GE
Consumer & Industrial

M-PACT New

Air Circuit Breaker 400-4000A

GE imagination at work

M-PACT

Air Circuit Breaker
400-4000A

Air circuit breakers 400A-4000A

Technical overview

Notes

Rated from 400 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 400 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.

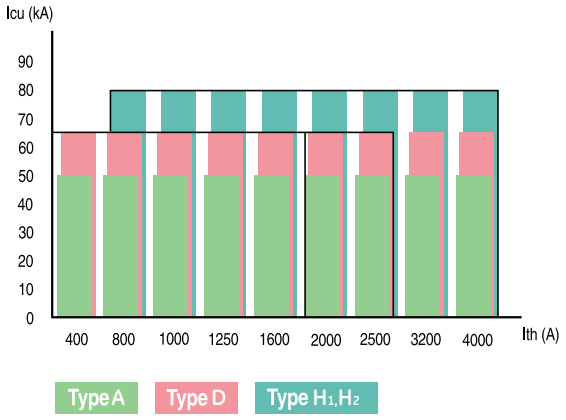
Specification

M-PACT air circuit breakers comply with the following specifications for Low Voltage Switchgear:
- IEC 60947-1
- IEC 60947-2
- IEC 60947-3
- Utilisation category B

Approvals

KEMA certification in accordance with IEC 60947-2
CCC certification in accordance with GB14048-2
CCS certification in accordance with China Certification of shipping

3 performance ranges*
A -50 kA (Icu)
D -65 kA (Icu)
H1, H2 -80 kA (Icu)
*Ratings shown at 415V AC
2 compact frame sizes
Frame size 1 - 400 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



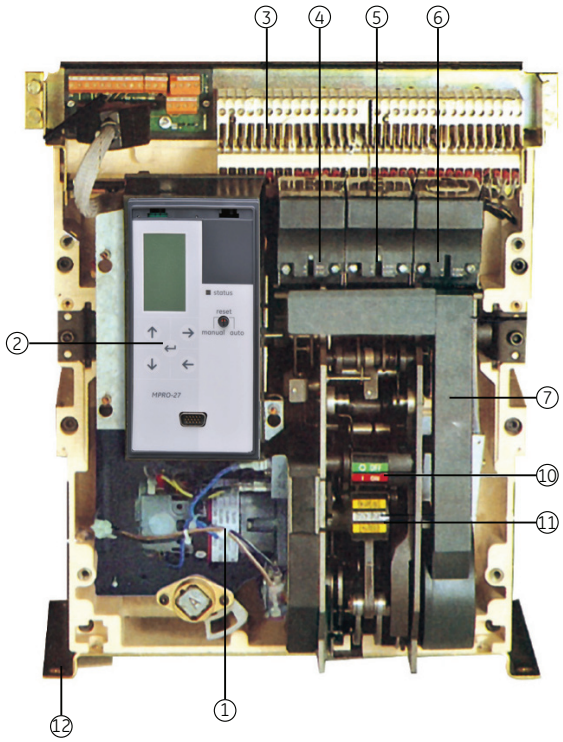
Fixed circuit breaker

All M-PACT fixed pattern air circuit breakers incorporate a stored energy mechanism. The spring can be charged either manually or electrically via a motor operator that is automatically activated after the closing operation.
IP43 front panel and door escutcheon seals are standard features with IP20 protected secondary isolating contacts. For enhanced protection, an optional
IP54 door panel is also available.

- 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 5 NO and 3 NC, 10A 250V (standard)
- Mechanical Trip Alarm switch (1NO) (optional)
- Padlockable push-button cover
- Mechanical cable interlocking (optional)
- Termination: rear, horizontal or front access (optional)
- Electrical clearances according to IEC60947-2
- Front access of secondary terminals for simple connection

Power Supply

All stated short circuit ratings are certified with incoming supply connection made to either upper or lower terminals.



1. Motorised spring charging unit (optional)
2. M-PRO Protection Relay (optional)
3. Secondary contacts
4. Shunt trip (optional)
5. Closing coil (optional)
6. Undervoltage release (optional)
7. Manual charging handle
8. ON/OFF push-buttons
9. Push-button padlockable covers
10. Positive contact indication
11. Charging spring status indication
12. Mounting plate

Installation

Fixed pattern M-PACT can be fastened into any suitable switchboard or cubicle arrangement using four M8 bolts. Clearance is only required above the unit for the removal and inspection of the arc chutes (see dimensional drawings for mounting details and recommended clearance distances).
An earthing point is provided on either side of the circuit breaker.

Withdrawable circuit breaker

Pre-mounted into a self-contained 'cassette', this versatile circuit breaker can be inserted or withdrawn via sliding rails using a racking drive mechanism controlled by a racking handle.
It provides three set positions:
Disconnected / Test / Connected.
Any attempt to withdraw the unit whilst in service will automatically trip the breaker, either by the racking position safety mechanism or by the insertion of the racking handle. It can be racked to the dis-connected position with the cubicle door closed or open.

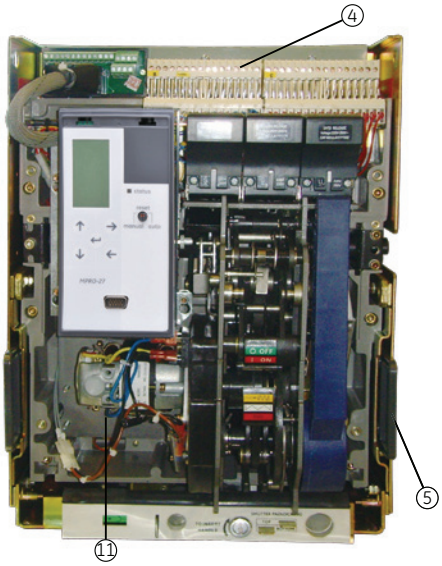
- Insulated, earthed steel shutters to isolate the main contact zone
- Front access padlocking for safety shutters
- Secure padlocking in the "Disconnect" position
- Clearly visible operational position indication
- Carriage position switch (optional)
- Termination: Flat copper palms (standard) with captive M10 fixing nuts
- 'T' terminal adaptors for horizontal/vertical connection (optional)
- Front access connections (optional)
- Automatic disconnect of secondary circuits
- Lifting lugs for ease of removing the circuit breaker from the cassette
- Front access of secondary terminals for simpleconnection
- Cassette side mounting fixing parts (optional)

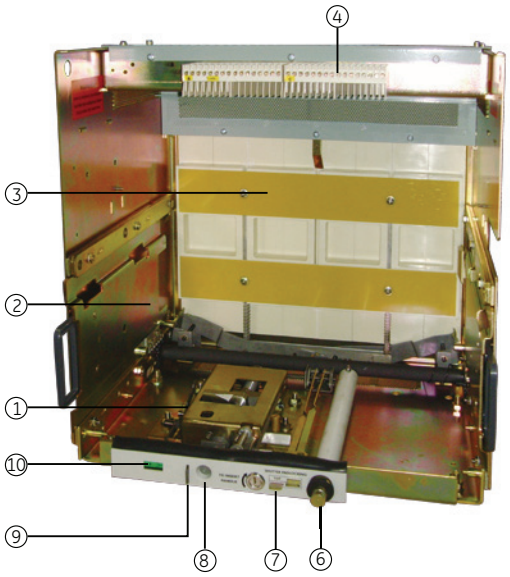
Installation

Circuit breakers are delivered pre-mounted in the cassette (standard)
Versatile fixing arrangements allow mounting onto any switchboard or cubicle using four M8 bolts (see dimensional drawings for mounting details and recommended clearance distances)
Earthing point situated on the right hand side of cassette (front view)

Power Supply

All stated short circuit ratings are certified with incoming supply connection made to either upper or lower terminals.





1. Carriage position switch (optional)
2. Extension rail
3. Earthed steel safety shutter
4. Secondary terminals
5. 2 way cable interlock mechanism (optional)
6. Racking handle (storage)
7. Padlocking for safety shutters
8. Insertion hole for racking handle
9. Padlocking in the DISCONNECTED position
10. Operational position indication
11. Key interlock (optional)

Characteristics

Performance Data

Characteristic	Symbol	Units		400		800				1000				1250			
Endurance (number of operating cycles)																	
Mechanical (with maintenance)				20000		20000				20000				20000			
Mechanical (without maintenance)				10000		10000				10000				10000			
Electrical (at rated current)				5000		5000				5000				5000			
Rated service voltage (50/60 Hz)	Ue	V		415	690	415	690	415	690	415	690	415	690	415	690	415	690
Rated insulation voltage (50/60 Hz)	Ui	V		1000		1000				1000				1000			
Rated impulse withstand voltage	Uimp	V		8000		8000				8000				8000			
Number of poles				3 & 4		3 & 4				3 & 4				3 & 4			
Rating of 4th pole				100%		100%				100%				100%			
ACB type				A	D	A	D	H1	H2	A	D	H1	H2	A	D	H1	H2
Frame size				1	1	1	1	2	2	1	1	2	2	1	1	2	2
Rated ultimate short-circuit	Icu	kA (rms)	220V	50	65	50	65	80	80	50	65	80	80	50	65	80	80
breaking capacity			415V	50	65	50	65	80	80	50	65	80	80	50	65	80	80
			500V	-	65	-	65	-	80	-	65	-	80	-	65	-	80
			600V	-	50	-	50	-	65	-	50	-	65	-	50	-	65
			690V	-	40	-	40	-	60	-	40	-	60	-	40	-	60
Rated service short-circuit	Ics	kA (rms)	220V	50	65	50	65	80	80	50	65	80	80	50	65	80	80
breaking capacity			415V	50	65	50	65	80	80	50	65	80	80	50	65	80	80
			500V	-	65	-	65	-	80	-	65	-	80	-	65	-	80
			600V	-	50	-	50	-	65	-	50	-	65	-	50	-	65
			690V	-	40	-	40	-	60	-	40	-	60	-	40	-	60
Rated short time withstand current																	
1 second	Icw	kA (rms)		50	50	50	50	65	80	50	50	65	80	50	50	65	80
3 seconds	Icw	kA (rms)		40	50	40	50	50	50	40	50	50	50	40	50	50	50
Rated short-circuit making capacity	Icm	kA (peak)	415V	105	143	105	143	176	176	105	143	176	176	105	143	176	176
			500V	-	143	-	143	-	176	-	143	-	176	-	143	-	176
			600V	-	105	-	105	-	143	-	105	-	143	-	105	-	143
			690V	-	84	-	84	-	105	-	84	-	105	-	84	-	105
Power dissipation at In (Fixed breaker)		Watts		15	10	63	43	23	20	106	68	36	32	175	105	60	53
Power dissipation at In (Withdrawable)		Watts		30	21	127	86	49	43	211	135	77	68	351	211	128	113

Design and specifications are subject to changes without notice.

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 downstream ACB Multiplication coefficient between LT-ratings≥1,56

Up-stream \ Down-stream	-	400	800	1000	1250	1600	2000	2500	3200	4000
-	-	400	800	1000	1250	1600	2000	2500	3200	4000
400	-	-	-	-	-	-	-	-	-	-
800	Full	-	-	-	-	-	-	-	-	-
1000	Full	-	-	-	-	-	-	-	-	-
1250	Full	Full	-	-	-	-	-	-	-	-
1600	Full	Full	Full	-	-	-	-	-	-	-
2000	Full	Full	Full	Full	-	-	-	-	-	-
2500	Full	Full	Full	Full	Full	Full	Full	-	-	-
3200	Full	Full	Full	Full	Full	Full	Full	-	-	-
4000	Full	Full	Full	Full	Full	Full	2000	Full	-	-

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.

1600				2000				2500				3200				4000			
20000				20000				20000				20000				20000			
10000				10000				10000				10000				10000			
5000				5000				5000				5000				5000			
415	690	415	690	415	690	415	690	415	690	415	690	415	415	415	690	415	415	415	690
1000				1000				1000				1000				1000			
8000				8000				8000				8000				8000			
3 & 4				3 & 4				3 & 4				3 & 4				3 & 4			
100%				100%				100%				100%				100%			
A	D	H1	H2	A	D	H1	H2	A	D	H1	H2	A	D	H1	H2	A	D	H1	H2
1	1	2	2	1	1	2	2	1	1	2	2	2	2	2	2	2	2	2	2
50	65	80	80	50	65	80	80	50	65	80	80	50	65	80	80	50	65	80	80
50	65	80	80	50	65	80	80	50	65	80	80	50	65	80	80	50	65	80	80
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-	50	-	65	-	50	-	65	-	50	-	65	-	-	-	65	-	-	-	65
-	40	-	60	-	40	-	60	-	40	-	60	-	-	-	60	-	-	-	60
50	50	65	80	50	65	80	80	50	65	80	80	50	65	80	80	50	65	80	80
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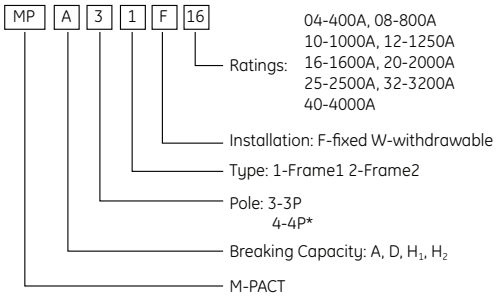
-	40	-	40	-	40	-	60	-	40	-	60	-	-	-	60	-	-	-	60
50	50	65	65	80	65	65	80	50	65	65	80	50	65	65	80	50	65	65	80
40	40	50	50	50	50	50	50	40	50	50	50	40	50	50	50	40	50	50	50
105	105	143	176	176	143	176	176	105	143	176	176	105	143	176	176	105	143	176	176
-	105	-	143	-	143	-	176	-	143	-	176	-	-	-	176	-	-	-	176
-	105	-	105	-	105	-	143	-	105	-	143	-	-	-	143	-	-	-	143
-	84	-	84	-	84	-	105	-	84	-	105	-	-	-	105	-	-	-	105
284	284	196	98	86	224	163	143	351	351	255	223	418	418	418	366	571	571	571	571
574	574	392	209	184	490	347	306	765	765	542	478	888	888	888	783	1224	1224	1224	1224

Catalog NO.Configuration



* Letter 'L' & 'R' only for type selection, not shown on nameplate.

Recommended Minimum Copper Size

In accordance with IEC 60947-2

Rating (A)	Copper / phase
400	2 x 50 x 5
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

Dimensions in mm

Frame Size	Rating (A)	Poles	Type	Height[1]	Width	Depth[2]
1	400 to 2500	3	Withdrawable	440	329	422
			Fixed	430	342	352
		4	Withdrawable	440	429	422
			Fixed	430	442	352
2	800 to 4000	3	Withdrawable	440	419	424
			Fixed	430	432	352
		4	Withdrawable	440	549	424
			Fixed	430	562	352

(1) Height is from mounting surface to highest part of the ACB.
(2) Depth is from the cubicle door to the back of terminals.
* 4P,Neutral on the left or right Please specified on sdection form,the defaule option is Neutral on night.

Weights (kg)

		A range		D range		H range	
Fixed pattern ACB	**Frame**	**3 Pole**	**4 Pole**	**3 Pole**	**4 Pole**	**3 Pole**	**4 Pole**
400 to 1600A	1	39	49	39	49	/	/
2000 to 2500A	1	43	54	43	54	/	/
800 to 3200A	2	53	68	53	68	53	68
4000A	2	53	68	53	68	53	68
Withdrawable ACB	**Frame**	**3 Pole**	**4 Pole**	**3 Pole**	**4 Pole**	**3 Pole**	**4 Pole**
400 to 1600A	1	68	79	68	79	/	/
2000 to 2500A	1	74	85	74	85	/	/
800 to 3200A	2	90	109	90	109	90	109
4000A	2	113	128	113	128	113	128

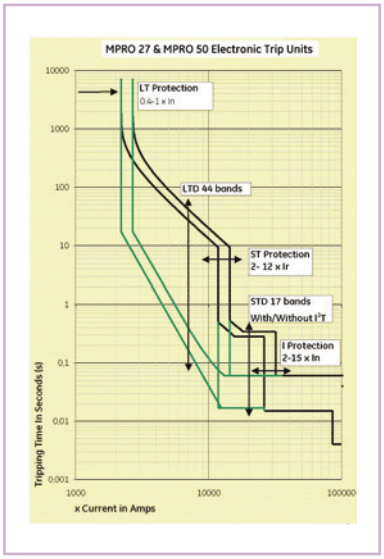
State of the Art Electronic Trip Units

- A line offering a new range of electronic trip units designed to extend and/or upgrade the functionality offered by the existing M-PACT Plus air circuit breaker.
- Two types are available. The simple and effective MPRO-27 and the MPRO-50 offering extended functionality .
- Each has a LCD screen with ammeter and a menu driven setting interface, allowing a simple and accurate setting of all parameters.
- This global line of electronic trip units uses the most recent technology to offer each user an unique combination of selectivity speed and functionality.

Plug'n Play

Electronic trip units are normally supplied factory fitted. However spares are available that can be simply plugged in to breakers installed in the field.

Each trip unit then needs to be adjusted to the required settings. If the installation is not powered up the installed battery pack or the seperately available test kit with Power Pack can be used as alternate power source.



MPRO-27 & MPRO-50

The basic MPRO-27 type has been designed to replace the existing MPRO-17 and MPRO-18 plus units offering an extended functionality and a standard ammeter.

The MPRO-50 type replaces the existing MPRO-30 and MPRO-40 designs covering an extended functionality with protection devices as fuse links, overload protection and reduced instantaneous (RELT). Each MPRO-50 comes with a simple to connect 4 wire modbus communciation option.

Main Adjustment Options

- **LT-LTD protection**
  Each device has an overload setting range of 0.4 to a times In and offer a choice of 22 time bands designed for use with circuit breakers.
  A second set of 22 time bands shaped to match the time current curves of fuses is available on the MPRO-50 type.
- **ST-STD protection**
  A timed delayed short circuit protection is installed with a current setting of 2 to 12 times the set LT current value. The short circuit protection time can be set, at one of 17 bands ranging from 90 milliseconds to 1 second.
  Optionaly this device can be set to one of three I^2t curves.
- **I-protection**
  A switchable and selective instantaneous protection with a setting range of 2 to 15 times the breaker rating that is programmed to wait one half cycle until the downstream device has reacted.
- **Other protection features**
  A host of other protection devices is availble including Ground Fault sum and Ground Fault source return (allowing UEF, SEF & REF) and a reduced instantaneous device. The reduced instanataneous device allows the user to conditionally programme the breaker to trip faster and at lower short circuit settings than it would on the standard instantaneuos device.
  This RELT device allows the user to reduce the short circuit current level and its time span, thus reducing the amount of electrical energy in the direct vicinity of the breaker.

Trip Unit	MPRO-27	MPRO-50
Setting Interface		
LCD screen allowing access to 4 distinct menu's	X	X
Touch pad adjustments	X	X
Multilingual	X	X
Adjustable manual or automatic RESET option	X	X
Long Time or Overload Current Protection		
13 current settings Ir 1, 0.95, 0.9. 0,85, 0.8, 0.75, 0.7, 0.65, 0.6, 0.55, 0.5, 0.45 & 0.4 x breaker rating In	X	X
22 thermal protection (C type) time bands available ranging from class 0.5 to 40 (bands at 7.2 x Ir)	X	X
22 I^2t protection (F type {fuse}) time bands available	-	X
Neutral protection 0-50%-63%-100%	X	X
Possibility to switch OFF	-	X
Cooling function and thermal memory	X	X
Short Time Short-Circuit Current Protection		
Setting range from 1.5 to 12 x Ir (LT setting)	X	X
Steps of 0.5 (a total of 22 settings)	X	X
Possibility to switch OFF	-	X
17 time delay settings (STDB) ranging from 30 to 940 milliseconds delay setting result in a 90 to 1000 milliseconds	X	X
Clearance times to IEC 40979-1 and IEC 60364		
3 I^2t Protection time bands available		
Instantaneous Short-Circuit Current		
• Standard		
Ii setting range from 2 to 15 x breaker rating In	X	X
Steps of 0.5 (a total of 28 settings)	X	X
Possibility to switch OFF	X	X
Selective execution	X	X
Fixed instantaneous or HSIOC protection	X	X
• Reduced		
Ii setting range from 1.5 to 15 x Ie (primary setting)	-	X
Steps of 0.5 (a total of 29 settings)	-	X
Possibility to switch OFF	-	X
Remote and local ON and OFF with position indication signal	-	X
Ground or Earth Fault Protection		
Setting range from 0.1 to 1 x In (breaker rating) (1)	•(1)	•(1)
Steps of 0.01 (a total of 92 settings)	•	•
Possibility to switch OFF	•	•
14 time delay settings (GFDB) ranging from 50 to 840 milliseconds delay setting resulting in a 110 to 900 milliseconds	•	•
Clearance times to IEC 40979-1 and IEC 60364	•	•
3 I^2t protection time bands available	•	•
1 I^4t protection time bands available	•	•
Residual principle (UEF application possible)	•	•
Source ground return principle	-	•
UEF, REF and SEF applications possible	-	•
Combinations of UEF, REF and SEF applications possible	-	•
Other Functions		
Current measurement (L1, L2, L3, N)	X	X
Trip target (trip reason indication)	X	X
Trip info (magnitude / phase)	X	X
Trip counter	X	X
Event logger (trip events)	X	X
General inputs (4 availble)	-	X
General relay outputs (4 available)	-	X
Relay based on current level (load shedding)	-	X
Good & bad health indicator	-	X
Watchdog	-	X
Communication 2 way	-	X
Modbus	-	X
24V DC auxiliary power supply	X	X
Test kit with power support function	•	•

(1) A 24V auxiliary power supply is required.

