-circuit making capacity	Icw	kA (peak)	415V	143	143	176	143	143	176
			500V	143	143	176	143	143	176
			600V	143	105	143	105	105	143
			690V	84	84	105	84	84	105
Power dissipation at In (Fixed breaker)		Watts		63	43	23	106	68	36
Power dissipation at In (Withdrawable)		Watts		127	86	49	211	135	77

Selectivity

The following table shows the conditions to satisfy full selectivity between UP-STREAM and DOWN-STREAM devices.

Up-stream: M-PACT

Down-stream: M-PACT

ST delay 50 ms minimum between up-stream and down-stream ACB Multiplication coefficient between LT-ratings > 1,56

		Down-Stream							
		800	1000	1250	1600	2500	2000	3200	4000
Up-Stream	800	-	-	-	-	-	-	-	-
	1000	-	-	-	-	-	-	-	-
	1250	Full	-	-	-	-	-	-	-
	1600	Full	Full	-	-	-	-	-	-
	2000	Full	Full	Full	-	-	-	-	-
	2500	Full	Full	Full	Full	-	-	-	-
	3200	Full	Full	Full	Full	Full	-	-	-
	4000	Full	Full	Full	Full	Full	Full	-	-

Up-stream: M-PACT

Down-stream: RECORD or SPECTRA

ST delay 50 ms minimum on M-PACT

Multiplication coefficient between LT ratings

Down-stream		LT coefficient
Spectra	All ratings	2
Record	≤250A	2
	250A <500A	2.5
	500A <1250A 3	3

Temperature Deratings

Free Air(1)

The M-PACT ACBs may operate at higher ambient temperatures than 40°C in certain installation conditions. In this case the current rating in Amperes should be reduced as indicated below.

Ambient temperature	Current Rating (A)							
	800	1000	1250	1600	2000	2500	3200	4000
50°C	800	1000	1250	1600	2000	2450	3200	3727
60°C	800	1000	1250	1445	2000	2232	3200	3367
65°C	800	1000	1250	1364	2000	2092	3019	3175
70°C	800	1000	1250	1280	1970	1970	2831	2978

The figures specified apply to withdrawable ACB's with flat face vertical copper connections

(1) Protection degree IP00. For use in enclosures with interior temperatures of 40°C to 70°C the relevant IP values can be applied.



M-PACT

Characteristics

1250			1600			2000			2500			3200			4000		
20000			20000			20000			20000			20000			20000		
10000			10000			10000			10000			10000			10000		
5000			5000			5000			5000			5000			5000		
690			690			690			690			690			690		
1000			1000			1000			1000			1000			1000		
8000			8000			8000			8000			8000			8000		
3 & 4 100%			3 & 4 100%			3 & 4 100%			3 & 4 100%			3 & 4 100%			3 & 4 100%		
S	N	H	S	N	H	S	N	H	S	N	H	S	N	H	S	N	H
1	1	2	1	1	2	1	1	2	1	1	2	2	2	2	2	2	2
50	65	80	50	65	80	50	65	80	50	65	80	50	65	80	50	65	80
50	65	80	50	65	80	50	65	80	50	65	80	50	65	80	50	65	80
50	65	80	50	65	80	50	65	80	50	65	80	50	65	80	50	65	80
50	50	65	50	50	65	50	50	65	50	50	65	50	50	65	50	50	65
40	40	60	40	40	60	40	40	60	40	40	60	40	40	60	40	40	60
50	65	80	50	65	80	50	65	80	50	65	80	50	65	80	50	65	80
50	65	80	50	65	80	50	65	80	50	65	80	50	65	80	50	65	80
50	65	80	50	65	80	50	65	80	50	65	80	50	65	80	50	65	80
50	50	65	50	50	65	50	50	65	50	50	65	50	50	65	50	50	65
40	40	60	40	40	60	40	40	60	40	40	60	40	40	60	40	40	60
50	65	80	50	65	80	50	65	80	50	65	80	50	65	80	50	65	80
40	50	50	40	50	50	40	50	50	40	50	50	40	50	50	40	50	50
143	143	176	143	143	176	143	143	176	143	143	176	143	143	176	143	143	176
143	143	176	143	143	176	143	143	176	143	143	176	143	143	176	143	143	176
105	105	143	143	105	143	143	105	143	143	105	143	143	105	143	143	105	143
84	84	105	84	84	105	84	84	105	84	84	105	84	84	105	84	84	105
175	105	60	287	196	98	224	224	163	351	351	255	418	418	418	571	571	571
351	211	128	574	392	209	490	490	347	765	765	542	888	888	888	1224	1224	1224