Key
X = Present
• = Optional
- = Not possible

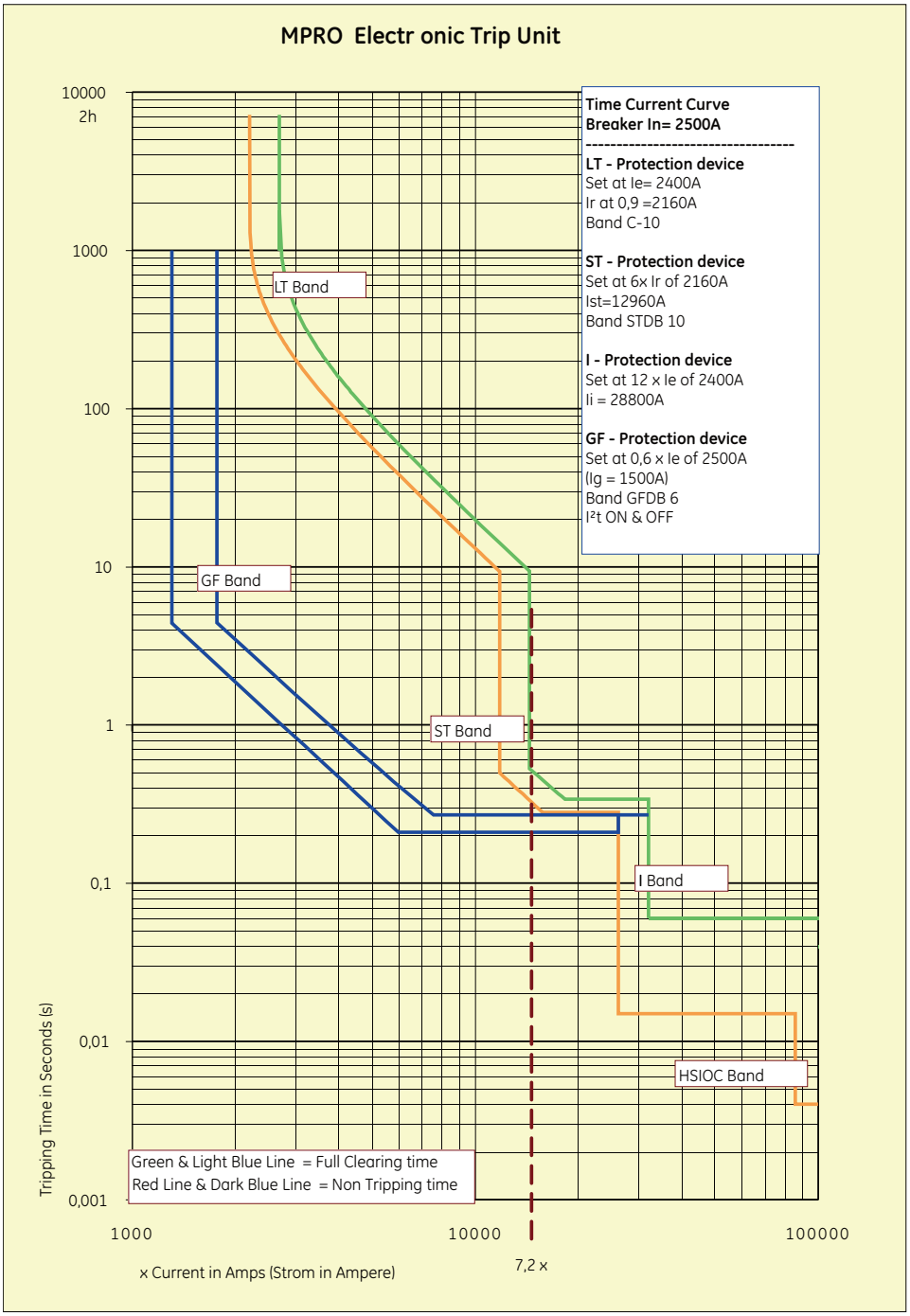
Time Current Curves

Example of Full Time Current Curve
Time Current Curve

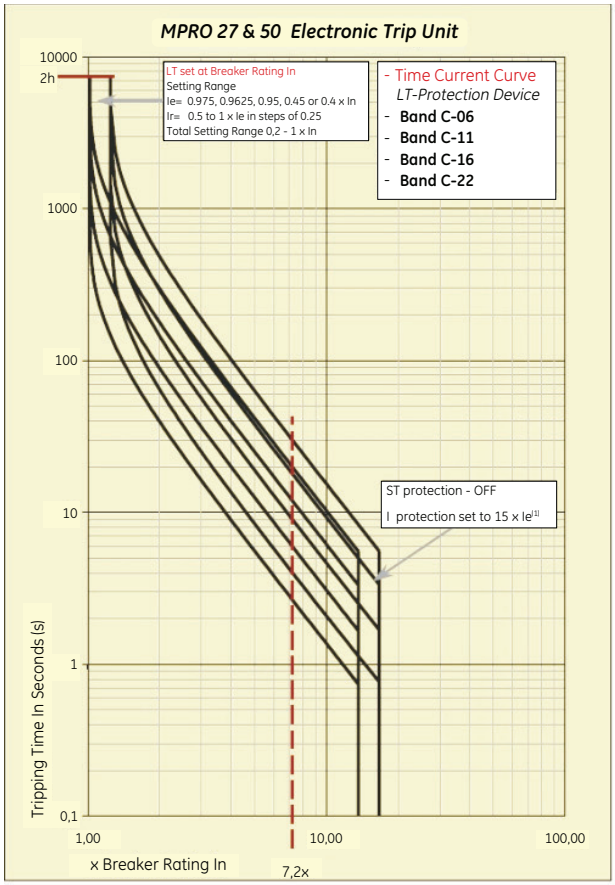
The MPRO Electronic trip unit has many sophisticated setting features and an extremely broad setting range. On request we can provide complete

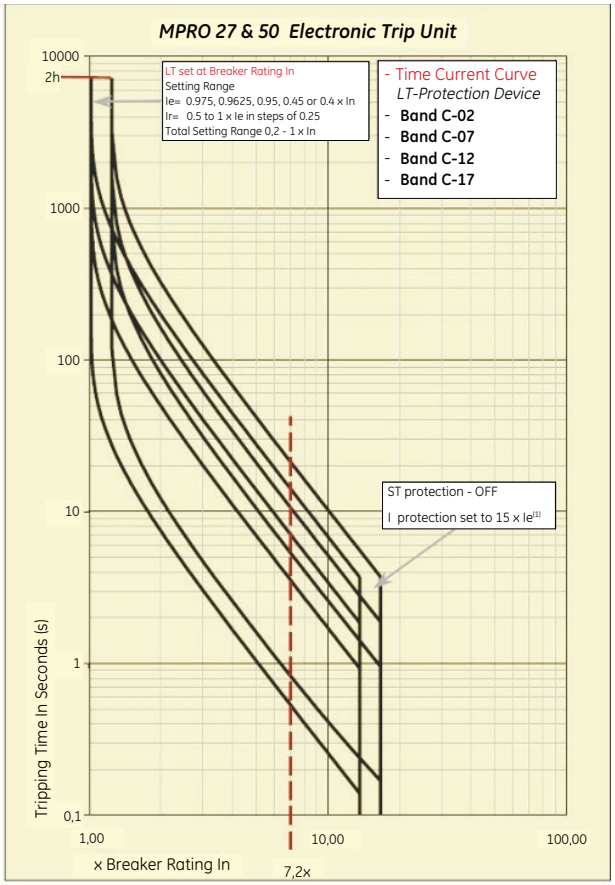
Time Current Curves covering all installed protection devices.

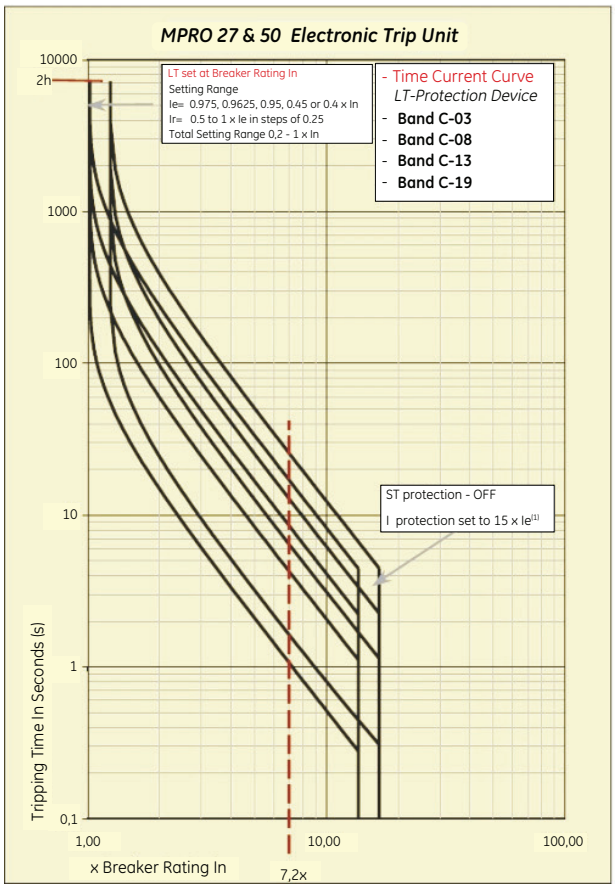
The curves can be produced for any current setting within the range of the installed protection devices, for one or for a combination of two breakers.
Please contact your local GE Sales Office for more information.

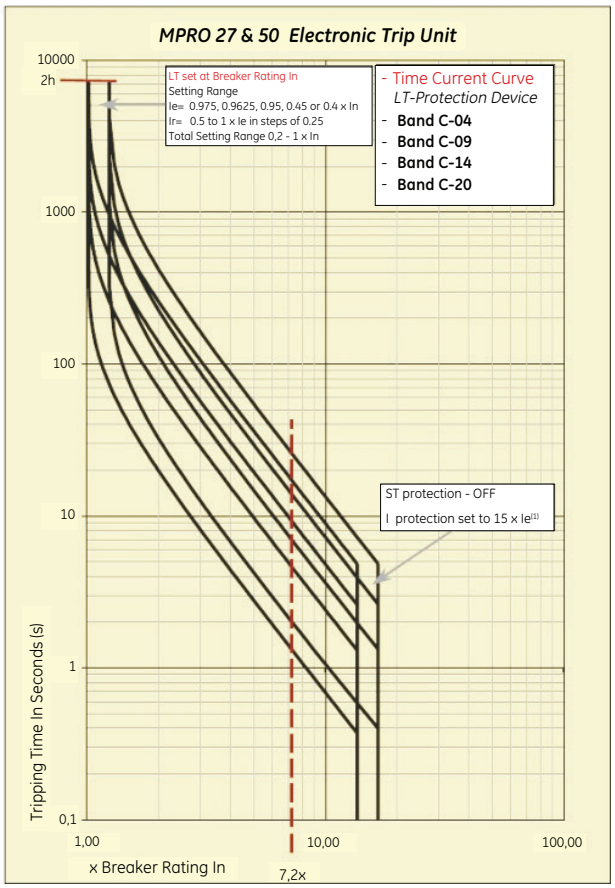


Time Current Curves (cold state)
LT Protection Device

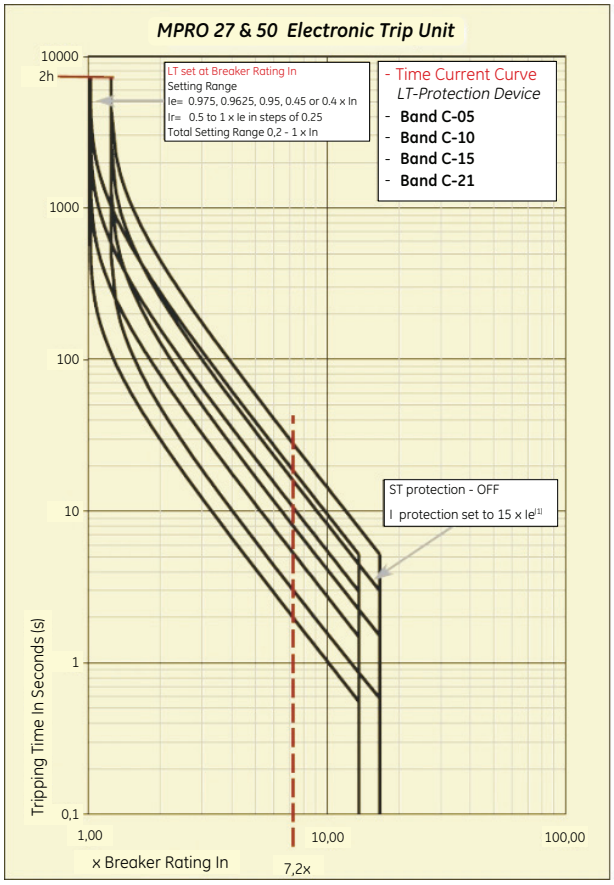


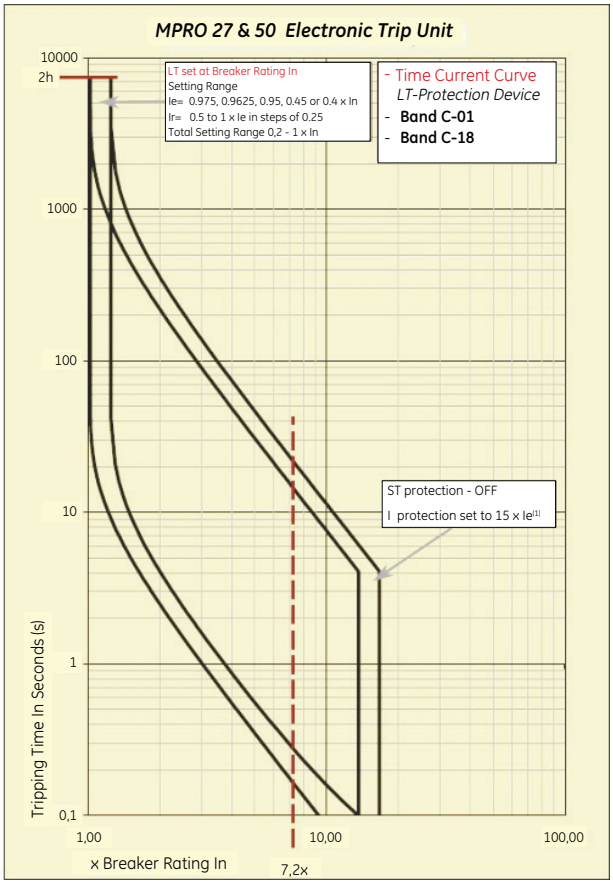


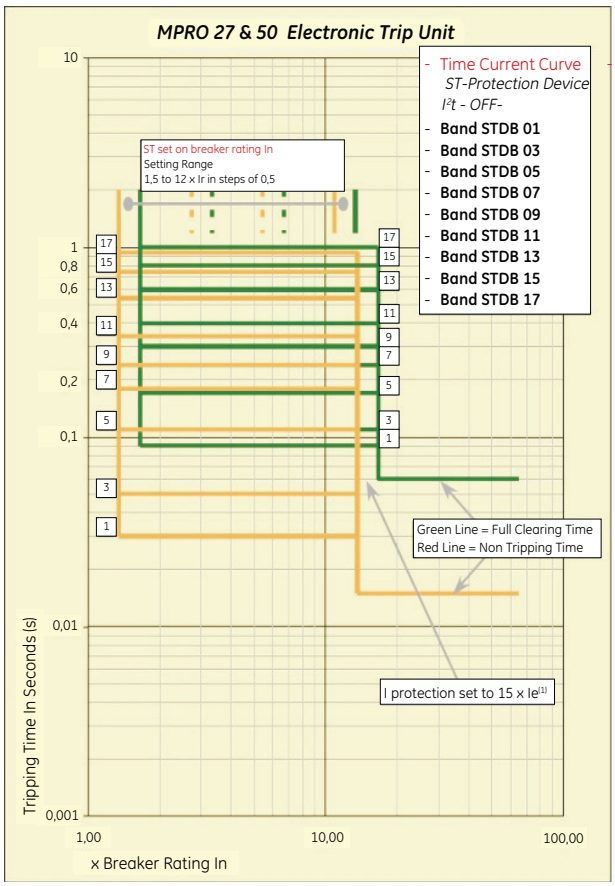


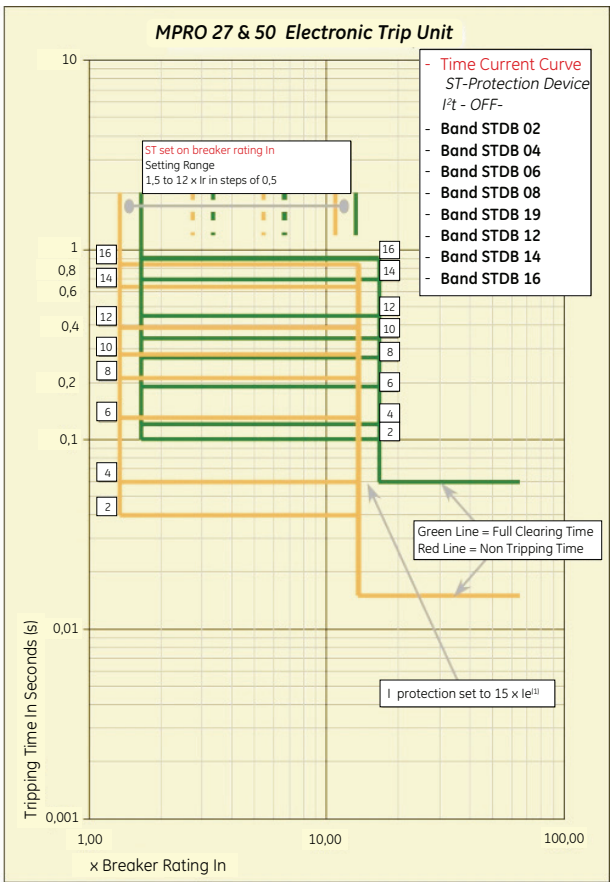


Time Current Curves (cold state)
LT & STDB Protection Device

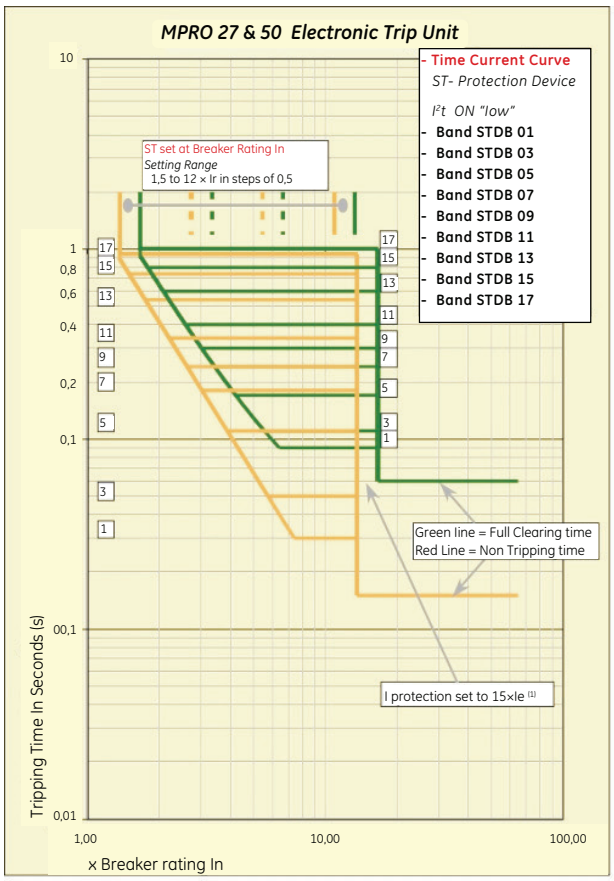


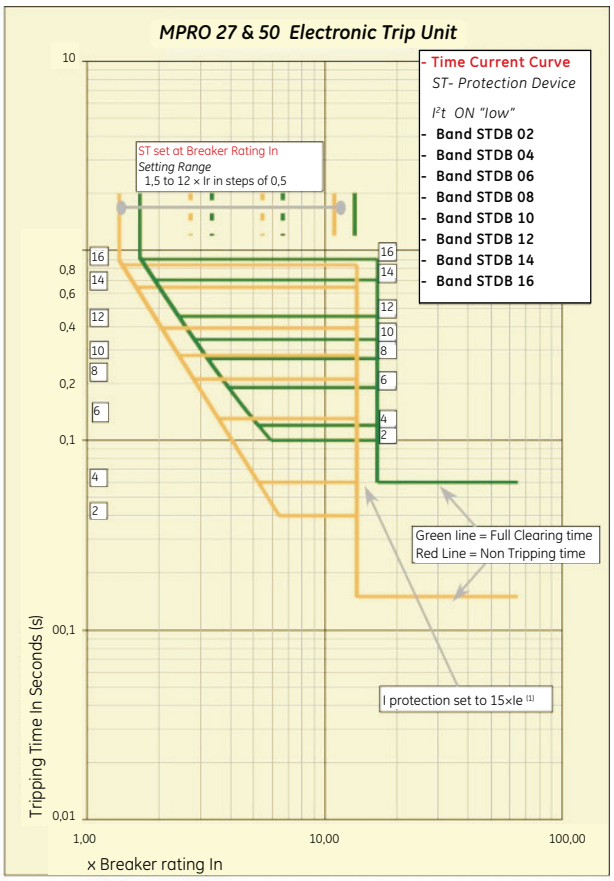


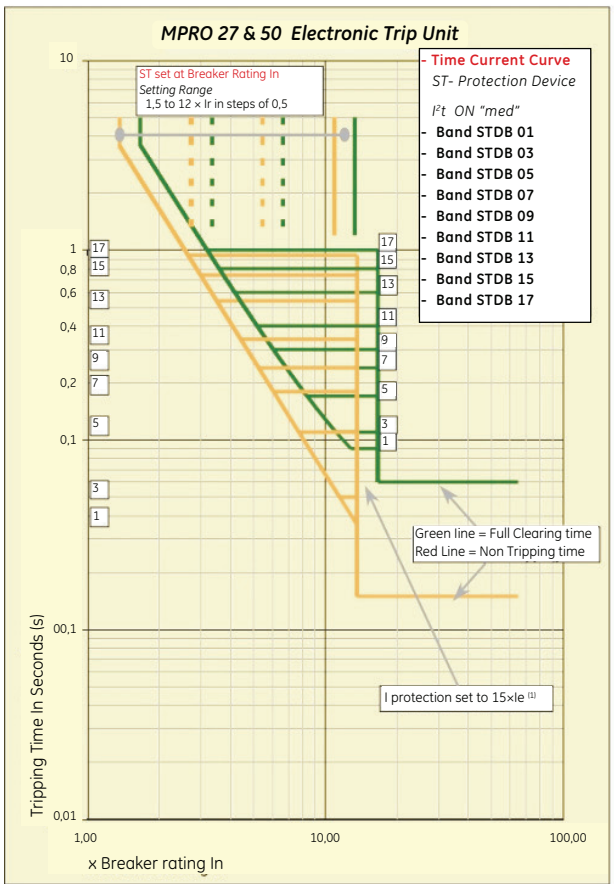


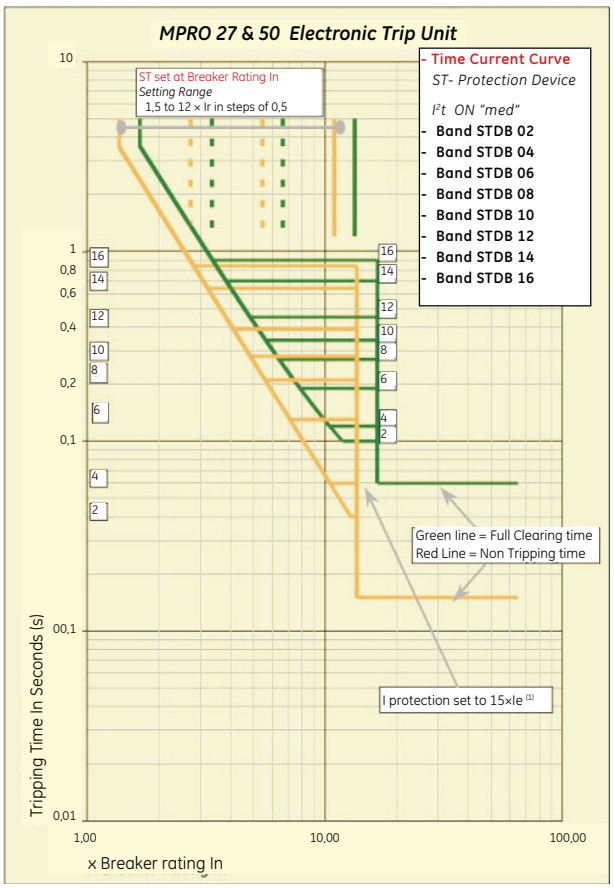


Time Current Curves (cold state)
ST Protection Device

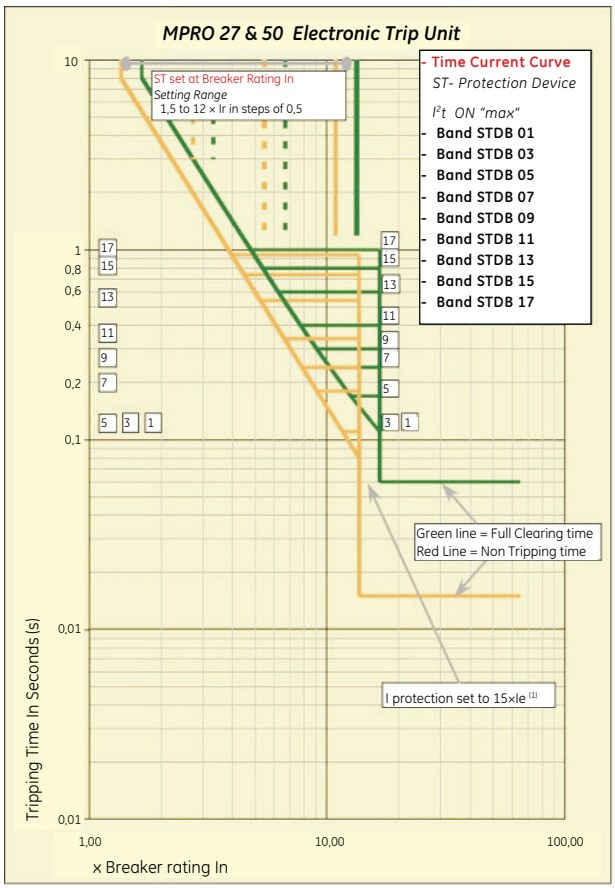


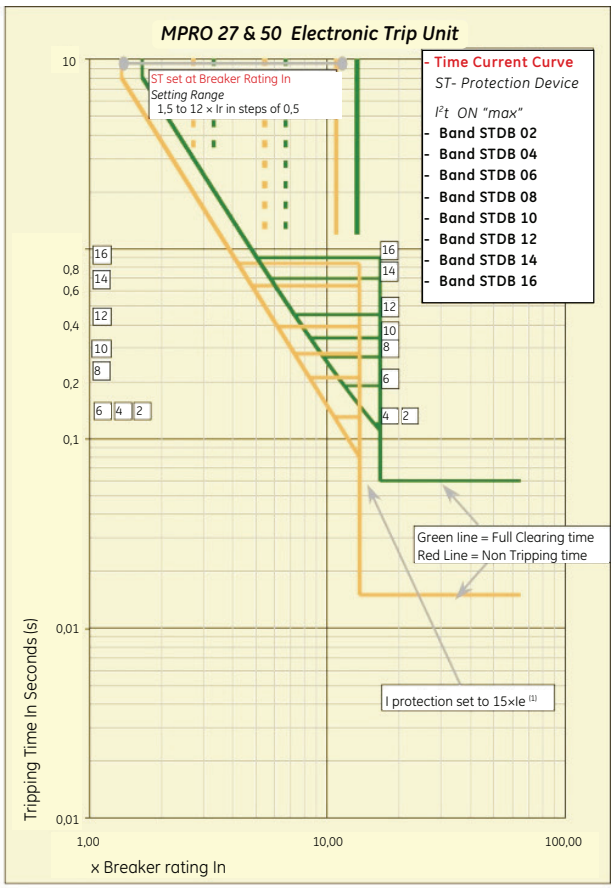


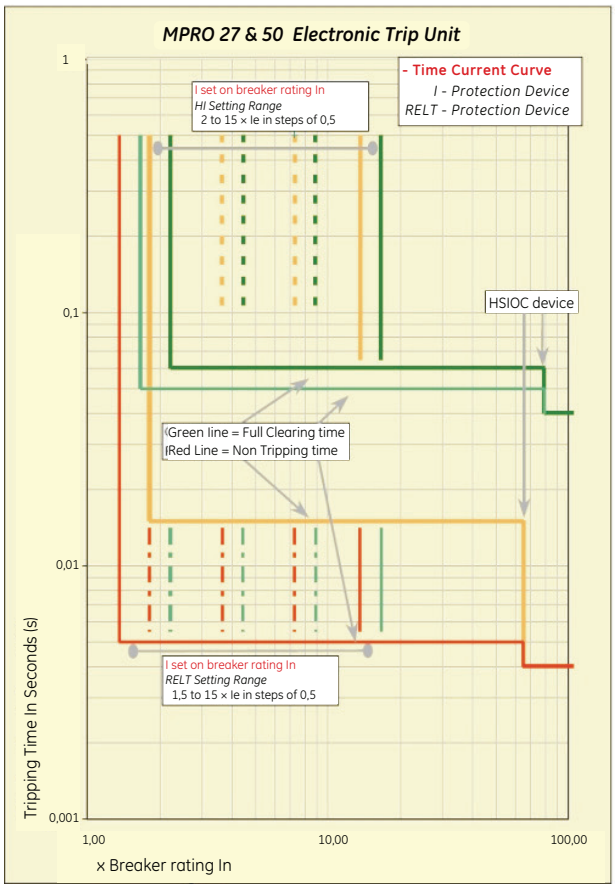


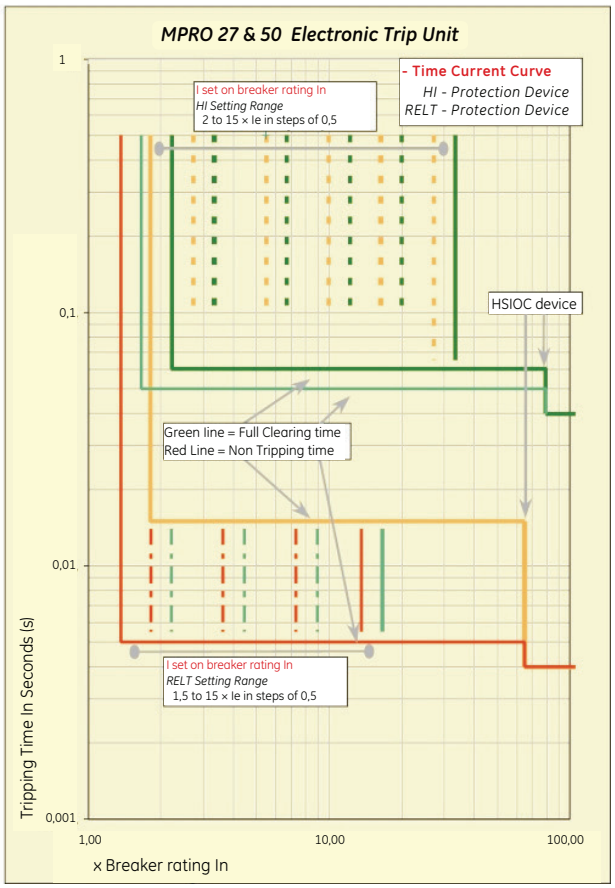


Time Current Curves (cold state)
ST, I and Hi Protection Device

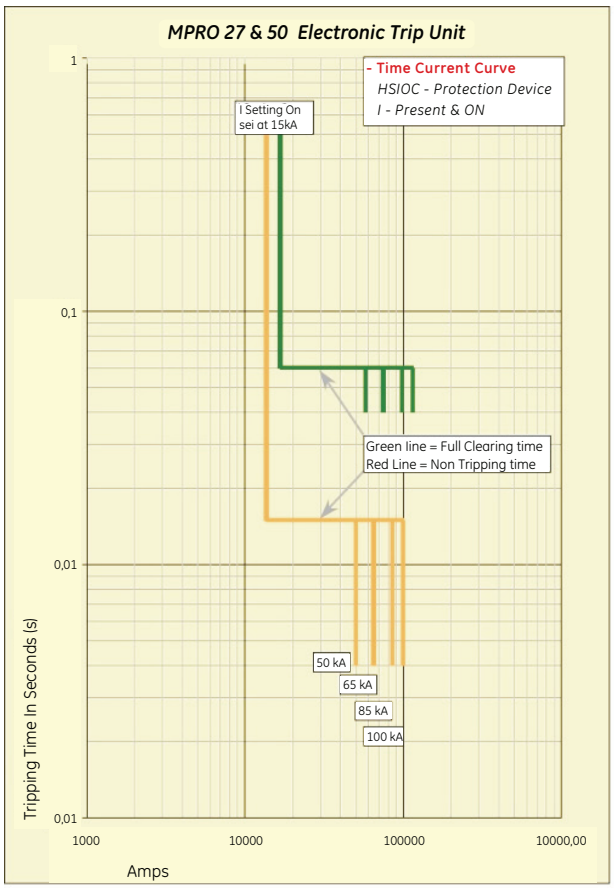


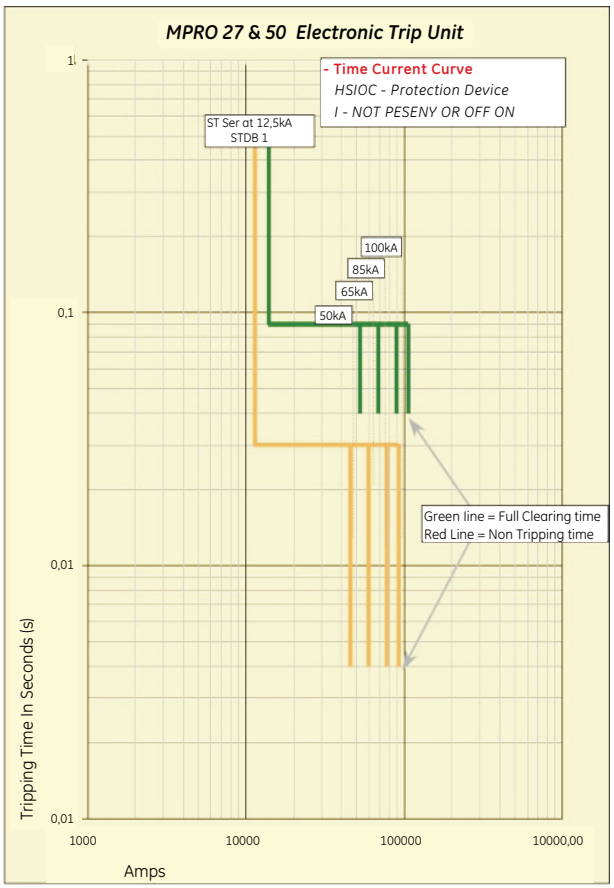


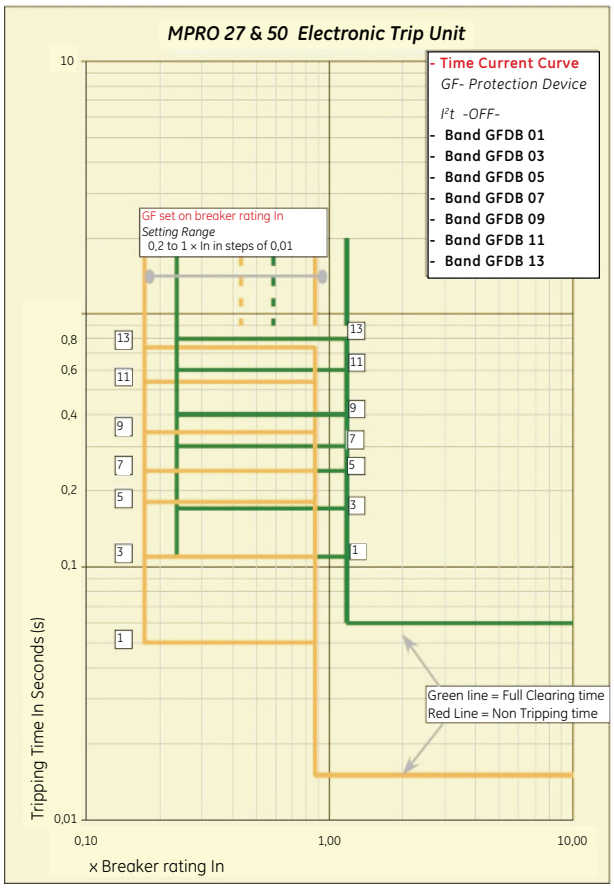


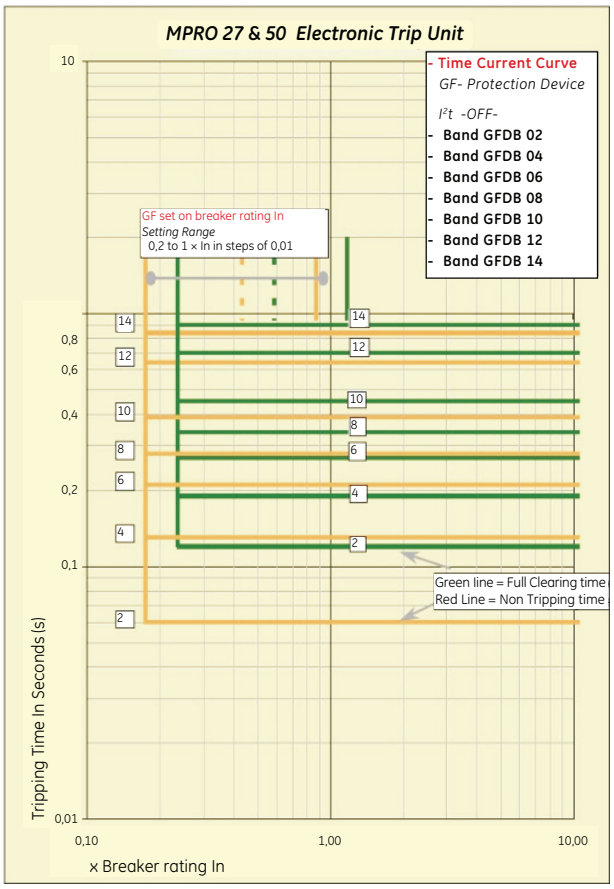


Time Current Curves (cold state)
HSIOC & GF Protection Device

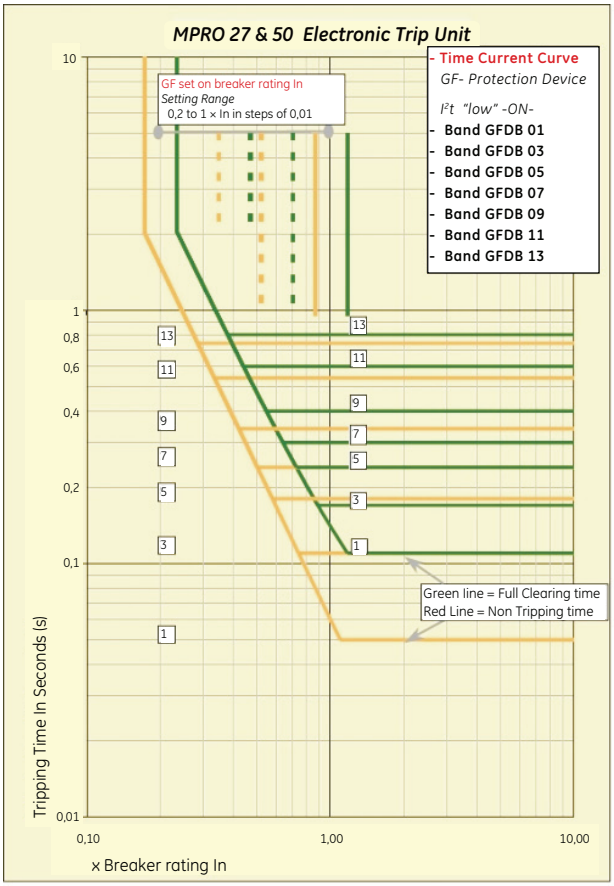


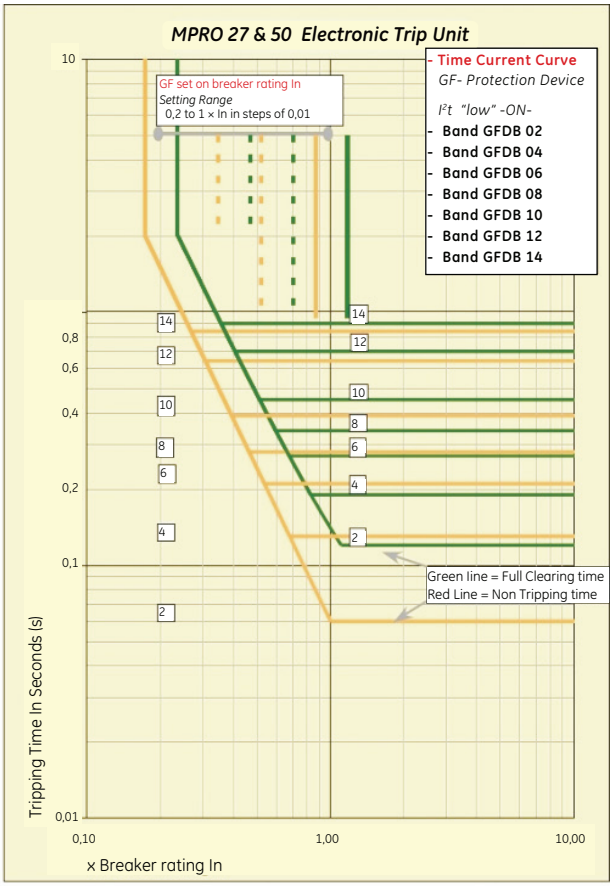


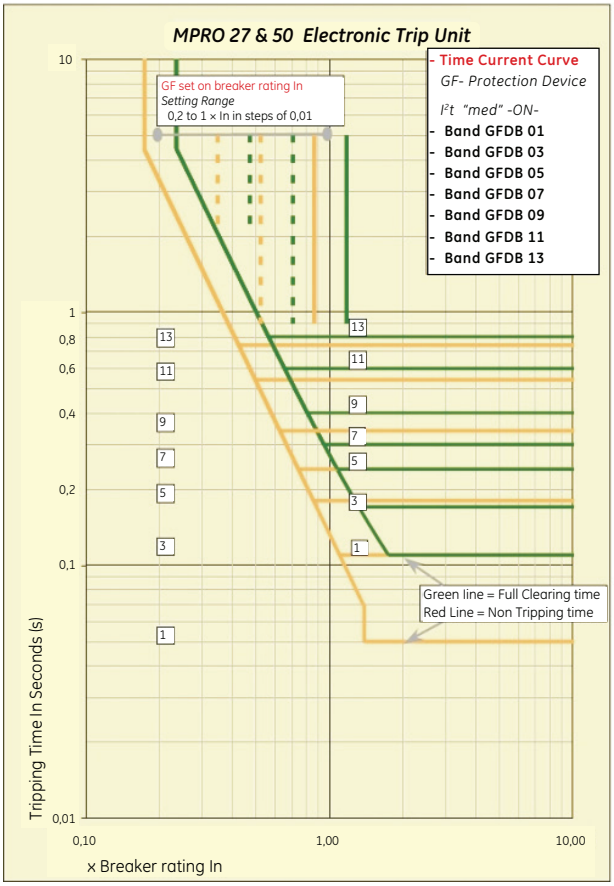


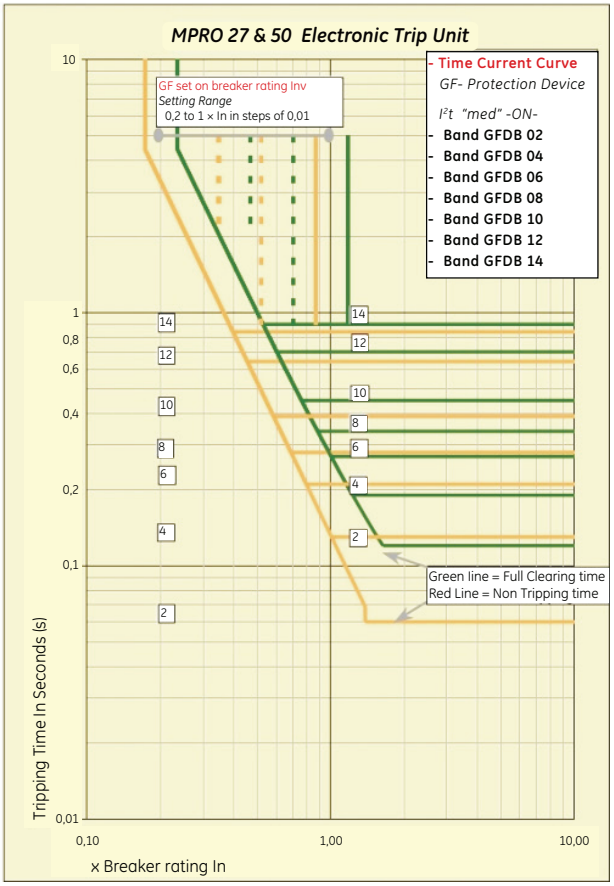


Time Current Curves (cold state)
GF Protection Device

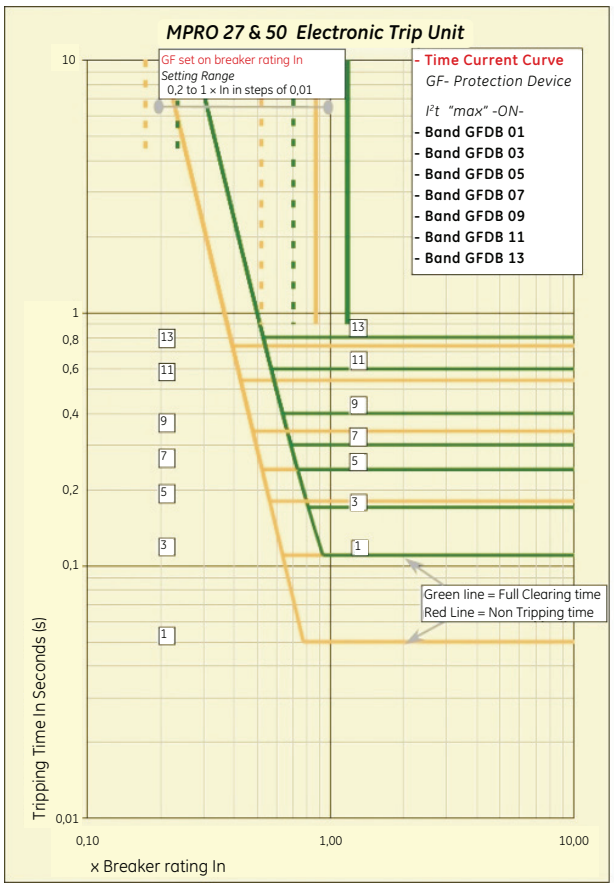


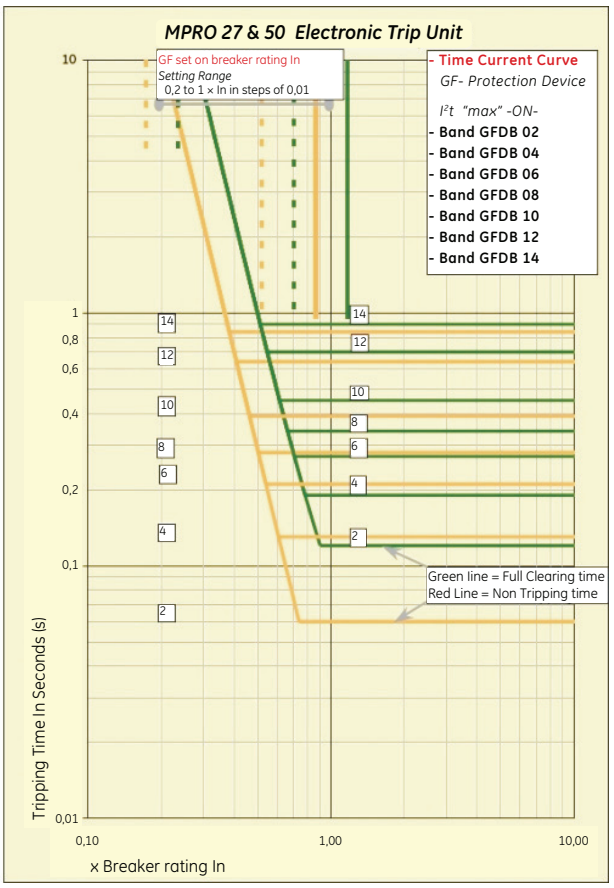






Time Current Curves (cold state)
GF Protection Device

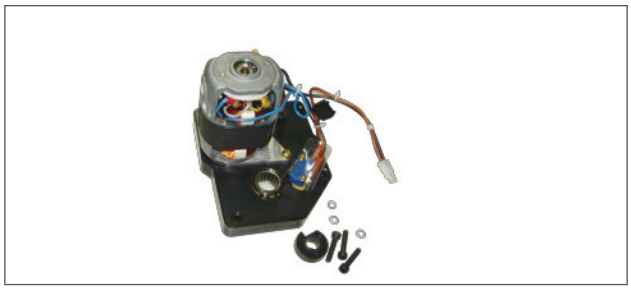




M-PACT Accessories

A wide range of optional accessories have been developed that are compatible with all M-PACT air circuit breakers, regardless of nominal rating or frame size. Each one incorporates 'easy-fit' design features for quick installation, either in the factory or by the user on site.

Motorised spring charging unit



The unique motor/gearbox unit is specially designed to operate with the full range of M-PACT breakers.
It is easily fitted with just two bolts. In the event of circuit breaker closure, this unit will automatically recharge the spring in readiness for instant reclosure should the need arise.
High speed recharging ensures that the springs are fully charged within approximately three seconds following a release.
As an optional feature, a "springs charged" contact is available for the motor unit.

Circuit breaker closing coil

The closing coil is an easy-to-fit, clip-on unit, with simple plug-in connectors. This permits either local or remote release of the spring charged closing mechanism by electrical operation.
An additional anti-pumping safety feature also ensures that the electrical closing signal must be released before further closure is attempted, and a cut-off is instigat-ed should a closing signal be maintained.
Because each coil operates within a wide voltage range, the number of individually rated coils required is drastically reduced.

Shunt trip

Energisation, locally or remote, will instantaneously activate the circuit breaker mechanism, ensuring rapid disconnection of the main contacts.
In addition, a series connected auxiliary switch ensures automatic isolation whenever the circuit breaker is open.
Shunt trip releases also have a wide operational voltage range, and they include the same easy-fit, clip-on/plug-in connectors as the closing coil above.

Undervoltage release

Instantaneously releases the circuit breaker trip mechanism should the supply voltage dip below the pre-set value.
Simple to install, these devices have the same easy-fit features as previously described.
Note: This is a 'no-volt/ no-close device. The circuit breaker cannot be closed (manually or electrically) unless the undervoltage release coil is energised.
Time delay undervoltage release Similar to the above, but this electronic device prevents nuisance tripping of the circuit breaker if circuit interruption is not desirable when supply voltage drop is only transient. Fixed time delay 3 sec ±1sec.