Rated Short-Circuit Capacity

In accordance with IEC 947-2 at 415V

Breaker Range	Rating (A)	Type	Icu	Ics	Icw (1 sec.)
S	800 to 1600	Fixed or Withdrawable	50kA	50kA	50kA
N	800 to 4000	Fixed or Withdrawable	65kA	65kA	65kA
H	800 to 4000	Fixed or Withdrawable	80kA	80kA	80kA

Recommended Minimum Copper Size

In accordance with IEC 947-2

Rating (A)	Copper/phase
800	2 x 50 x 5
1000	2 x 60 x 5
1250	2 x 100 x 5
1600	2 x 100 x 5
2000	3 x 100 x 5
2500	4 x 100 x 5
3200	4 x 100 x 10
4000	4 x 100 x 10 + 1 x 100 x 5

Dimension In mm

In accordance with IEC 947-2 at 415V

Frame Size	Rating (A)	Poles	Type	Height ⁽¹⁾	Width	Depth ⁽²⁾
1	800 to 2250	3	Withdrawable	440	329	390
			Fixed	430	322	328
		4	Withdrawable	440	429	390
			Fixed	430	429	328
2	800 to 3200	3	Withdrawable	440	419	392
			Fixed	430	419	328
		4	Withdrawable	440	549	392
			Fixed	430	549	328
2	4000	3	Withdrawable	440	419	482
			Fixed	430	419	328
		4	Withdrawable	440	549	482
			Fixed	430	549	328

Air Circuit Breaker - TYPE S (50 kA)

Basic circuit breaker manually operated, non automatic, 5 NO and 3 NC auxiliary switches.

Withdrawable pattern 7 basic circuit breaker and cassette with flat copper terminals rear connected. Fixed pattern basic circuit breaker with rear terminals horizontal.



Withdrawable Pattern

Frame Size	Rating (A)	Poles	Cat. No.	Code No.
1	800	3	MS31W08	401405107
		4	MS41W08	401405106
1	1000	3	MS31W10	401405109
		4	MS41W10	401405108
1	1250	3	MS31W12	401405111
		4	MS41W12	401405110
1	1600	3	MS31W16	401405113
		4	MS41W16	401405112
1	2000	3	MS31W20	401405115
		4	MS41W20	401405114
1	2500	3	MS31W25	401405117
		4	MS41W25	401405116
2	3200	3	MS32W32	401405123
		4	MS42W32	401405122
2	4000	3	MS32W40	401405125
		4	MS42W40	401405124

Fixed Pattern



Frame Size	Rating (A)	Poles	Cat. No.	Code No.
1	800	3	MS31F08	401405137
		4	MS41F08	401405136
1	1000	3	MS31F10	401405139
		4	MS41F10	401405138
1	1250	3	MS31F12	401405141
		4	MS41F12	401405140
1	1600	3	MS31F16	401405143
		4	MS41F16	401405142
1	2000	3	MS31F20	401405145
		4	MS41F20	401405144
1	2500	3	MS31F25	401405147
		4	MS41F25	401405146
2	3200	3	MS32F32	401405153
		4	MS42F32	401405152
2	4000	3	MS32F40	401405155
		4	MS42F40	401405154

Air Circuit Breaker - TYPE N (65 kA)

Basic circuit breaker manually operated, non automatic, 5 NO and 3 NC auxiliary switches.

Withdrawable pattern 7 basic circuit breaker and cassette with flat copper terminals rear connected. Fixed pattern basic circuit breaker with rear terminals horizontal.



Withdrawable Pattern

Frame Size	Rating (A)	Poles	Cat. No.	Code No.
1	800	3	MN31W08	401405167
		4	MN41W08	401405166
1	1000	3	MN31W10	401405169
		4	MN41W10	401405168
1	1250	3	MN31W12	401405171
		4	MN41W12	401405170
1	1600	3	MN31W16	401405173
		4	MN41W16	401405172
1	2000	3	MN31W20	401405175
		4	MN41W20	401405174
1	2500	3	MN31W25	401405177
		4	MN41W25	401405176
2	3200	3	MN32W32	401405183
		4	MN42W32	401405182
2	4000	3	MN32W40	401405185
		4	MN42W40	401405184