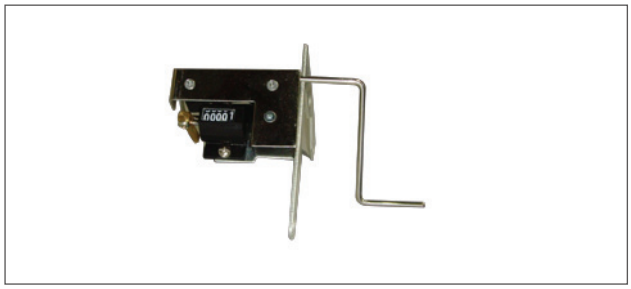
Auxiliary trip combination

The M-PACT circuit breaker can be equipped with the following auxiliary trips or releases 1 x Shunt trip + 1 x Closing coil + 1 x Undervoltage release or 1 time delay Undervoltage release

Auxiliary switches

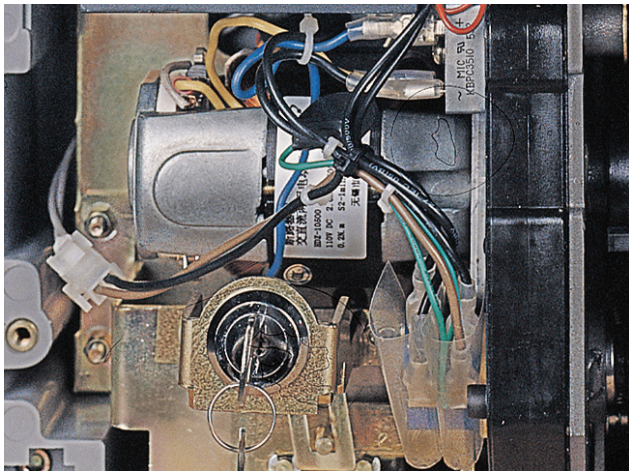
The M-PACT circuit breaker is equipped with 5 NO and 3 NC auxiliary switches as standard. Maximum number of contacts is 8, for alternative configurations please contact for availability.

Mechanical operation counter



Easily fitted, this useful accessory may be specified for use with either manual or motor charged M-PACT circuit breakers.
It is clearly visible through the front panel, and the counter provides an accurate record of the cumulative number of complete breaker closing operations.

Key interlock facility



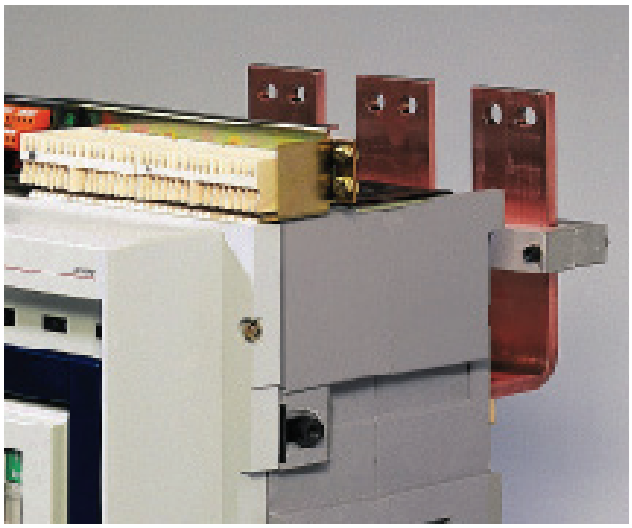
Ready-to-fit interlocking device: Ronis, for installation between separate circuit breakers, available in kit form.
This valuable safeguard ensures that a circuit breaker cannot be closed unless the dedicated key has been inserted and secured within the lock.

Lock and key types

Ronis: Type 1104B lock with standard key, 1/4" turn rotation to trap the key, compulsory spindle size.

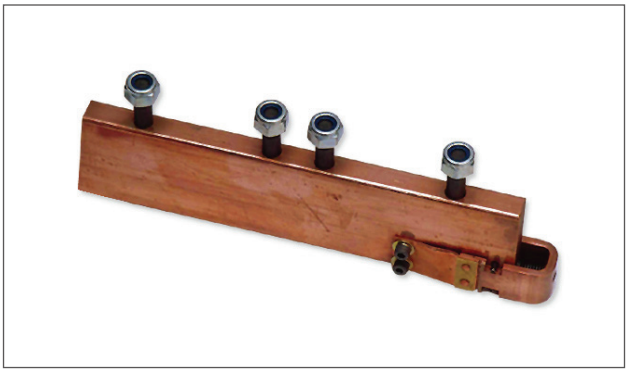
Cassette main terminal adaptors

Combinations of rear and front access connections possible for entire range. Tested and approved from 50 to 80kA.



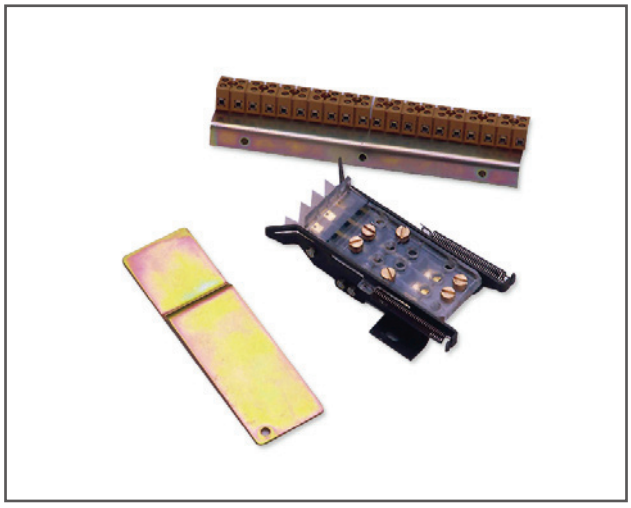
To simplify main busbar or cable termination, M-Pact provides a full range for rear and/or front access connection.
Bolt-on adaptor kits can be fitted easily to suit either horizontal or vertical connections.

Cable/busbar earthing device



All 'M-PACT' circuit breakers can be fitted with an earthing device. It has a short circuit fault capacity equal to the Icw rating of the breaker. This permits either the feeder cables or the busbar to be safety held at earthed potential and locked during system maintenance operations.

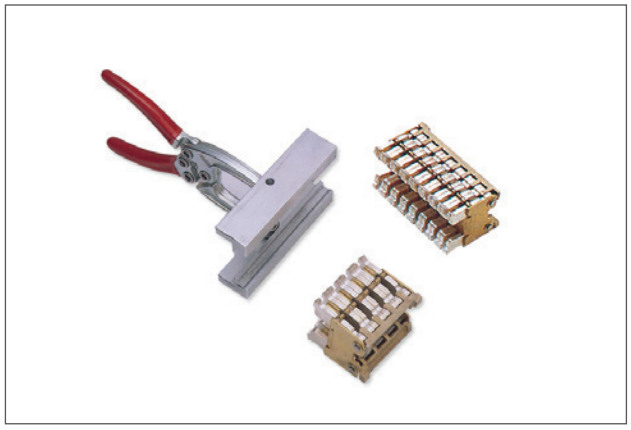
Carriage position switch



Available as an optional device for mounting within the base of the cassette, this switch provides six single pole changeover contacts for local or remote electrical indication of the circuit breaker status: **Connected, Test and Disconnected.**
The **Disconnected** position is indicated only when minimum isolating distances between contacts on both the main and auxiliary circuits have been achieved.
This option is in addition to the mechanical indicators which are fitted as standard.
When installed, the carriage switch is IP2X protected and includes wiring to a terminal block located on the left-hand side of the cassette.

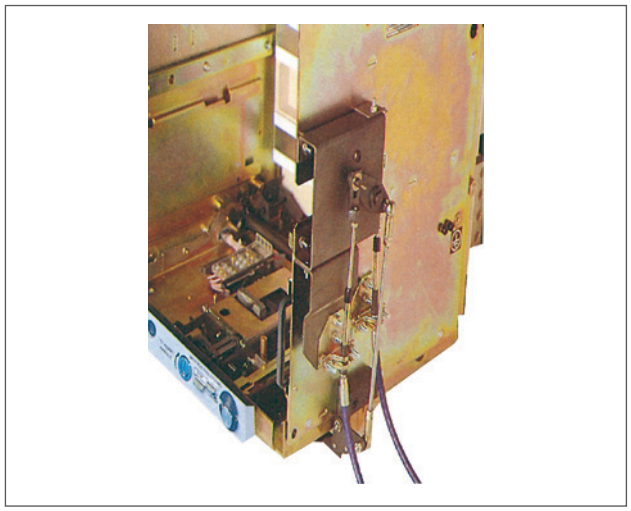
Note: The carriage position switch is an option only suitable for withdrawable circuit breakers.

Cluster contacts



These are the main isolating contacts which are fitted to the rear terminals on the moving portion of the withdrawable unit.
As part of standard inspection and maintenance procedures, cluster contacts have been designed to be easily and quickly removed and replaced using universal cluster pliers.

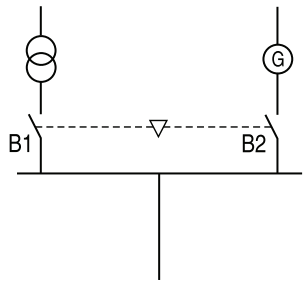
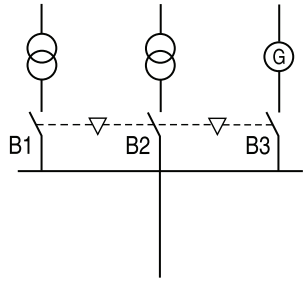
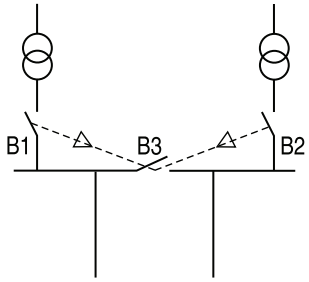
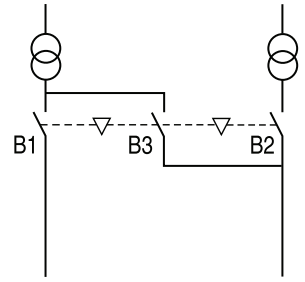
2/3 way cable mechanical interlocks



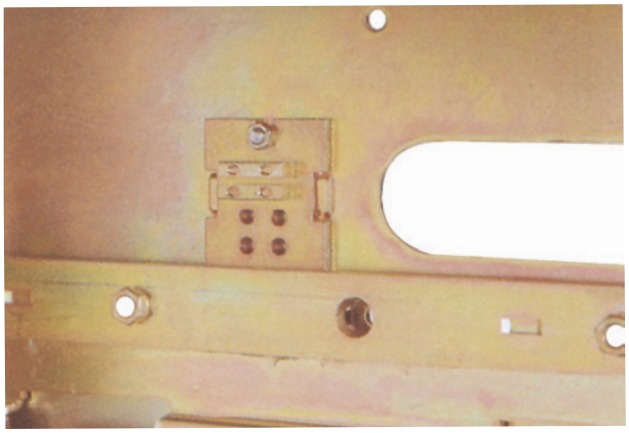
Available for fixed and withdrawable circuit breakers. These units enable the direct interlocking of M-PACT circuit breakers, either mounted side-by- side or stacked. The interlocking mechanisms are connected by a specially designed cable in '1 from 3' OR '2 from 3' configuration, and any mix of current ratings / pole configurations can be accommodated.
Standard cable lengths available: 1.6, 2.0, 3.0 metres. (Please contact our technical customer service department if longer length is required.)

Interlocks

Mechanical interlocks can be fitted to the following electrical systems and can link 2 or 3 circuit breakers of any rating or number of poles, Fixed or Withdrawable.

Typical circuit	Interlock configuration	Possible combinations
	Type A Interlocking between 2 circuit breakers B1 normal power supply B2 generator (emergency) supply	B1 B2 0 0 I 0 0 I Circuit breaker B1 can only close if B2 is open Circuit breaker B2 can only close if B1 is open
	Type B Interlocking between 3 circuit breakers 3 power supplies (generator or transformers) feeding the same busbar but parallel operation is prevented. Available upon request.	B1 B2 B3 0 0 0 I 0 0 0 I 0 0 0 I Only 1 from 3 breakers can be closed
	Type C Interlocking between 3 circuit breakers 2 bus sections can be powered by a single transformer (bus coupler closed) or by both transformers (bus coupler open). Available upon request.	B1 B2 B3 0 0 0 I 0 0 0 I 0 0 0 I I 0 I 0 I I I I 0 Any 2 from 3 circuit breakers can be closed Any 1 from 3 circuit breakers can be closed
	Type D Interlocking between 3 circuit breakers 2 normal power supply not set in parallel. 1 power supply may assist the priority circuit Available upon request.	B1 B2 B3 0 0 0 I 0 0 0 I 0 I I 0 0 0 I Circuit breakers B1 and/or B2 can be closed only if B3 is open Circuit breaker B3 can only be closed if B1 & B2 are both open

Circuit breaker insertion interlock



By incorporating this optional security interlock device into a system, it prevents the inadvertent insertion of an incorrectly rated withdrawable circuit breaker into a cassette.

Cassette interlock

Available for withdrawable circuit breakers only, this sophisticated interlock system secures the circuit breaker in the disconnected position by means of a Ronis key.
When the key is removed, the safety shutters are automatically locked in position, thus preventing access to the contacts and also ensuring that the racking mechanism is not operable. For lock and key details refer to key interlock facility section (p. A.21)

Sealed door panel escutcheon

An optional IP54 complete front door panel is available should a higher degree of protection be necessary.

Circuit breaker handling truck

Specifically designed for use with the M-PACT range, this dedicated handling truck is a useful accessory when faced with the task of inserting or removing the circuit breaker from its panel, or when transporting the unit should it be outside its cassette. Installers will also find it particularly valuable for top-tier mounted circuit breakers.

Plug-in Portable Test Unit (PTU)

Specially designed for reliable testing of the MCR and HSISC protection systems on each phase, by means of tertiary injection. The test unit is also used to prove both overcurrent and earth fault pick-up levels.Can also be employed to test for tripping in order to verify efficient microprocessor operation. The test unit incorporates a set of rechargeable batteries and includes a charger unit as standard.

Auxiliary Power Unit (APU)

Available to be fitted within the circuit breaker cubicle, an APU ensures that M-PRO receives independent and continuous
power at all times. The APU accepts any input supply voltage within 380VAC, 110V, 220V AC/DC. Maximum input current is 0.5 A. 1m length cable (twisted pair) should be used to connect auxiliary supply and MPRO protection relay.

Accessories Performance Data				
Device	Operating Voltage (V) AC	DC	Operating range	Rating (Amps resistive)
Auxiliary & carriage switch	250		-	10
		125	-	5
		250	-	0.25
Motor operator	220-250	220-250		AC-50VA DC-50W
	110-130	110-130		
	380-440	48, 60	0.85 to 1.1 times	
		24-30	rated voltage	
Closing coil	220-250	220-250		AC-300VA DC-250W
	110-130	110-130		
	380-440	48	0.85 to 1.1 times	
		24-30	rated voltage	
Shunt trip	220-250	220-250		AC-300VA DC-250W
	110-130	110-130		
	380-440	48	0.70 to 1.1 times	
		24-30	rated voltage	
Instantanious Undervoltage release	380-440	110-130	-	Inrush power consumption 300VA Holding power consumption 20VA
	220-250	30-48	-	
	110-130		-	
Auxiliary power unit	110, 220, 380	110, 220	-	-

1. Customer Name 2. Project 3. Quanitity

Specify on the Order

Code MP ☐☐☐☐☐☐-☐☐☐☐☐☐☐ **Voltage (Ue)** ☐ 415 ☐ 690

1. Device	☐ Type A	☐ Type D	☐ Type H_1	☐ Type H_2	
2. Rating	☐ 400A	☐ 800A	☐ 1250A	☐ 2000A	☐ 3200A
	☐ 630A	☐ 1000A	☐ 1600A	☐ 2500A	☐ 4000A
3. Number of poles	☐ 3-pole	☐ 4-pole neutral left	☐ 4-pole neutral right		
4. System	☐ 3 phase 3 wire	☐ 3 phase 4 wire			
5. Frequency	☐ 50Hz	☐ 60Hz			
6.Type		Top & Bottom connection			
	☐ Fixed	☐ Front or	☐ Rear Horizontal		
	☐ Withdrawable	☐ Front or	☐ Rear Horizontal	☐ Rear Vertical	
	☐ Moving portion only				
7. Protection	☐ Non automatic	☐ MPRO 27	☐ MPRO 50L	☐ MPRO 50H	
8. Earth Fault options	☐ Unrestricted (UEF)	☐ Restricted (REF)	☐ Stand-by (SEF)		
9. M PRO options	☐ Portable test unit		☐ Operations counter		
	☐ Mechanical Trip alarm Switch (1n/o)		☐ Auxiliary power unit		

12. Control voltage	MOP	CC	ST	UV	UVTD
				Alternative	
24/30V DC	☐	☐	☐	☐	
48V DC	☐	☐	☐	☐	☐
110/130V DC	☐	☐	☐	☐	☐
110/130V AC	☐	☐	☐	☐	☐
220/250V DC	☐	☐	☐		
220/250V AC	☐	☐	☐	☐	☐
380/440V AC			☐	☐	☐
With motor changing singinal	☐ with				

13. Carriage switch	☐ Factory fitted	☐ Loose kit			
14. Interlocks	Door interlock	☐ Left Hand Door Interlock	☐ Right Hand Door Interlock		
	☐ Ronis Cassette Key interlock				
	☐ Profalux Cassette Key interlock				
	☐ Roins key lock	☐ A	☐ B	☐ C	☐ D
	☐ Circuit breaker mis-insertion interlock				
Cable Interlock	☐ Type A 2 way	☐ Type B 1 from 3 way			
	☐ Type C 2 from 3 way	☐ Type D 1 from 3 way			
	Cable Length required (in centimeters)				
	☐ 160 ☐ 200 ☐ 300				
15. Miscellaneous	☐ Mechanical operations counter		☐ ACB lifting truck		
	☐ IP54 door panel		☐ Titan truck adaptor kit		

16. Special requirements (PLEASE SPECIFY ANY IMPORTANT INSTRUCTIONS)

Note: only Fr 1 type D & Fr 2 type H2 offer Ue=690Vac, others are Ue=415Vac.

M-PACT Air Circuit Breaker - TYPE A - 50kA

Basic circuit breaker manually operated, 5 NO and 3 NC auxiliary switches.
Withdrawable pattern - basic circuit breaker and cassette with flat copper terminals rear connected.
Fixed pattern - basic circuit breaker with rear terminals horizontal.

Withdrawable and Fixed Pattern

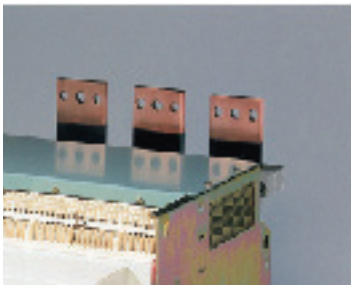
Frame size	Rating (A)	Poles	Withdrawable Cat. no.	Fixed Pattern Cat. no.
1	400	3	MPA31W04	MPA31F04
		4	MPA41W04	MPA41F04
1	800	3	MPA31W08	MPA31F08
		4	MPA41W08	MPA41F08
1	1000	3	MPA31W10	MPA31F10
		4	MPA41W10	MPA41F10
1	1250	3	MPA31W12	MPA31F12
		4	MPA41W12	MPA41F12
1	1600	3	MPA31W16	MPA31F16
		4	MPA41W16	MPA41F16
1	2000	3	MPA31W20	MPA31F20
		4	MPA41W20	MPA41F20
1	2500	3	MPA31W25	MPA31F25
		4	MPA41W25	MPA41F25
2	3200	3	MPA32W32	MPA32F32
		4	MPA42W32	MPA42F32
2	4000	3	MPA32W40	MPA32F40
		4	MPA42W40	MPA42F40

Installation: Units rated < 1600A have reduced copper section.
Refer to engineered drawings in section C.

Rear 'T' Connections (for cassette only)

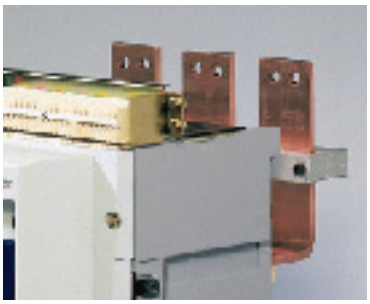
Frame size	Rating (A)	Poles	Pequired Quantity	Cat. no.	Cat. no.
1	400 to 1600	3	6	RT1HOR	Horizontal
		4	8	RT1HOR	Horizontal
1	400 to 1600	3	6	RT1VER	Vertical
		4	8	RT1VER	Vertical
1	2000 & 2500	3	6	RT1UNI	Universal
		4	8	RT1UNI	Universal
2	3200	3	6	RT2UNI	Universal
		4	8	RT2UNI	Universal
2	4000	3	Standard	N/A	Vertical
		4	Standard	N/A	Vertical

Front Access Connections



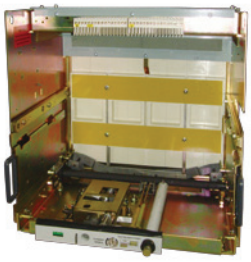
Frame size	Rating (A)	Poles	Withdrawable TOP connections Cat. no.	Withdrawable BOTTOM connections Cat. no.
1	400 to 1600	3	FA31WA16T	FA31WA16B
		4	FA41WA16T	FA41WA16B
1	2000 to 2500	3	FA31WA25T	FA31WA25B
		4	FA41WA25T	FA41WA25B
2	3200	3	FA32WA32T	FA32WA32B
		4	FA42WA32T	FA42WA32B
2	4000	3	FA32WA40T	FA32WA40B
		4	FA42WA40T	FA42WA40B

Front Access Connections



Frame size	Rating (A)	Poles	Withdrawable TOP connections Cat. no.	Withdrawable BOTTOM connections Cat. no.
1	400 to 1600	3	FA31FA16T	FA31FA16B
		4	FA41FA16T	FA41FA16B
1	2000 to 2500	3	FA31FA25T	FA31FA25B
		4	FA41FA25T	FA41FA25B
2	3200	3	FA32FA32T	FA32FA32B
		4	FA42FA32T	FA42FA32B
2	4000	3	FA32FA40T	FA32FA40B
		4	FA42FA40T	FA42FA40B

Cassette only



Basic cassette with flat copper terminals rear connected.

Frame size	Rating (A)	Poles	Cat. no.
1	400 to 1600	3	MPA31C16
		4	MPA41C16
1	2000 to 2500	3	MPA31C25
		4	MPA41C25
2	3200	3	MPA32C32
		4	MPA42C32
2	4000	3	MPA32C40
		4	MPA42C40

Moving Portion only

Basic circuit breaker manually operated,
5 NO and 3 NC auxiliary switches and cluster contacts.

Frame size	Rating (A)	Poles	Cat. no.
1	400	3	MPA31M04
		4	MPA41M04
1	800	3	MPA31M08
		4	MPA41M08
1	1000	3	MPA31M10
		4	MPA41M10
1	1250	3	MPA31M12
		4	MPA41M12
1	1600	3	MPA31M16
		4	MPA41M16
1	2000	3	MPA31M20
		4	MPA41M20
1	2500	3	MPA31M25
		4	MPA41M25
2	3200	3	MPA32M32
		4	MPA42M32
2	4000	3	MPA32M40
		4	MPA42M40

Earthing Device

See page B.6 (BOTTOM)

M-PACT Air Circuit Breaker - TYPE D - 65kA

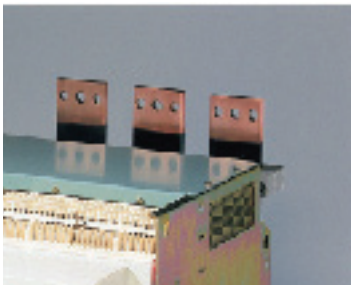
Basic circuit breaker manually operated, 5 NO and 3 NC auxiliary switches.
Withdrawable pattern - basic cir cuit breaker and cassette with flat copper terminals rear connected.
Fixed pattern - basic circuit breaker with rear terminals horizontal.

Withdrawable and Fixed Pattern

Frame size	Rating (A)	Poles	Withdrawable Cat. no.	Fixed Pattern Cat. no.
1	400	3	MPD31W04	MPD31F04
		4	MPD41W04	MPD41F04
1	800	3	MPD31W08	MPD31F08
		4	MPD41W08	MPD41F08
1	1000	3	MPD31W10	MPD31F10
		4	MPD41W10	MPD41F10
1	1250	3	MPD31W12	MPD31F12
		4	MPD41W12	MPD41F12
1	1600	3	MPD31W16	MPD31F16
		4	MPD41W16	MPD41F16
1	2000	3	MPD31W20	MPD31F20
		4	MPD41W20	MPD41F20
1	2500	3	MPD31W25	MPD31F25
		4	MPD41W25	MPD41F25
2	3200	3	MPD32W32	MPD32F32
		4	MPD42W32	MPD42F32
2	4000	3	MPD32W40	MPD32F40
		4	MPD42W40	MPD42F40

Rear 'T' Connections (for cassette only)

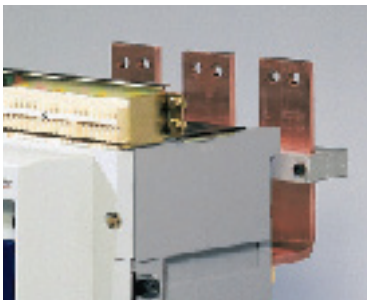
Frame size	Rating (A)	Poles	Pequired Quantity	Cat. no.	Cat. no.
1	400 to 1600	3	6	RT1UOR	Universal
		4	8	RT1UOR	Universal
2	3200	3	6	RT2UNI	Universal
		4	8	RT2UNI	Universal
2	4000	3	Standard	N/A	Vertical
		4	Standard	N/A	Vertical



Front Access Connections

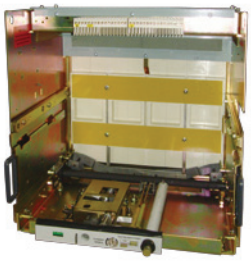
Frame size	Rating (A)	Poles	Withdrawable TOP connections Cat. no.	Withdrawable BOTTOM connections Cat. no.
1	400 to 1600	3	FA31WA16T	FA31WA16B
		4	FA41WA16T	FA41WA16B
1	2000 to 2500	3	FA31WA25T	FA31WA25B
		4	FA41WA25T	FA41WA25B
2	3200	3	FA32WA32T	FA32WA32B
		4	FA42WA32T	FA42WA32B
2	4000	3	FA32WA40T	FA32WA40B
		4	FA42WA40T	FA42WA40B

Front Access Connections



Frame size	Rating (A)	Poles	Withdrawable	
			TOP connections	BOTTOM connections
			Cat. no.	Cat. no.
1	400 to 1600	3	FA31FD16T	FA31FD16B
		4	FA41FD16T	FA41FD16B
1	2000 to 2500	3	FA31FD25T	FA31FD25B
		4	FA41FD25T	FA41FD25B
2	3200	3	FA32FD32T	FA32FD32B
		4	FA42FD32T	FA42FD32B
2	4000	3	FA32FD40T	FA32FD40B
		4	FA42FD40T	FA42FD40B

Cassette only



Basic cassette with flat copper terminals rear connected.

Frame size	Rating (A)	Poles	Cat. no.
1	400 to 1600	3	MPD31C16
		4	MPD41C16
2	3200	3	MPD32C32
		4	MPD42C32
2	4000	3	MPD32C40
		4	MPD42C40

Moving Portion only

Basic circuit breaker manually operated,
5 NO and 3 NC auxiliary switches and cluster contacts.

Frame size	Rating (A)	Poles	Cat. no.
1	400	3	MPD31M04
		4	MPD41M04
1	800	3	MPD31M08
		4	MPD41M08
1	1000	3	MPD31M10
		4	MPD41M10
1	1250	3	MPD31M12
		4	MPD41M12
1	1600	3	MPD31M16
		4	MPD41M16
1	2000	3	MPD31M20
		4	MPD41M20
1	2500	3	MPD31M25
		4	MPD41M25
2	3200	3	MPD32M32
		4	MPD42M32
2	4000	3	MPD32M40
		4	MPD42M40

Earthing Device

Frame size	Rating (A)	Poles	Cat. no.
1	400 to 1600	3	EDF13P16
		4	EDF14P16
1	2000 to 2500	3	EDF13P25
		4	EDF14P25
2	3200 to 4000	3	EDF23P40
		4	EDF24P40

M-PACT Air Circuit Breaker - TYPE H_1,H_2 - 80kA

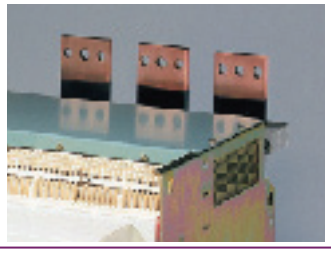
Basic circuit breaker manually operated, 5 NO and 3 NC auxiliary switches.
Withdrawable pattern - basic circuit breaker and cassette with flat copper terminals rear connected.
Fixed pattern - basic circuit breaker with rear terminals horizontal.

Withdrawable and Fixed Pattern

Frame size	Rating (A)	Poles	Withdrawable Cat. no.	Fixed Pattern Cat. no.	Withdrawable Cat. no.	Fixed Pattern Cat. no.
2	800	3	$MPH_1$32W08	$MPH_1$32F08	$MPH_2$32W08	$MPH_2$32F08
		4	$MPH_1$4L2W08	$MPH_1$4L2F08	$MPH_2$4L2W08	$MPH_2$4L2F08
2	1000	3	$MPH_1$32W10	$MPH_1$32F10	$MPH_2$32W10	$MPH_2$32F10
		4	$MPH_1$4L2W10	$MPH_1$4L2F10	$MPH_2$4L2W10	$MPH_2$4L2F10
2	1250	3	$MPH_1$42W12	$MPH_1$32F12	$MPH_2$32W12	$MPH_2$32F12
		4	$MPH_1$4L2W12	$MPH_1$4L2F12	$MPH_2$4L2W12	$MPH_2$4L2F12
2	1600	3	$MPH_1$32W16	$MPH_1$32F16	$MPH_2$32W16	$MPH_2$32F16
		4	$MPH_1$4L2W16	$MPH_1$4L2F16	$MPH_2$4L2W16	$MPH_2$4L2F16
2	2000	3	$MPH_1$32W20	$MPH_1$32F20	$MPH_2$32W20	$MPH_2$32F20
		4	$MPH_1$4L2W20	$MPH_1$4L2F20	$MPH_2$4L2W20	$MPH_2$4L2F20
2	2500	3	$MPH_1$32W25	$MPH_1$32F25	$MPH_2$32W25	$MPH_2$32F25
		4	$MPH_1$4L2W25	$MPH_1$4L2F25	$MPH_2$4L2W25	$MPH_2$4L2F25
2	3200	3	$MPH_1$32W32	$MPH_1$32F32	$MPH_2$32W32	$MPH_2$32F32
		4	$MPH_1$4L2W32	$MPH_1$4L2F32	$MPH_2$4L2W32	$MPH_2$4L2F32
2	4000	3	$MPH_1$32W40	$MPH_1$32F40	$MPH_2$32W40	$MPH_2$32F40
		4	$MPH_1$4L2W40	$MPH_1$4L2F40	$MPH_2$4L2W40	$MPH_2$4L2F40

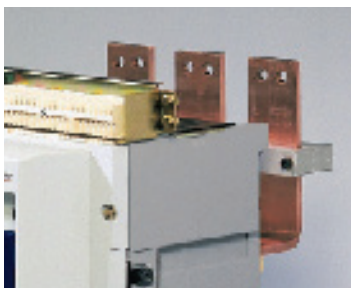
Rear 'T' Connections (for cassette only)

Frame size	Rating (A)	Poles	Required Quantity	Cat. no.
2	800 - 3200	3	6	RT2UNI
		4	8	RT2UNI
2	4000	3	Standard	N/A
		4	Standard	N/A



Front Access Connections

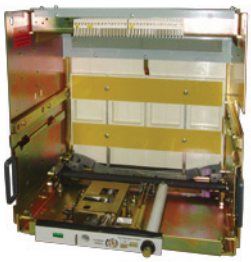
Frame size	Rating (A)	Poles	Withdrawable TOP connections Cat. no.	Withdrawable BOTTOM connections Cat. no.
2	800 - 3200	3	FA42WH32T	FA32WH32B
		4	FA42WH32T	FA42WH32B
2	4000	3	FA32WH40T	FA42WH40B
		4	FA42WH40T	FA42WH40B



Front Access Connections

Frame size	Rating (A)	Poles	Withdrawable TOP connections Cat. no.	Withdrawable BOTTOM connections Cat. no.
2	800 - 3200	3	FA32FH32T	FA32FH32B
		4	FA42FH32T	FA42FH32B
2	4000	3	FA32FH40T	FA32FH40B
		4	FA42FH40T	FA42FH40B

Cassette only



Basic cassette with flat copper terminals rear connected.

Frame size	Rating (A)	Poles	Cat. no.
2	800 - 3200	3	MPH32C32
		4	MPH42C32
2	4000	3	MPH32C40
		4	MPH42C40

Moving Portion only

Basic circuit breaker manually operated,
5 NO and 3 NC auxiliary switches and cluster contacts.

Frame size	Rating (A)	Poles	Cat. no.	Cat. no.
2	800	3	$MPH_1$32M08	$MPH_2$32M08
		4	$MPH_1$42M08	$MPH_2$42M08
2	1000	3	$MPH_1$32M10	$MPH_2$32M10
		4	$MPH_1$42M10	$MPH_2$42M10
2	1250	3	$MPH_1$32M12	$MPH_2$32M12
		4	$MPH_1$42M12	$MPH_2$42M12
2	1600	3	$MPH_1$32M16	$MPH_2$32M16
		4	$MPH_1$42M16	$MPH_2$42M16
2	2000	3	$MPH_1$32M20	$MPH_2$32M20
		4	$MPH_1$42M20	$MPH_2$42M20
2	2500	3	$MPH_1$32M25	$MPH_2$32M25
		4	$MPH_1$42M25	$MPH_2$42M25
2	3200	3	$MPH_1$32M32	$MPH_2$32M32
		4	$MPH_1$42M32	$MPH_2$42M32
2	4000	3	$MPH_1$32M40	$MPH_2$32M40
		4	$MPH_1$42M40	$MPH_2$42M40

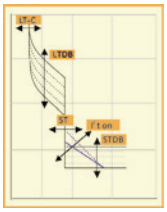
Earthing Device

Frame size	Rating (A)	Poles	Cat. no.
2	800 - 4000	3	EDF23P40
		4	EDF24P40

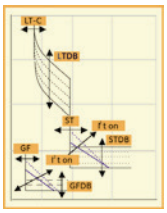
Factory Mounted Trip Units

MPRO-27

Basic functionality



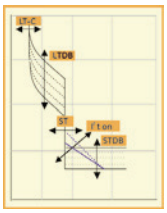
Extended functionality



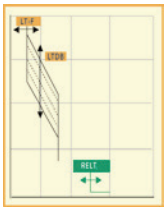
Functionality and application		
MPRO-27 trip unit	**For Frame 1**	GL100M3-SF
LT-C 0.4-1 x In = Ir	**For Frame 2**	GL200M3-SF
LTDB		
ST I^2t ON or OFF		
STDB		
MPRO-27 trip unit	**For Frame 1**	GL100M5-SF
LT-C 0.4-1 x In = Ir	**For Frame 2**	GL200M5-SF
LTDB		
ST I^2t ON or OFF		
STDB		
GF sum. I^2t ON or OFF		
GFDB		

MPRO-50

Basic functionality



Extended functionality



MPRO-50L	**For Frame 1**	GH100M7-6SF
	LT band choice (LT-C or LT-F)	
LT-C 0.4-1 x In = Ir	Dual GF protection (Res./SUM or CT)	
-ORLT-	Relt Instantaneous &	
F 0.4-1 x In = Ir	Modbus Communiction	
ST		
STD		
GF sum. I^2t ON or OFF	**For Frame 2**	GH200M7-6SF
-AND/ORGF	LT band choice (LT-C or LT-F)	
CR I^2t ON or OFF	Dual GF protection (Res./SUM or CT)	
GFDB	Relt Instantaneous &	
I	Modbus Communiction	
RELT		
Input supply 24V AC(1)		
MPRO-50H	**For Frame 1**	GQ100M7-6SF
	LT band choice (LT-C or LT-F)	
LT-C 0.4-1 x In = Ir	Dual GF protection (Res./SUM or CT)	
-ORLT-	Relt Instantaneous &	
F 0.4-1 x In = Ir	Modbus Communiction	
ST		
STD		
GF sum. I^2t ON or OFF	**For Frame 2**	GQ200M7-6SF
-AND/ORGF	LT band choice (LT-C or LT-F)	
CR I^2t ON or OFF	Dual GF protection (Res./SUM or CT)	
GFDB	Relt Instantaneous &	
I	Modbus Communiction	
RELT		
Input supply 110-130V DC		
or 110-250V AC(1)		

Accessories

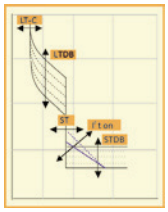
Designation	
Power supply 222-265V AC - 24V DC 0.22A(1)	MPROAPU
Digital test kit	GTUTK20

(1) To set GF settings below 0.2 x and to allow use of the 4 remote in- and 4 relay outputs andauciliary supply is required (GAPU unit can be used for 24V unit).

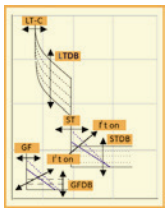
Spare Trip Units[1]

MPRO-27

Basic functionality



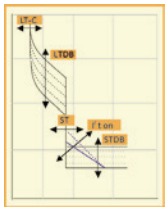
Extended functionality



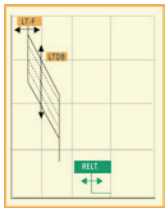
Functionality and application		
MPRO-27 trip unit	**For Frame 1**	GL100M3-SR
LT-C 0.4-1 x In = Ir	**For Frame 2**	GL200M3-SR
LTDB		
ST I^2t ON or OFF		
STDB		
MPRO-27 trip unit	**For Frame 1**	GL100M5-SR
LT-C 0.4-1 x In = Ir	**For Frame 2**	GL200M5-SR
LTDB		
ST I^2t ON or OFF		
STDB		
GF sum. I^2t ON or OFF		
GFDB		

MPRO-50

Basic functionality

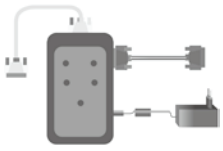


Extended functionality



MPRO-50L	**For Frame 1**	GH100M7-6SR
	LT band choice (LT-C or LT-F)	
LT-C 0.4-1 x In = Ir	Dual GF protection (Res./SUM or CT)	
-ORLT-	Relt Instantaneous &	
F 0.4-1 x In = Ir	Modbus Communiction	
ST		
STD		
GF sum. I^2t ON or OFF	**For Frame 2**	GH200M7-6SR
-AND/ORGF	LT band choice (LT-C or LT-F)	
CR I^2t ON or OFF	Dual GF protection (Res./SUM or CT)	
GFDB	Relt Instantaneous &	
I	Modbus Communiction	
RELT		
Input supply 24V AC[2]		
MPRO-50H	**For Frame 1**	GQ100M7-6SF
	LT band choice (LT-C or LT-F)	
LT-C 0.4-1 x In = Ir	Dual GF protection (Res./SUM or CT)	
-ORLT-	Relt Instantaneous &	
F 0.4-1 x In = Ir	Modbus Communiction	
ST		
STD		
GF sum. I^2t ON or OFF	**For Frame 2**	GQ200M7-6SF
-AND/ORGF	LT band choice (LT-C or LT-F)	
CR I^2t ON or OFF	Dual GF protection (Res./SUM or CT)	
GFDB	Relt Instantaneous &	
I	Modbus Communiction	
RELT		
Input supply 110-130V DC		
or 110-250V AC[2]		

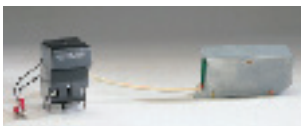
Accessories



Designation	
Power supply 222-265V AC - 24V DC 0.22A[2]	MPROAPU
Digital test kit	GTUTK20

(1) Please specify breaker serial number on ordering.

(2) To set GF settings below 0.2 x and to allow use of the 4 remote in- and 4 relay outputs andauciliary supply is required (GAPU unit can be used for 24V unit).



Withdrawable and Fixed Pattern

	Range	Voltage	Cat. no.
Shunt trip (ST)	24/30 V	DC	ST30
	48 V	DC	ST48
	110/130 V	AC/DC	ST130
	220/250 V	AC/DC	ST250
	380/440 V	AC	ST440
Motor operator (MOP)	24/30 V	DC	MOP30
	48 V	DC	MOP48
	60 V	DC	MOP60
	110/130 V	AC	MOP130A
	110/130 V	DC	MOP130D
	220/250 V	AC	MOP250A
	220/250 V	DC	MOP250D
	380/440 V	AC	MOP440A
Closing coil (CC)	24/30 V	DC	CC30
	48 V	DC	CC48
	110/130 V	AC/DC	CC130
	220/250 V	AC/DC	CC250
	300/440 V	AC	CC440
Undervoltage release (UV)	48 V	DC	UV48
	110/130 V	AC	UV130A
	110/130 V	DC	UV130D
	220/250 V	AC	UV250
	380/440 V	AC	UV440
Undervoltage release time delayed (UVTD)	48 V	DC	UVTD48
	220/250 V	AC	UVTD250
	380/440 V	AC	UVTD440
	250 V	AC/DC	CSWFF
	250 V	AC/DC	CSWL
Springs charged Signal (× × 1 n/o)			SCC

Mechanical Accessories

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.
1 & 2	Withdrawable	3	2WCI3PW	1 & 2	Withdrawable	3	B13WCI3PW
		4	2WCI4PW			4	B13WCI4PW
	Fixed	3	2WCI3PF		Fixed	3	B13WCI3PF
		4	2WCI4PF			4	B13WCI4PF

2 from 3 way Interlocking			Type C	Type D	Cable length for interlocks	
Frame size	Type	Poles	Cable Cat. no.	Cable Cat. no.	Item	Cat. no.
1 & 2	Withdrawable	3	C23WCI3PW	D23WCI3PW	1.6 metre length cable	160BCMCI
		4	C23WCI4PW	D23WCI4PW	2.0 metre length cable	200BCMCI
	Fixed	3	C23WCI3PF	D23WCI3PF	3.0 metre length cable	300BCMCI
		4	C23WCI4PF	D23WCI4PF		

Please refer to page A.23 for available cable configurations.

Interlocks

Item	Cat. no.
Ronis Key breaker Interlock (factory fitted)(2)	RONLOKFF
Ronis Key breaker Interlock (supplied loose)(2)	RONWKEY
Ronis Key breaker Interlock(1)	RONLOK
Ronis Key Cassette Interlock(factory fitted)(2)	RONCASFF
Ronis Key Cassette Interlock(supplied loose)(2)	RONCASLD
Ronis Key Cassette Interlock(supplied loose)(1)	RONCASNK

Miscellaneous

Item	Cat. no.
Mechanical Operations Counter	MOC
Left Hand Door Interlock	DILHS
Right Hand Door Interlock	DIRHS
Mis-Insertion Device	ACBMID
IP54 Door	IP54DOOR
Lifting Truck	ACBLIFT

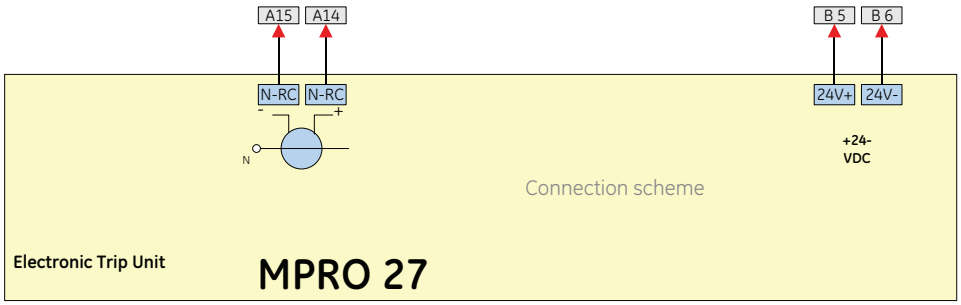
(1) Without lock and key
(2) With lock and key

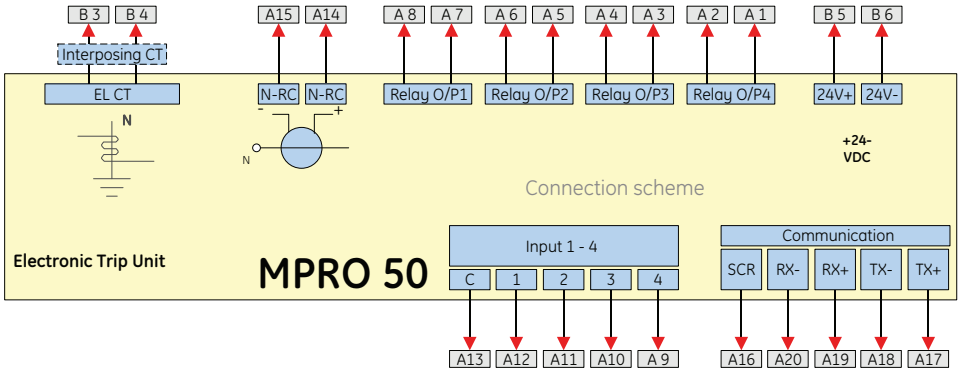
Air circuit breakers 400A-4000A

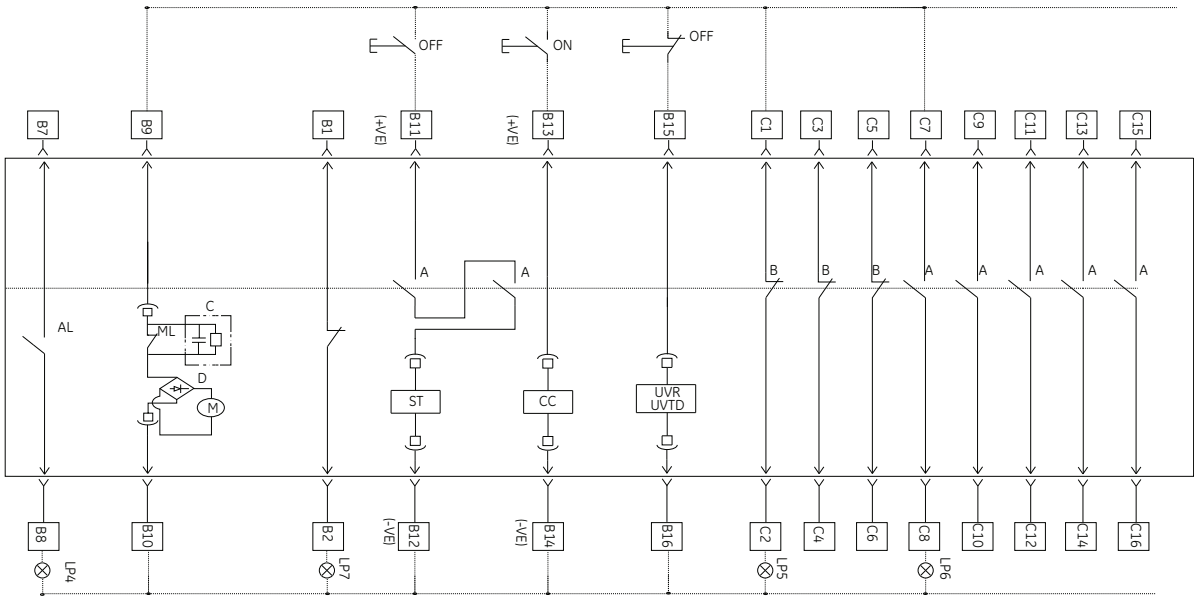
Wiring Diagrams
Dimensional drawings

Wiring Diagrams

Mpro 27 & 50 Connection Scheme







Breaker accessories

Frame accessories

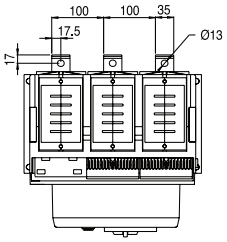
key	
LP1	Disconnected indication
LP2	Test indication
LP3	Connected indication
LP4	ACB tripped indication
LP5	ACB OFF indication
LP6	ACB ON indication
LP7	Motor changing indicator
CT	POWER CT
RC	Rogowski coils

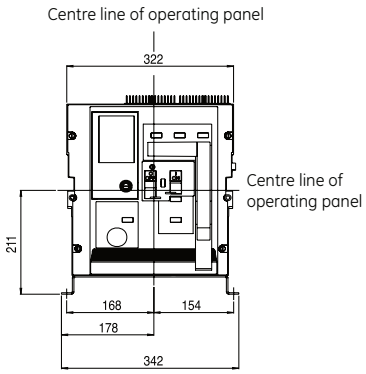
Breaker accessories

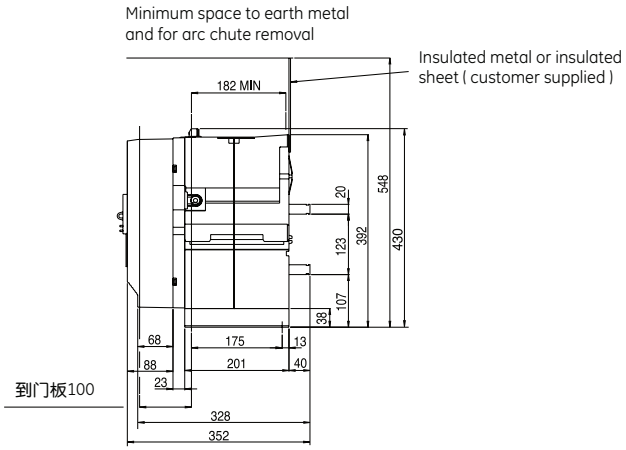
D	Rectifier
ML	Charging motor limit switch
M	Closing spring charging motor
ST	Shunt trip
CC	Closing coil
UVR	Under voltage release
UVTD	Time delayed undervoltage release
A	Auxiliary contacts (NO)
B	Auxiliary contacts (NC)
AL	M-PRO trip alarm (N/O)