Fixed Pattern

Frame Size	Rating (A)	Poles	Cat. No.	Code No.
1	800	3	MN31F08	401405197
		4	MN41F08	401405196
1	1000	3	MN31F10	401405199
		4	MN41F10	401405198
1	1250	3	MN31F12	401405201
		4	MN41F12	401405200
1	1600	3	MN31F16	401405203
		4	MN41F16	401405202
1	2000	3	MN31F20	401405205
		4	MN41F20	401405204
1	2500	3	MN31F25	401405207
		4	MN41F25	401405206
2	3200	3	MN32F32	401405213
		4	MN42F32	401405212
2	4000	3	MN32F40	401405215
		4	MN42F40	401405214

Air Circuit Breaker - TYPE H (80 kA)

Basic circuit breaker manually operated, non automatic, 5 NO and 3 NC auxiliary switches.

Withdrawable pattern 7 basic circuit breaker and cassette with flat copper terminals rear connected. Fixed pattern basic circuit breaker with rear terminals horizontal.



Withdrawable Pattern

Frame Size	Rating (A)	Poles	Cat. No.	Code No.
1	800	3	MH32W08	401405227
		4	MH42W08	401405226
1	1000	3	MH32W10	401405229
		4	MH42W10	401405228
1	1250	3	MH32W12	401405231
		4	MH42W12	401405230
1	1600	3	MH32W16	401405233
		4	MH42W16	401405232
1	2000	3	MH32W20	401405235
		4	MH42W20	401405234
1	2500	3	MH32W25	401405237
		4	MH42W25	401405236
2	3200	3	MH32W32	401405243
		4	MH42W32	401405242
2	4000	3	MH32W40	401405245
		4	MH42W40	401405244

Fixed Pattern



Frame Size	Rating (A)	Poles	Cat. No.	Code No.
1	800	3	MH32F08	401405257
		4	MH42F08	401405256
1	1000	3	MH32F10	401405259
		4	MH42F10	401405258
1	1250	3	MH32F12	401405261
		4	MH42F12	401405260
1	1600	3	MH32F16	401405263
		4	MH42F16	401405262
1	2000	3	MH32F20	401405265
		4	MH42F20	401405264
1	2500	3	MH32F25	401405267
		4	MH42F25	401405266
2	3200	3	MH32F32	401405273
		4	MH42F32	401405272
2	4000	3	MH32F40	401405275
		4	MH42F40	401405274



Electrical Accessories



	Range	Voltage	Code No.
Shunt Trip (ST)			
ST220	220/250V	AC/DC	401405388
Motor Operator (MT)			
MOP220A	220/250V	AC	401405448
Closing Coil (CC)			
CC220	220/250V	AC/DC	401405428
Under Voltage Release (UV)			
UV220	220/250V	AC	401405408
Under Voltage Release Time Delayed (UVTD)			
UVTD220	220/250V	AC	401405411

Mechanical Interlock

2 way interlocking				Type A		1 from 3 way Interlocking			Type B		
Frame size	Type	Poles	Cable Cat. No.	Frame size	Type	Poles	Cable Cat. No.	Frame size	Type	Poles	Cable Cat. No.
1 & 2	Withdrawable	3	2WC13PW	1 & 2	Withdrawable	3	B13WC13PW	1 & 2	Withdrawable	3	B13WC13PW
		4	2WC14PW			4	B13WC14PW			4	B13WC14PW
	Fixed	3	2WC13PF		Fixed	3	B13WC13PF		Fixed	3	B13WC13PF
		4	2WC14PF			4	B13WC14PF			4	B13WC14PF

2 way interlocking				Type C		Type D		Cable length for interlock	
Frame size	Type	Poles	Cable Cat. No.	Cable Cat. No.	Cable Cat. No.	Item	Cat. No.	Cable length	Cat. No.
1 & 2	Withdrawable	3	C23WC13PW	D23WC13PW	D23WC13PW	1.6 metre length cable	160BCMCI		
		4	C23WC14PW	D23WC14PW	D23WC14PW	2.0 metre length cable	200BCMCI		
	Fixed	3	C23WC13PF	D23WC13PF	D23WC13PF	3.0 metre length cable	300BCMCI		
		4	C23WC14PF	D23WC14PF	D23WC14PF				

M-Pro Optional Protection

M-Pro Optional Protection	Cat. No.	Code No.
Unrestricted Earth Fault for M-PRO 17	MPROUEF	401405536
Trip Alarm switch 1 NO	MPROMAC	410405575