Dimensional drawings

Horizontal, rear access connection
Fixed pattern
Type A-3 pole- Frame size 1, In=400A to 1600A

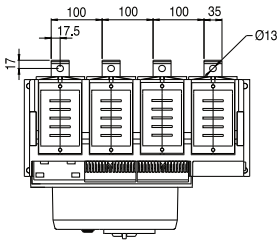


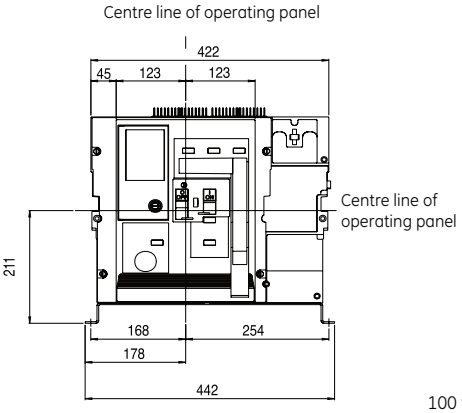


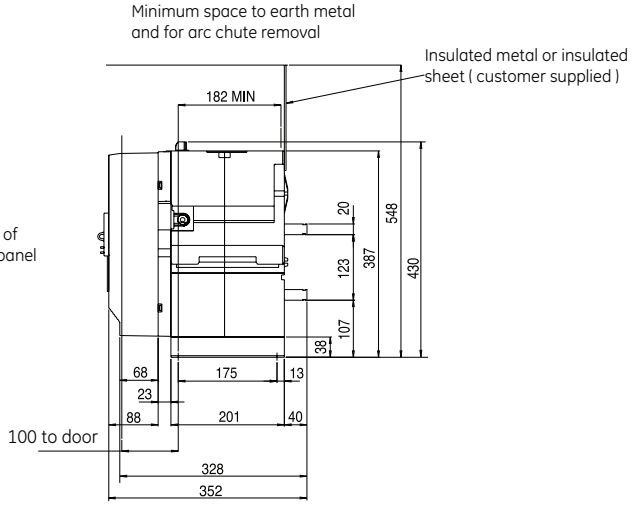


Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

Type A-4 pole- Frame size 1, In=400A to 1600A

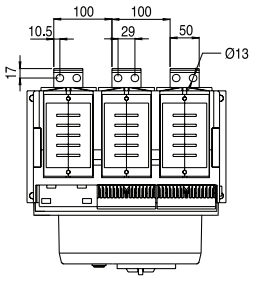


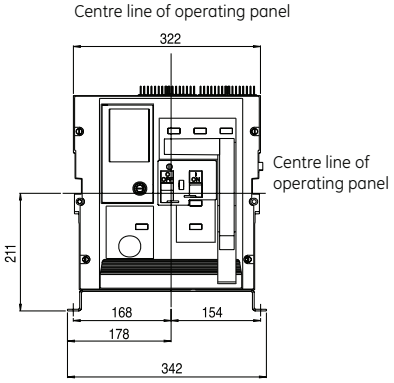


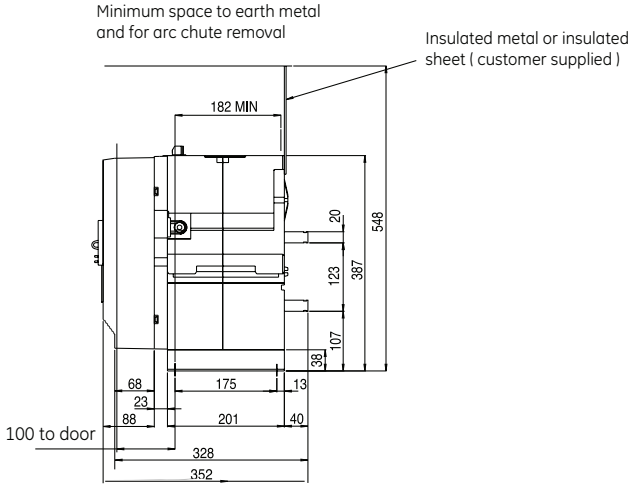


Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

Horizontal, rear access connection
Fixed pattern
Type D-3 pole- Frame size 1, In=400A to 1600A

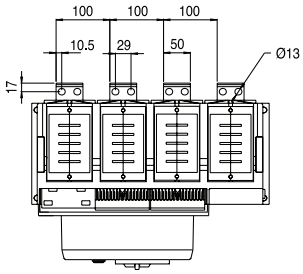


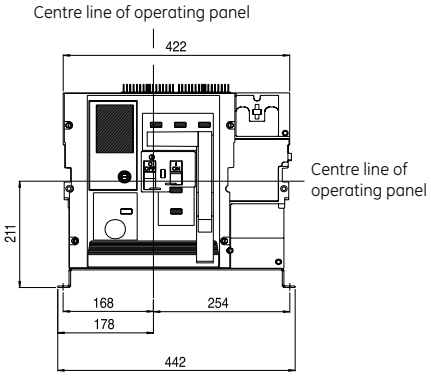


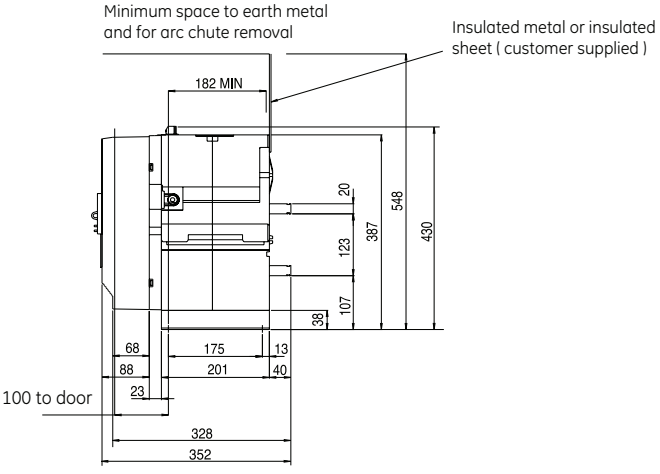


Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

Type D-4 pole- Frame size 1, In=400A to 1600A

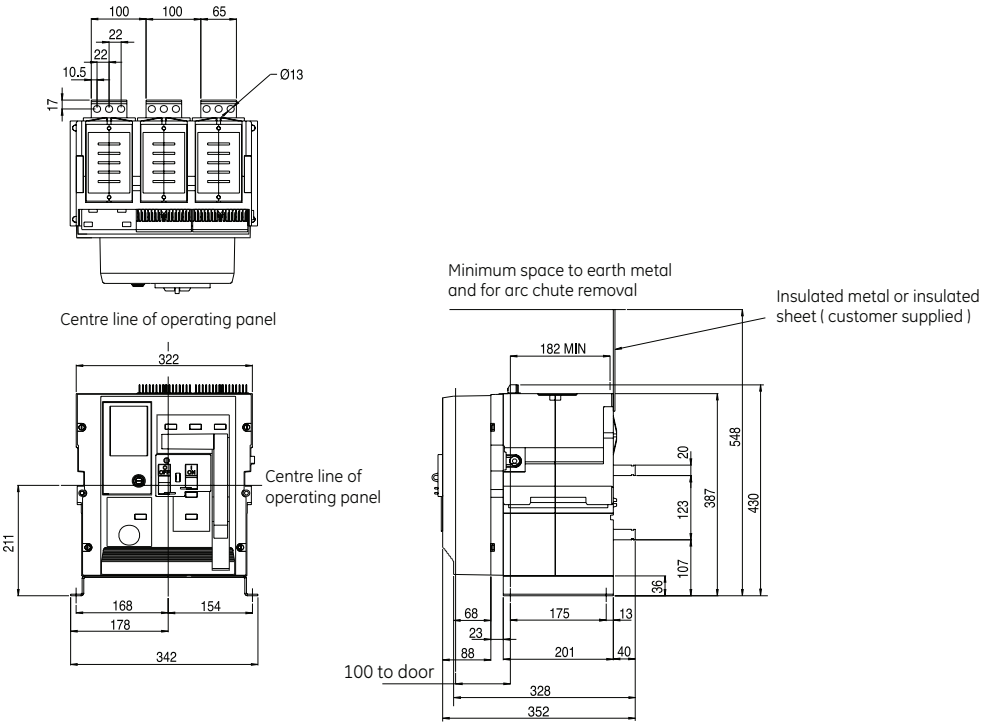






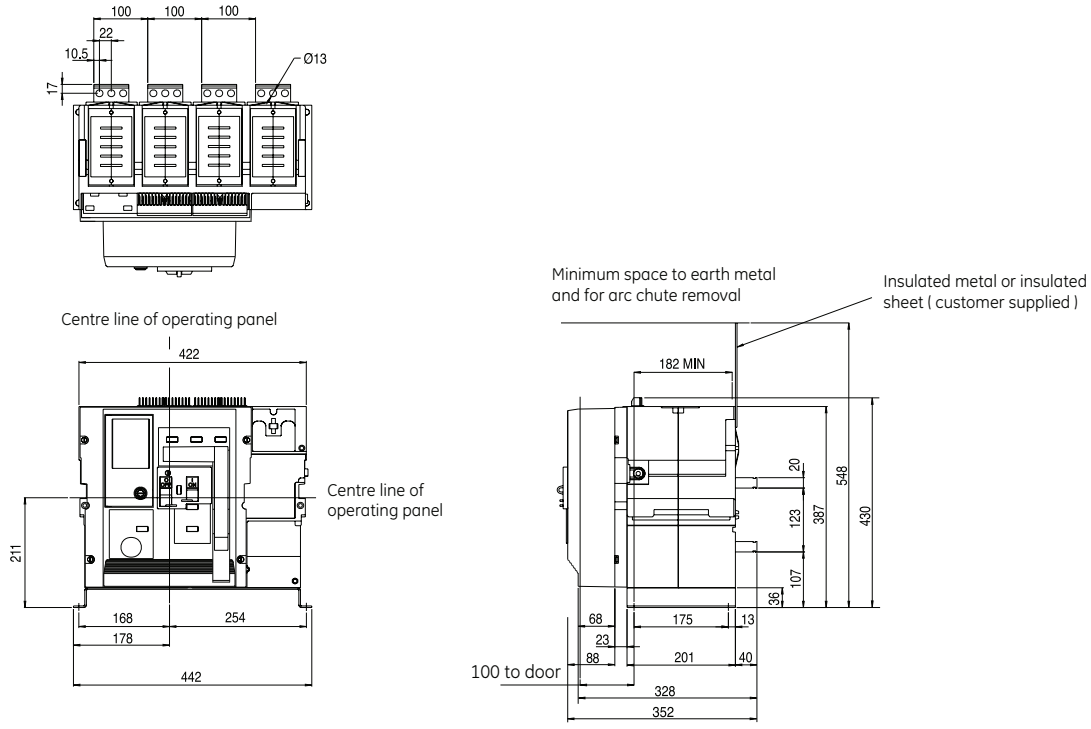
Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

Horizontal, rear access connection
Fixed pattern
Type A, D-3 pole- Frame size 1, In=2000A to 2500A



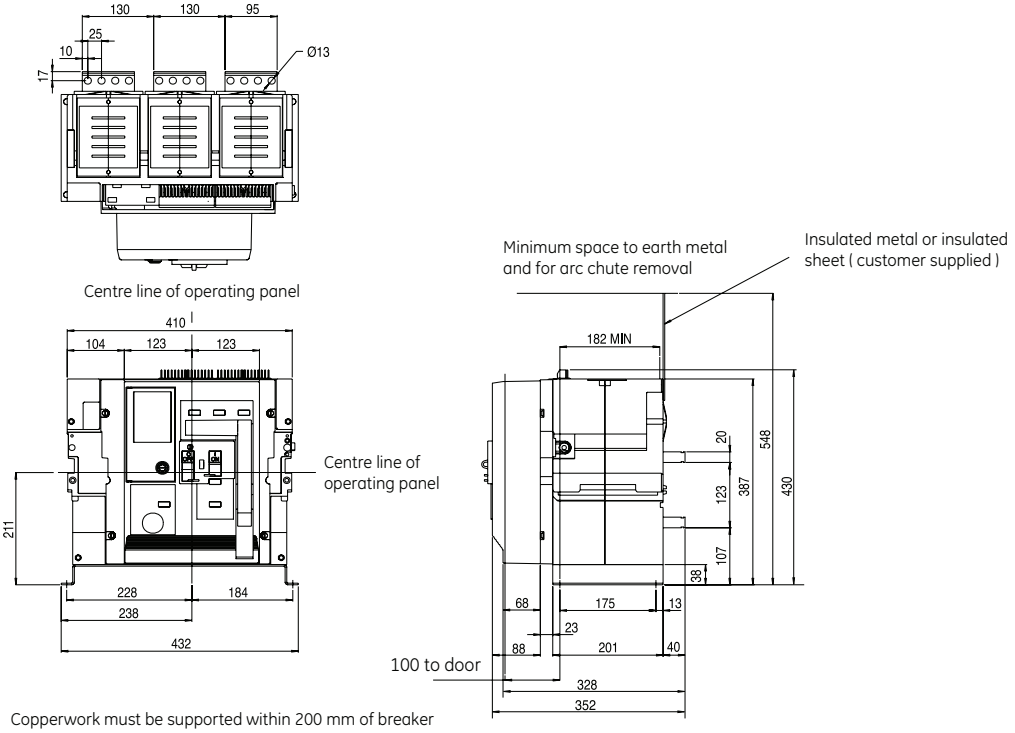
Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

Type A, D-4 pole- Frame size 1, In=2000A to 2500A



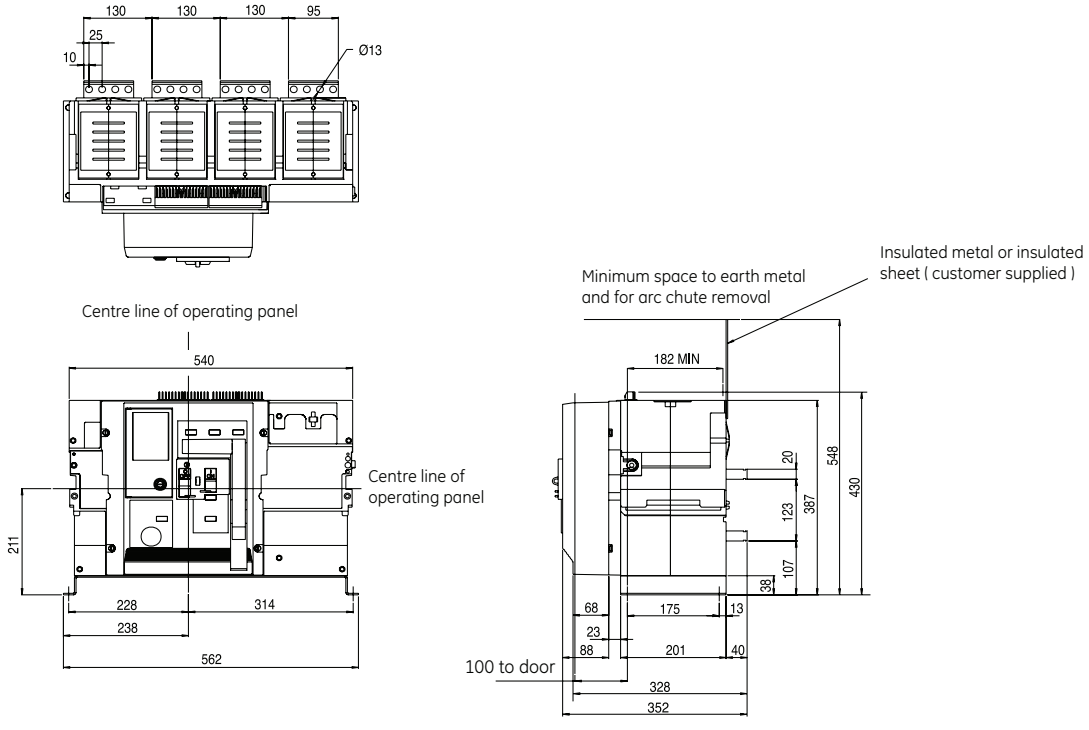
Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

Horizontal, rear access connection
Fixed pattern
Type A, D-3 pole- Frame size 2, In=3200A to 4000A
Type H-3 pole- Frame size 2, In=800A to 4000A



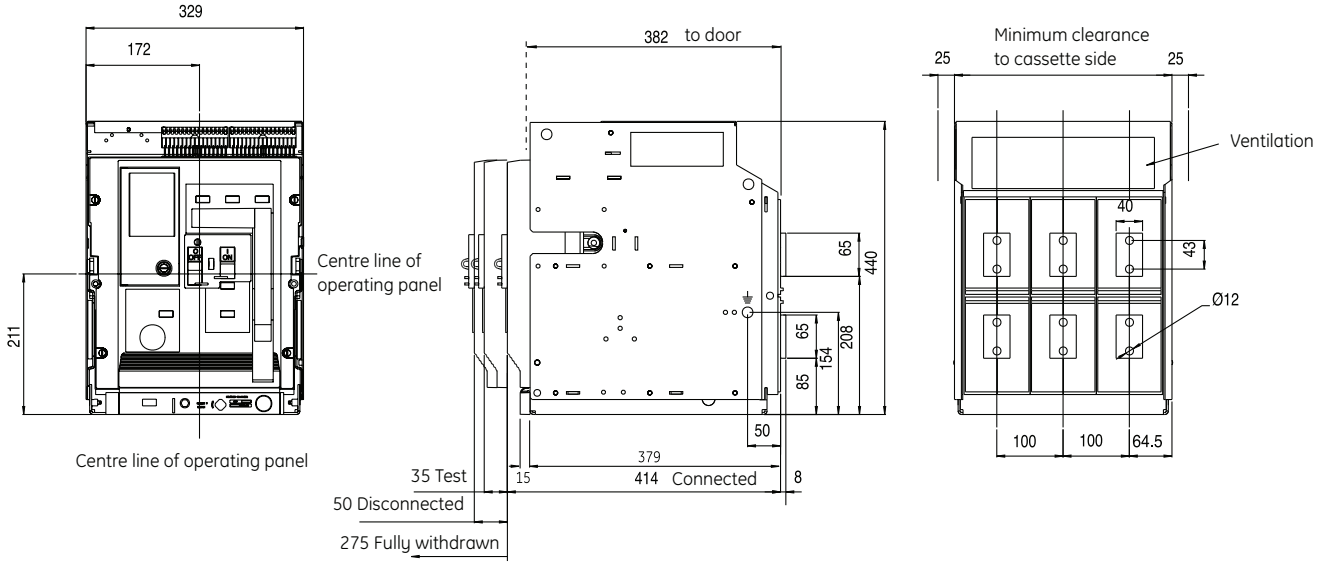
Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

Type A, D-4 pole- Frame size 2, In=3200A to 4000A
Type H-4 pole- Frame size 2, In=800A to 4000A



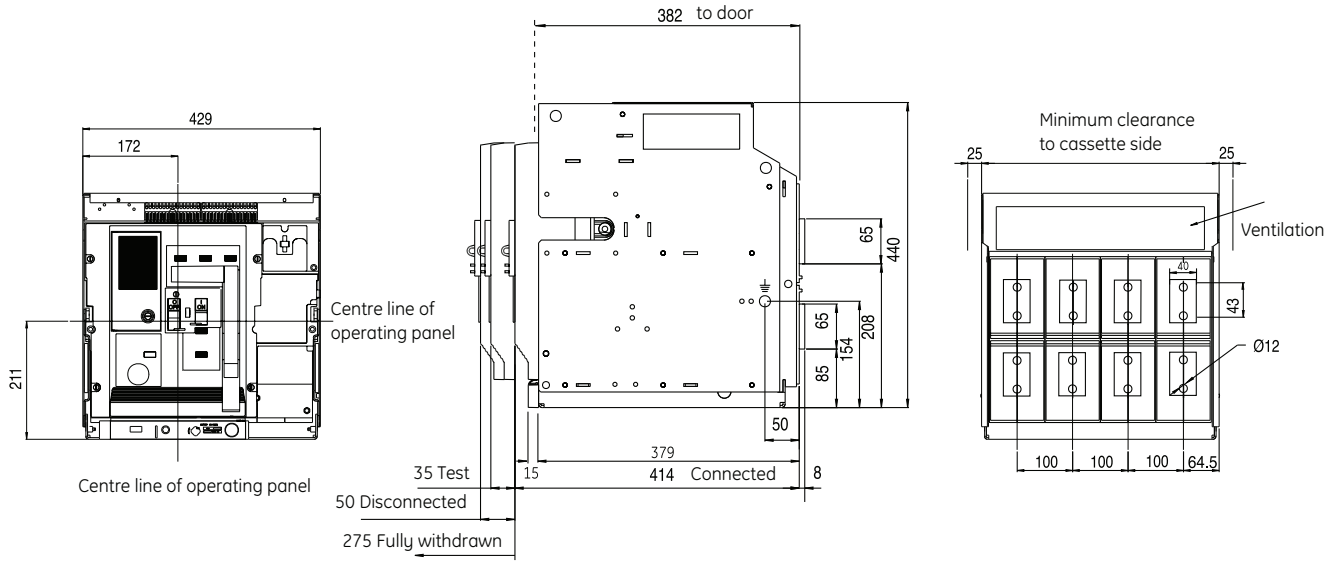
Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

Rear access connection
Withdrawable pattern
Type A-3 pole- Frame size 1, In=400A to 1600A



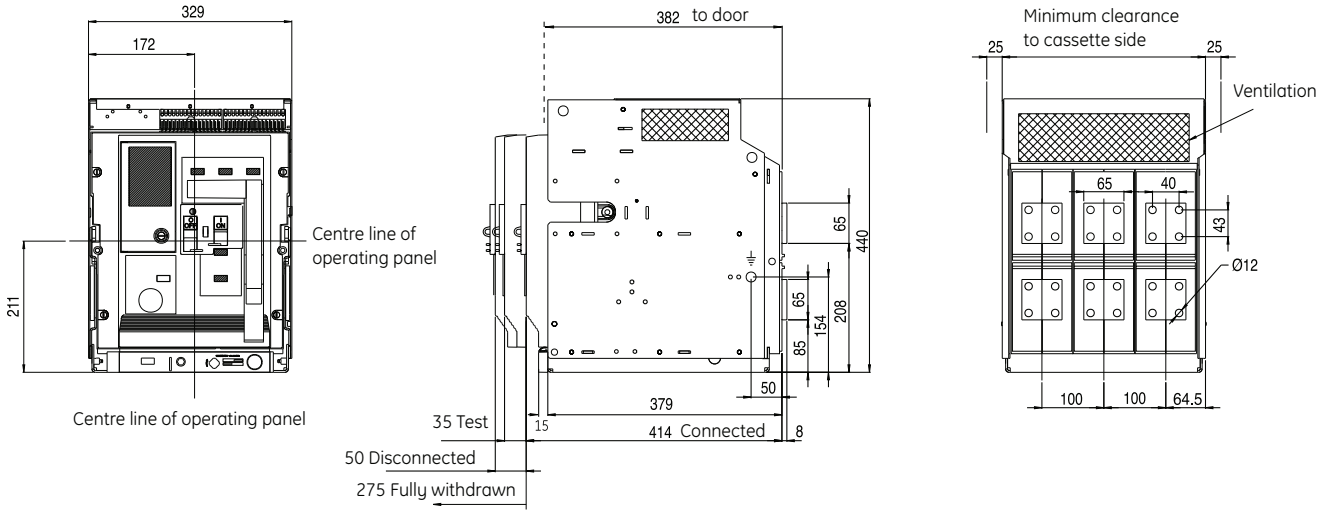
Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

Type A-4 pole- Frame size 1, In=400A to 1600A



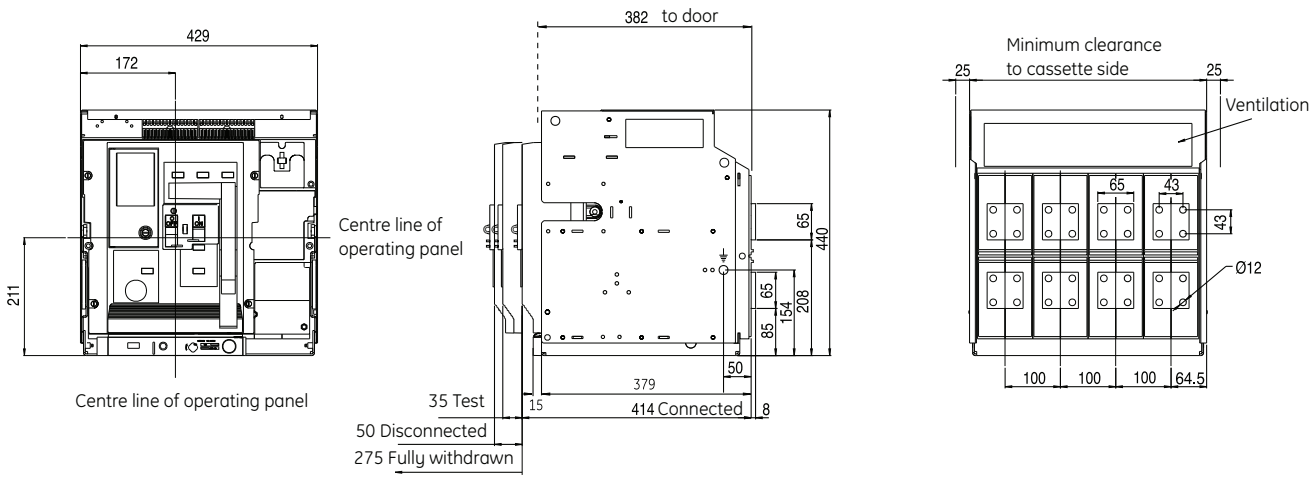
Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

Rear access connection
Withdrawable pattern
Type A-3 pole- Frame size 1, In=2000A & 2500A
Type D-3 pole- Frame size 1, In=400A to 2500A



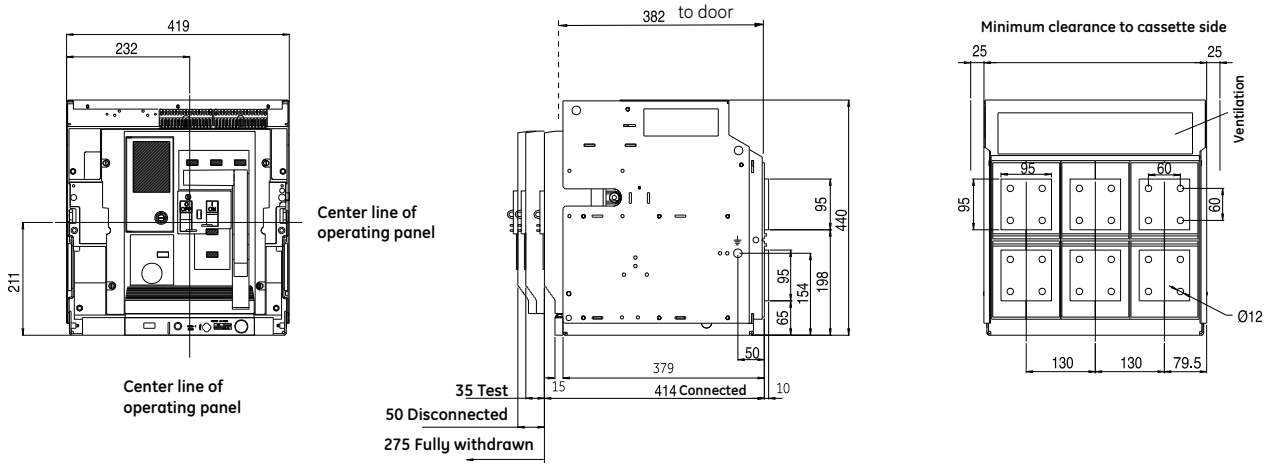
Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

Type A-4 pole- Frame size 1, In=2000A & 2500A
Type D-4 pole- Frame size 1, In=400A to 2500A



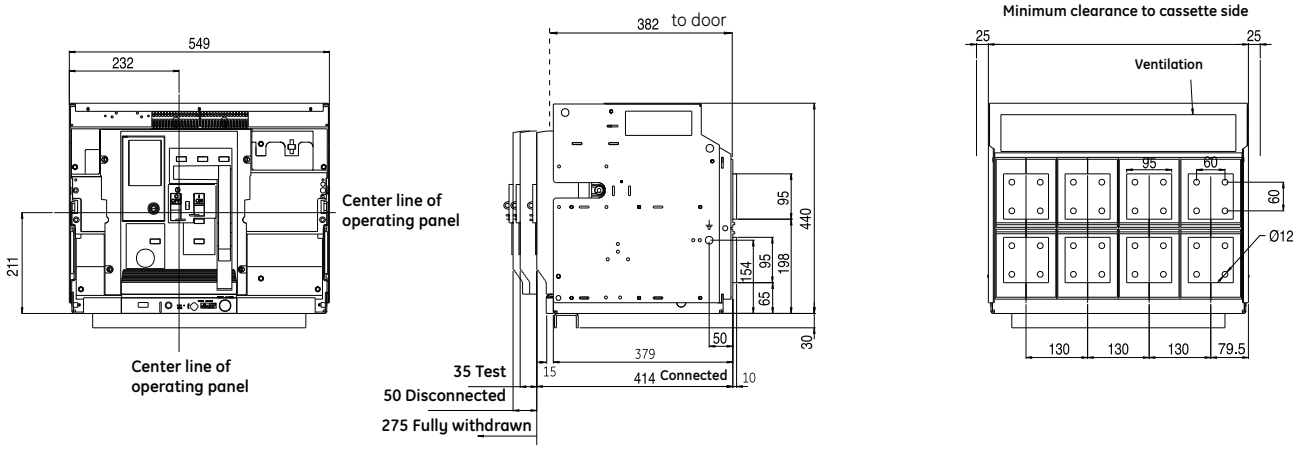
Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

Rear access connection
Withdrawable pattern
Type A, D-3 pole- Frame size 2, In=3200A
Type H-3 pole- Frame size 2, In=800A to 3200A



Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

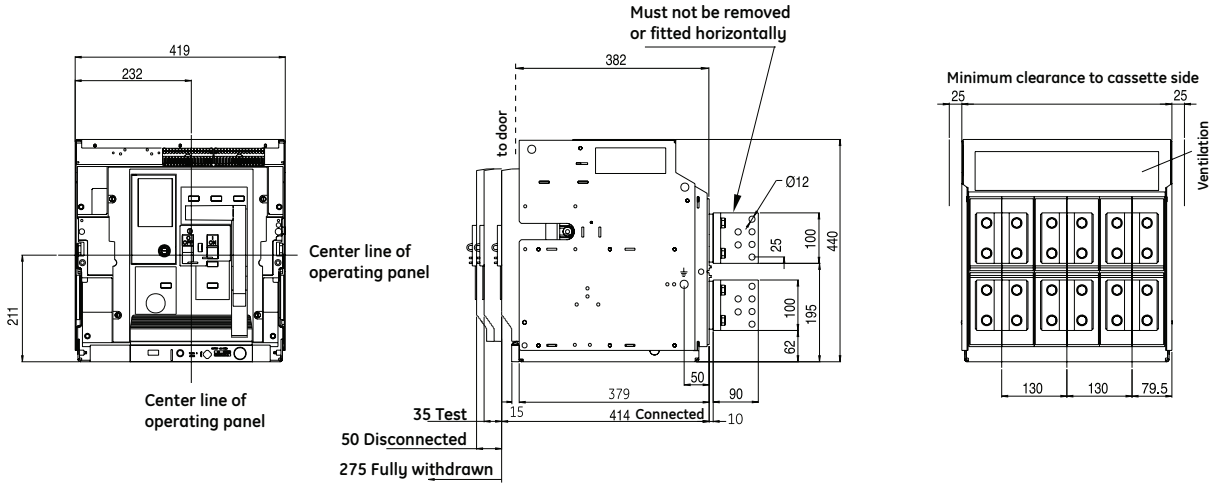
Type A, D-4 pole- Frame size 2, In=3200A
Type H-4 pole- Frame size 2, In=800A to 3200A



Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

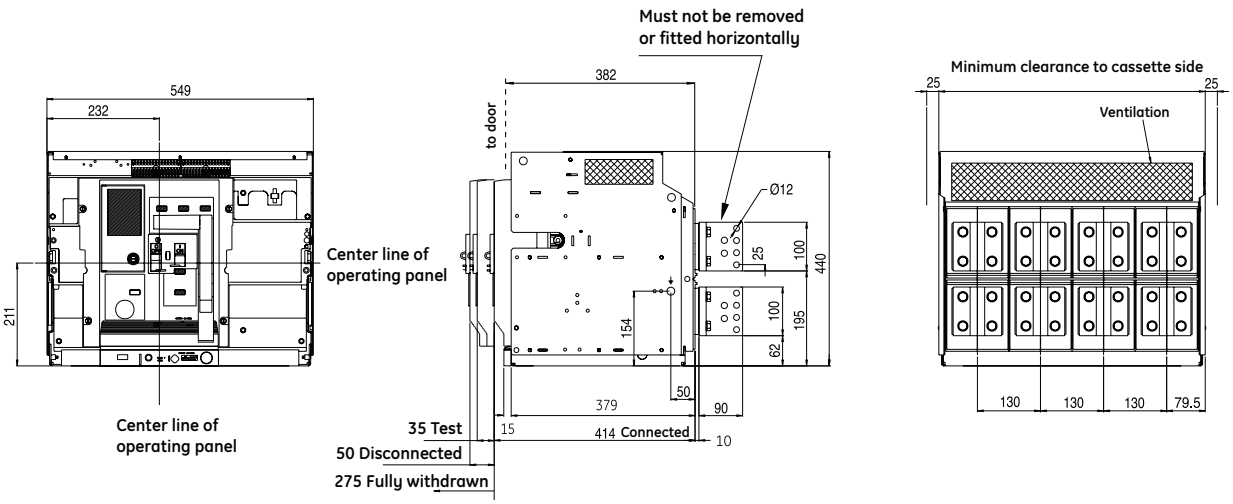
Rear access connection
Withdrawable pattern

Type A, D,H - 3 pole - Frame size 2, In=4000A



Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

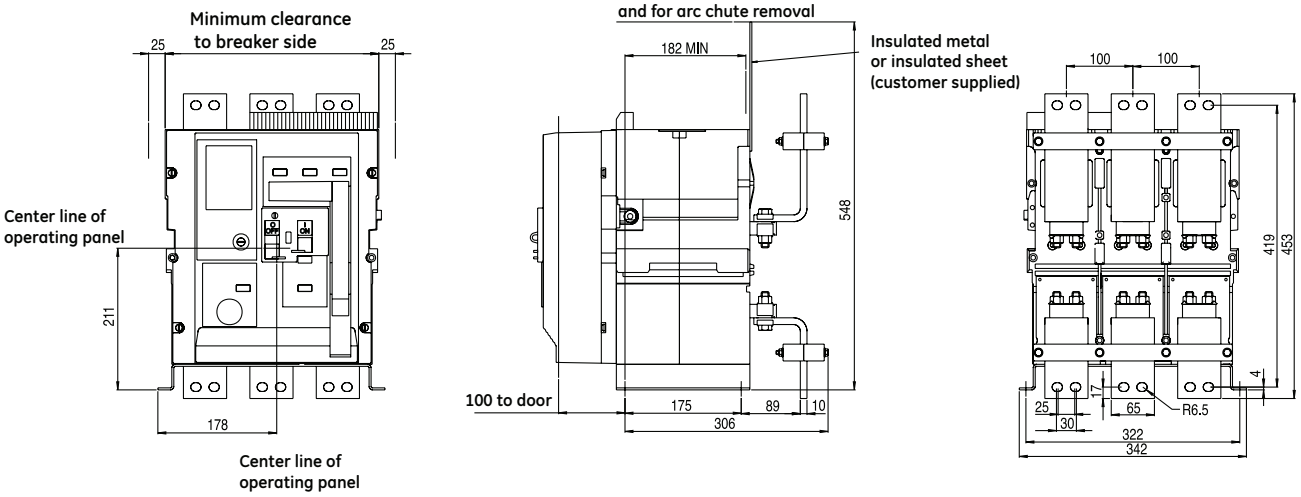
Type A, D,H - 4 pole - Frame size 2, In=4000A



Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

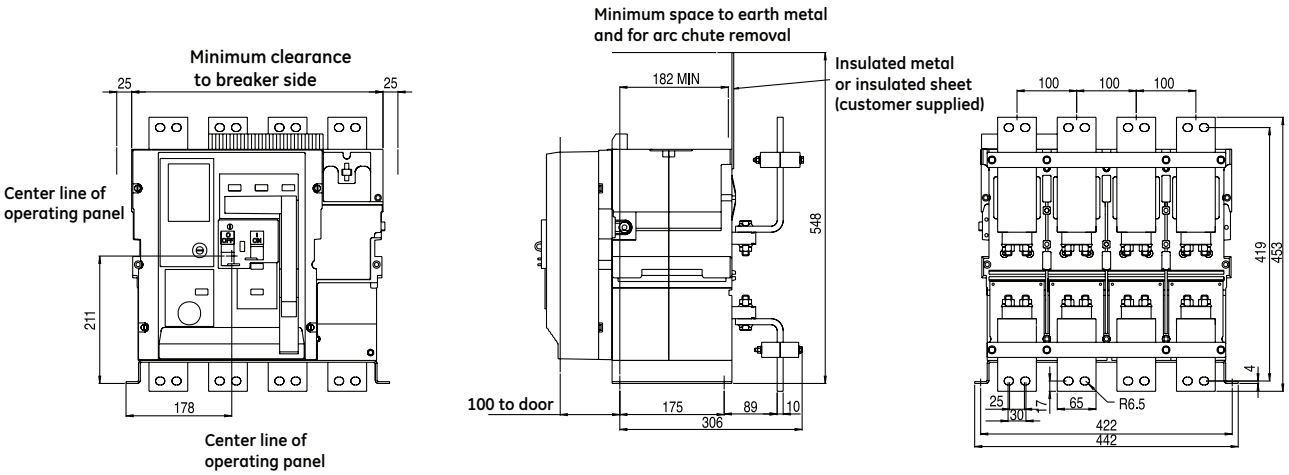
Front access connection
Fixed pattern

Type A, D - 3 pole - Frame size 1, In = 400A to 1600A



Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

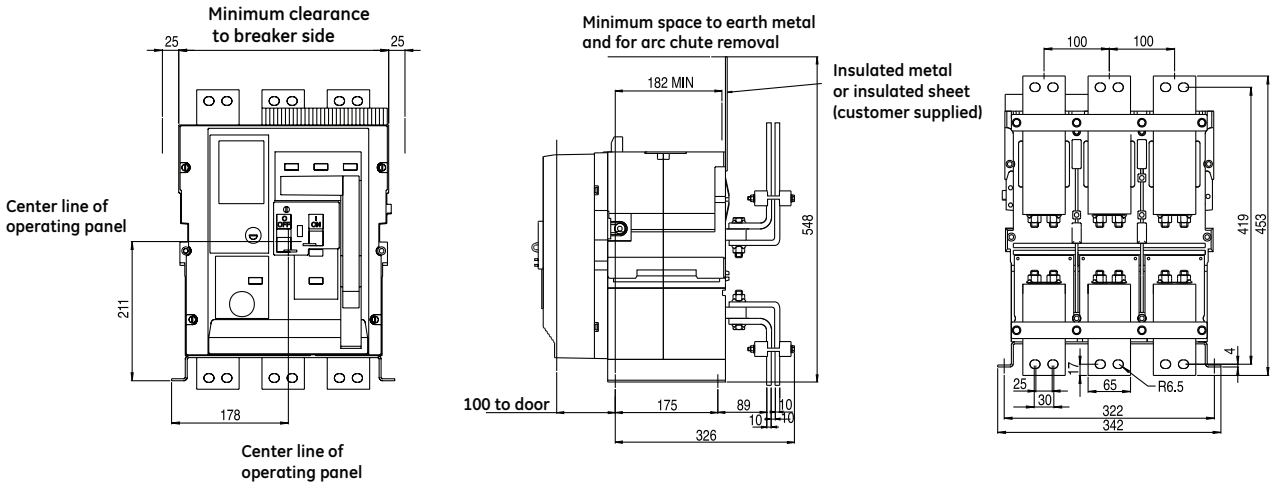
Type A, D - 4 pole - Frame size 1, In = 400A to 1600A



Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

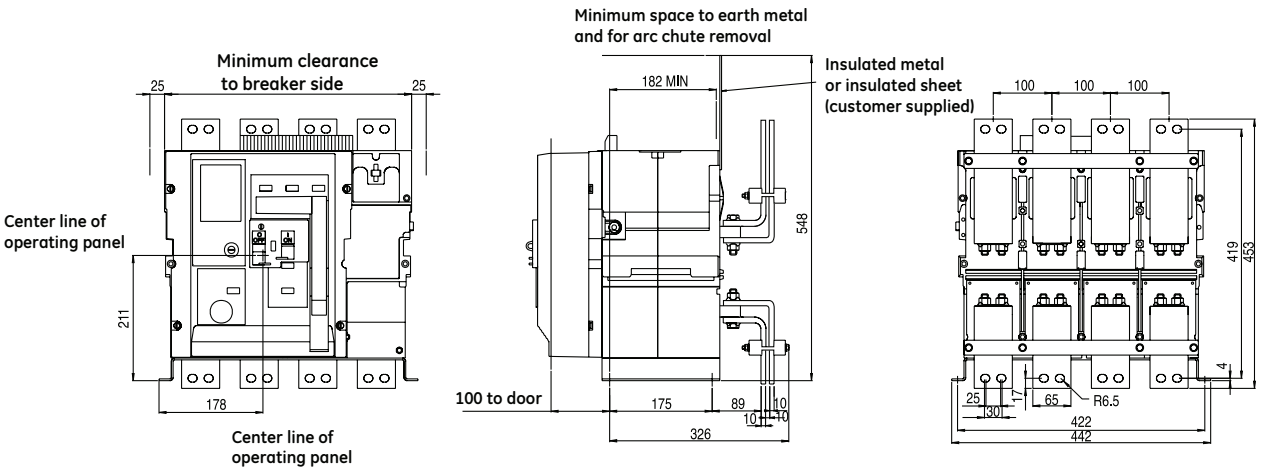
Front access connection
Fixed pattern

Type A, D - 3 pole - Frame size 1, In = 2000A to 2500A



Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

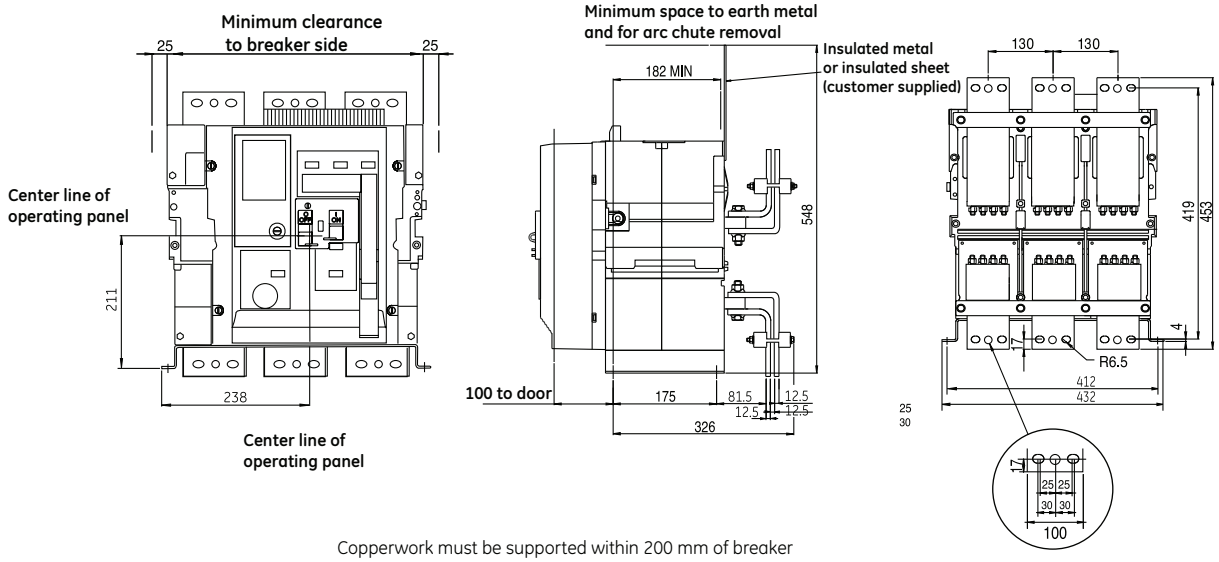
Type A, D - 4 pole - Frame size 1, In = 2000A to 2500A



Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

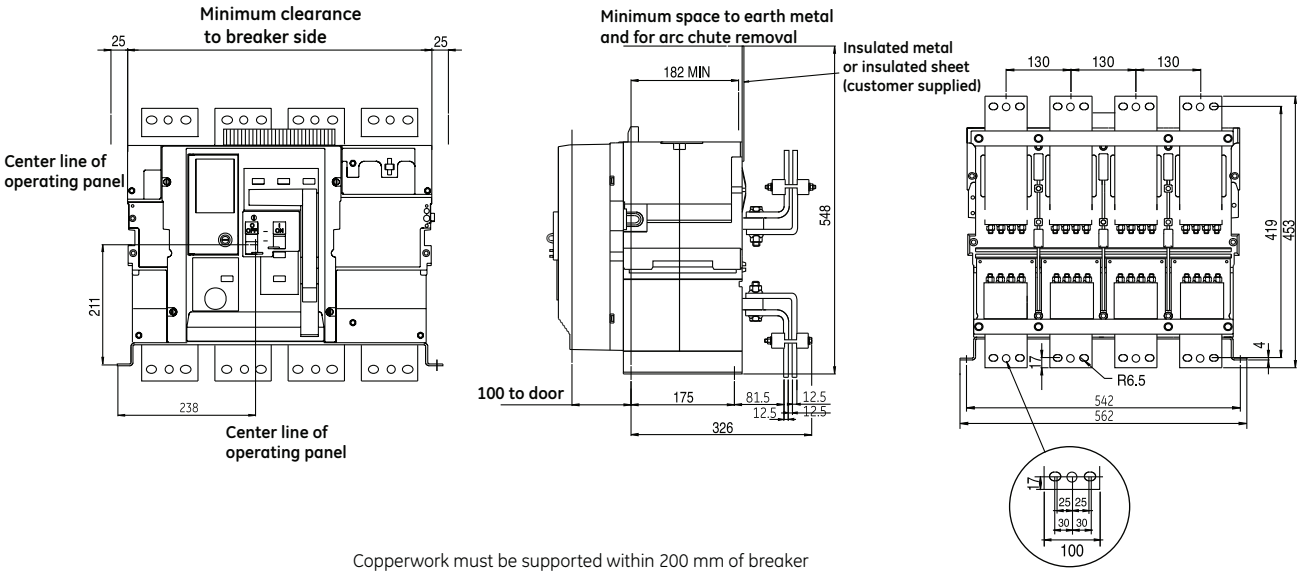
Front access connection
Fixed pattern

Type A, D - 3 pole - Frame size 2, In = 3200A to 4000A
Type H - 3 pole - Frame size 2, In = 800A to 4000A



Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

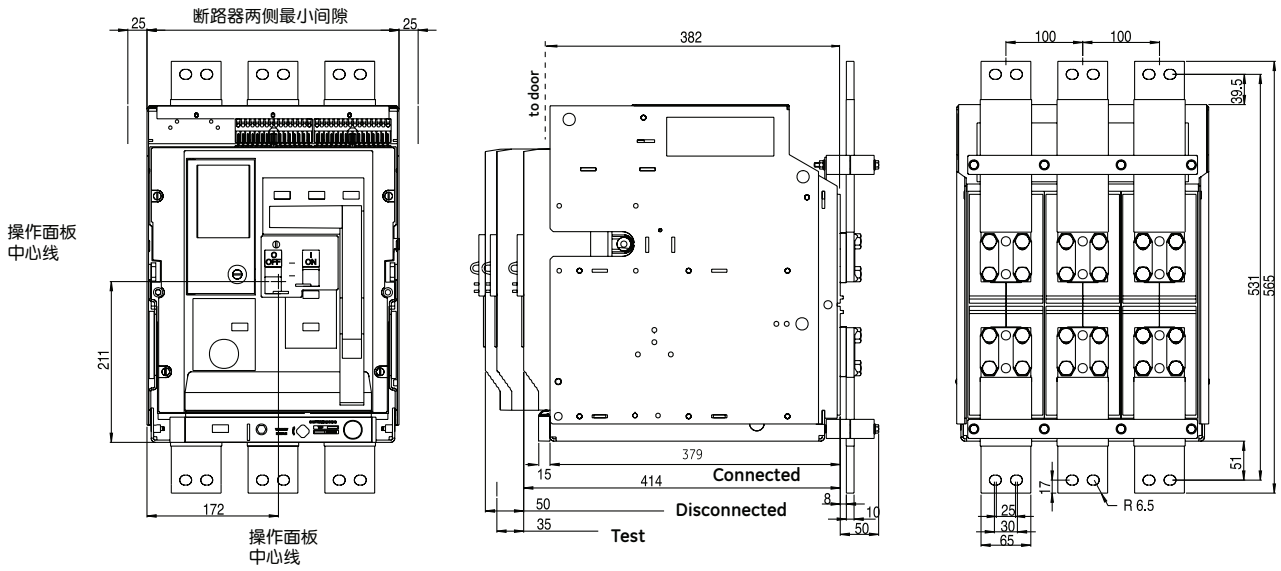
Type A, D - 4 pole - Frame size 2, In = 3200A to 4000A
Type H - 4 pole - Frame size 2, In = 800A to 4000A



Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

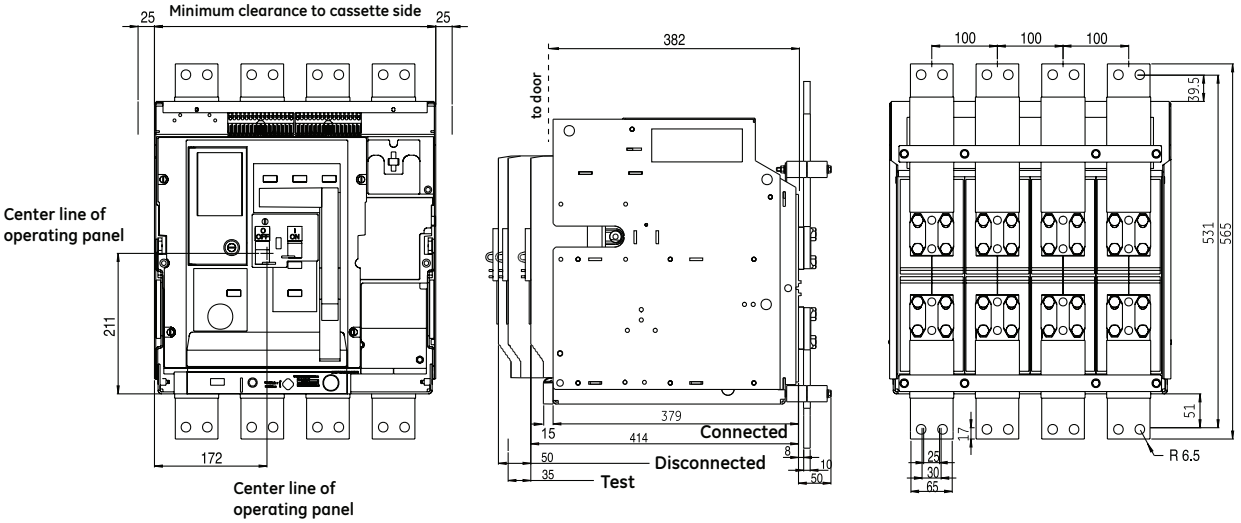
Front access connection
Withdrawable pattern

Type A, D - 3 pole - Frame size 1, In = 400A to 1600A



Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

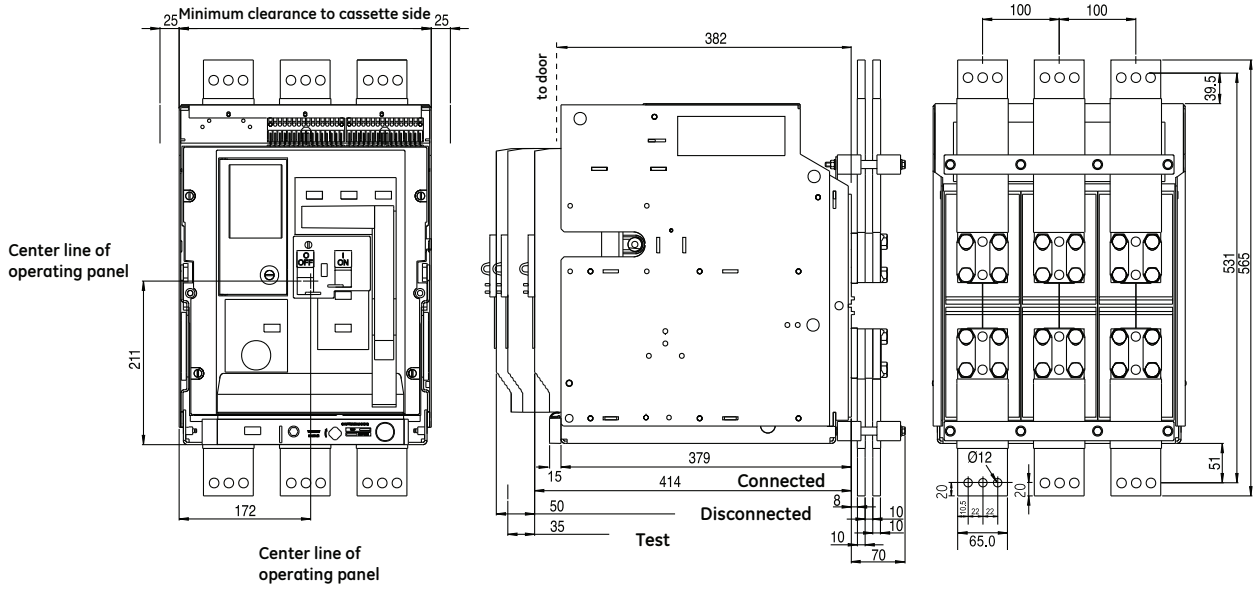
Type A, D - 4 pole - Frame size 1, In = 400A to 1600A



Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

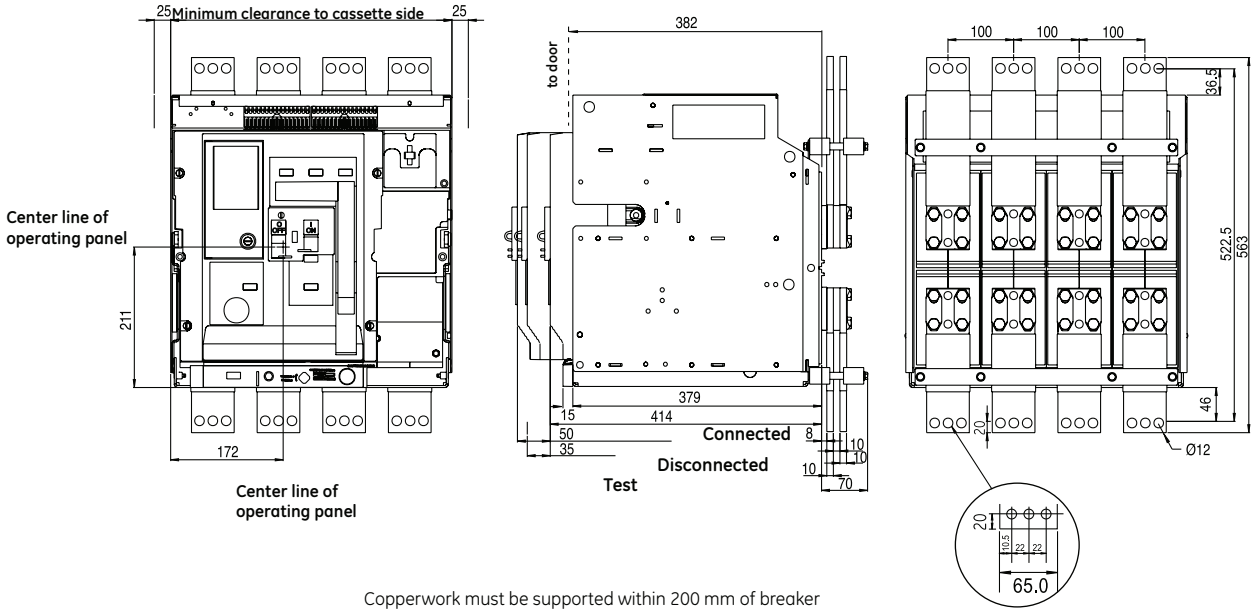
Front access connection
Withdrawable pattern

Type A, D - 3 pole - Frame size 1, In = 2000A to 2500A



Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

Type A, D - 4 pole - Frame size 1, In = 2000A to 2500A

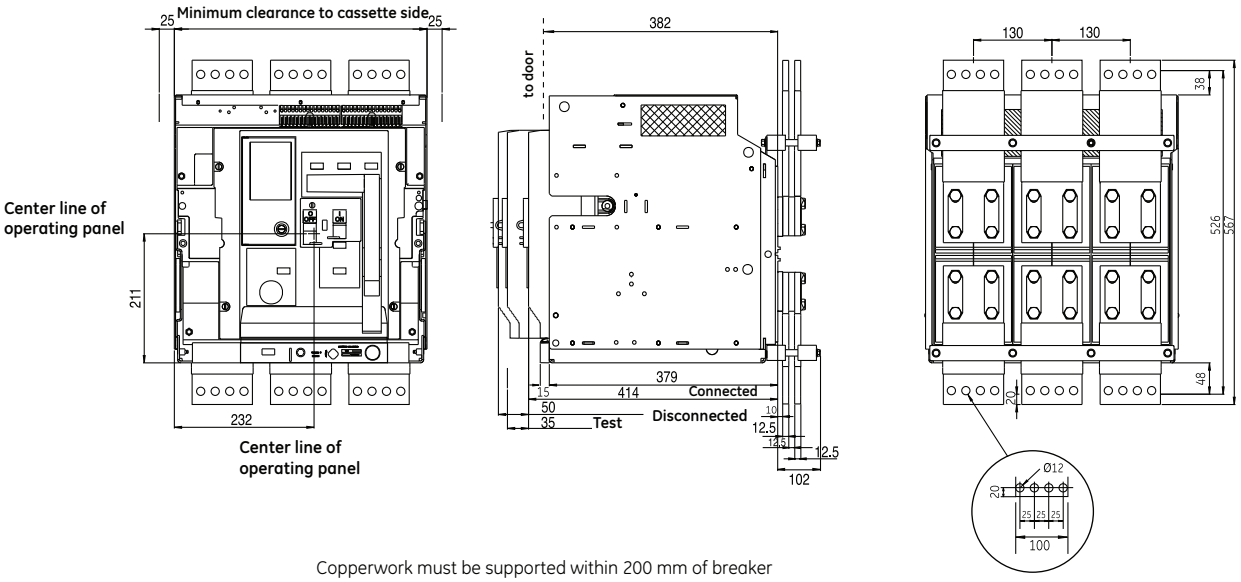


Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

Front access connection

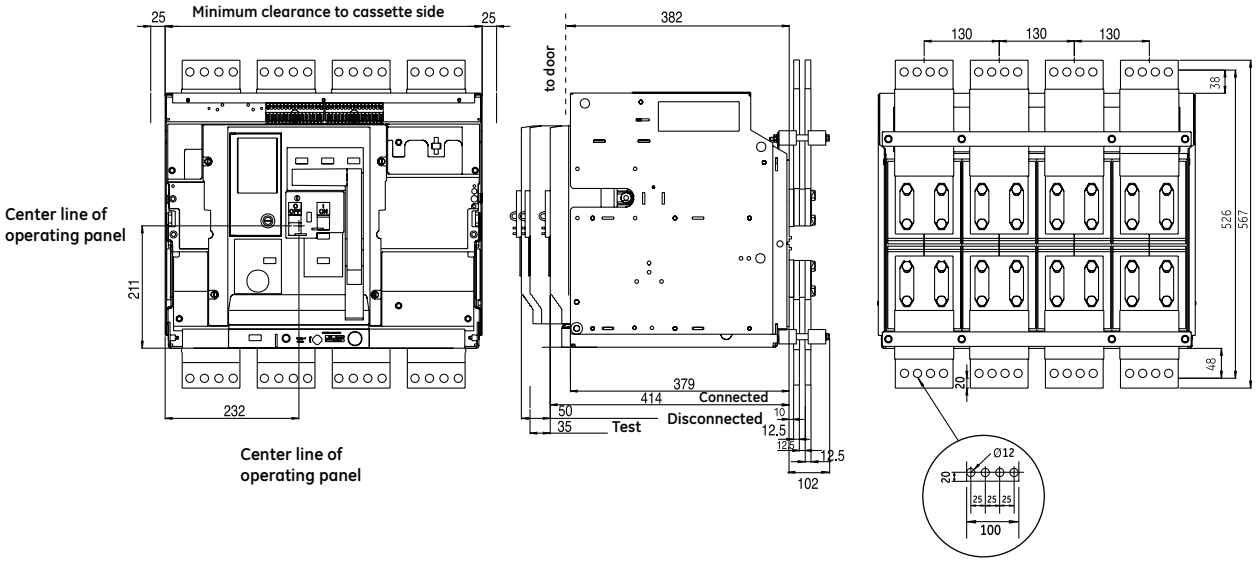
Fixed pattern

Type A, D - 3 pole - Frame size 2, In = 3200A to 4000A
Type H - 3 pole - Frame size 2, In = 800A to 4000A



Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

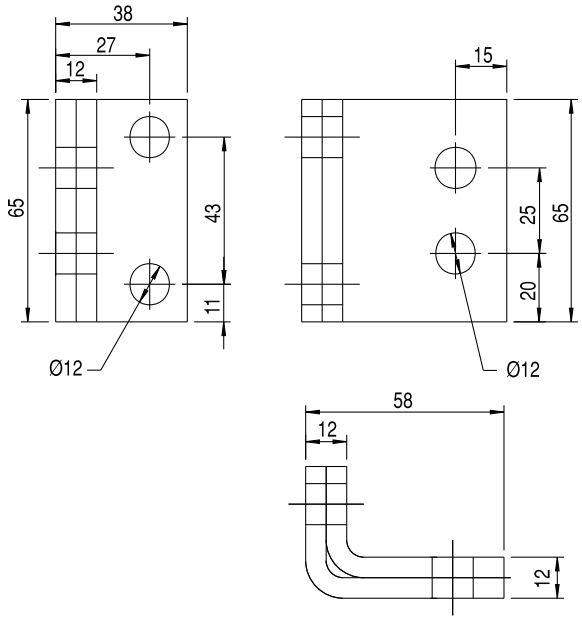
Type A, D - 4 pole - Frame size 2, In = 3200A to 4000A
Type H - 4 pole - Frame size 2, In = 800A to 4000A



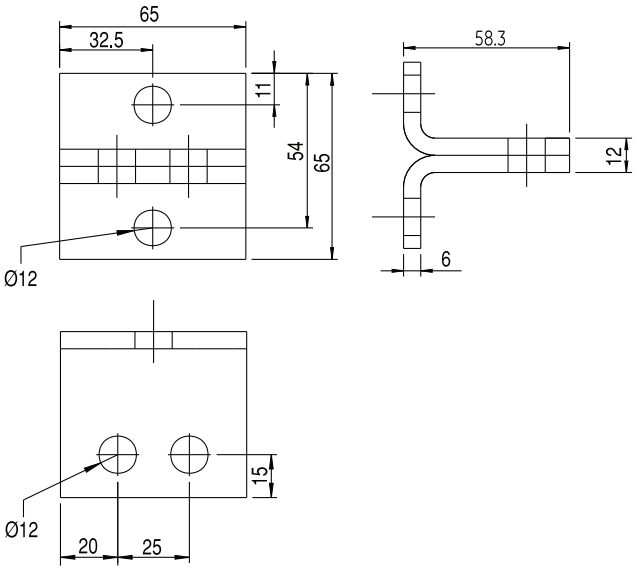
Copperwork must be supported within 200 mm of breaker connections-busbars or cables. All connections to be tightened to 50Nm.

Adaptor connections

Rear Adapter Vertical Connection
Type A - Frame 1 - In = 400A to 1600A (max)

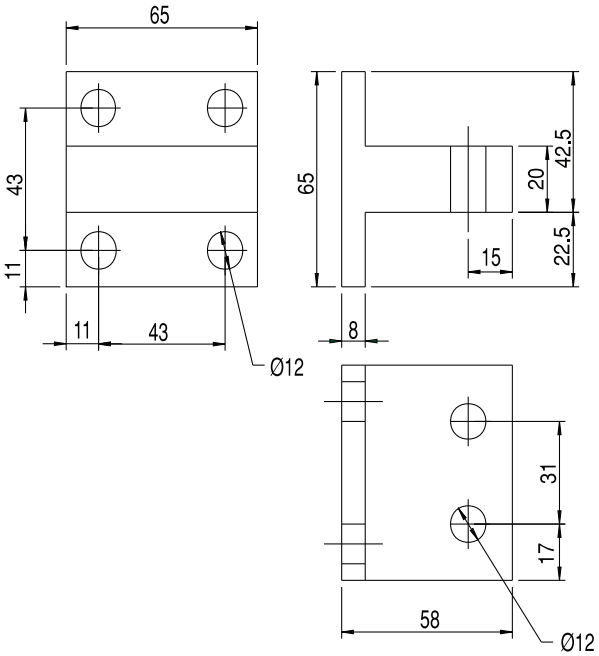


Rear Adapter Horizontal Connection
Type A - Frame 1 - In = 400A to 1600A (max)

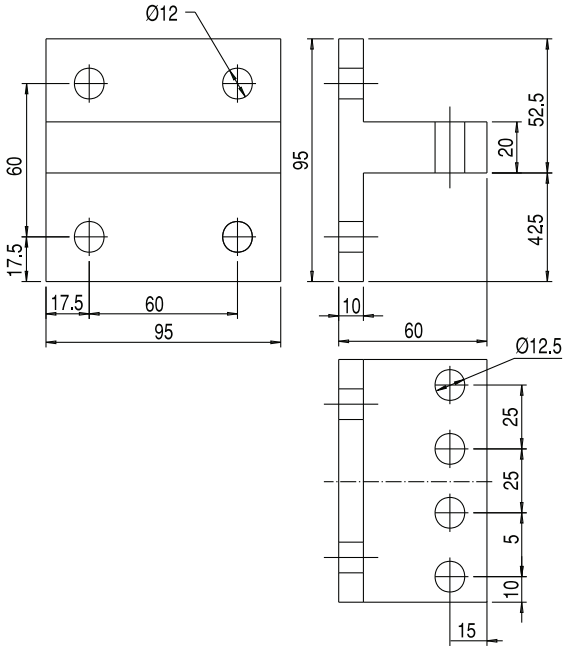


Rear Adapter Vertical / Horizontal Connection

Type D - Frame 1 - In = 400A to 2500A (max)

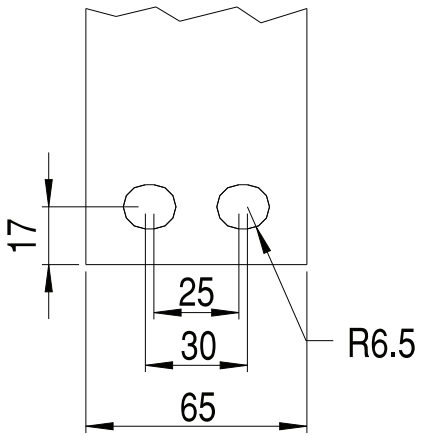


Type A,D,H - Frame 2 - In = 800A to3200A (max)

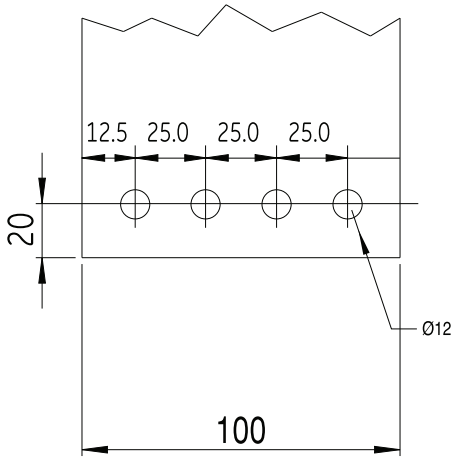


Copper connections - Front access (Fixed and/or withdrawable)

Type A - Frame 1 - In = 400A to 2500A (max)
Type D - Frame 1 - In = 400A to 2500A (max)

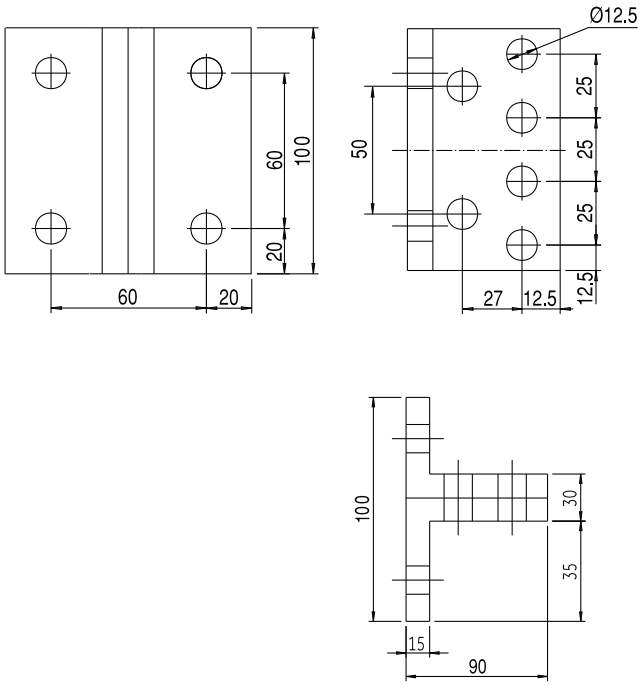


Type A,D - Frame 2 - In = 3200A to 4000A (max)
Type H - Frame 2 - In = 800A to 4000A (max)

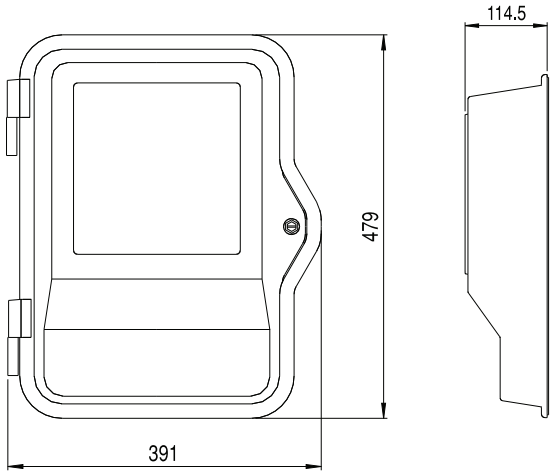


Copper connections - Rear access (withdrawable)

Type A,D,H - Frame 2 - In = 4000A

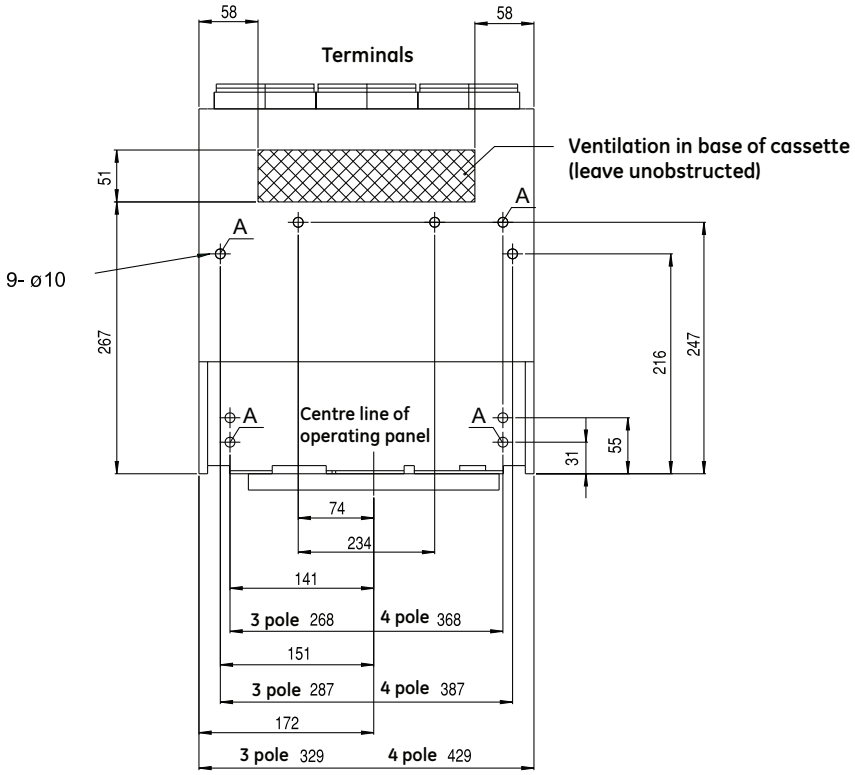


IP54 Door (Withdrawable unit only - Frame 1&2 only)

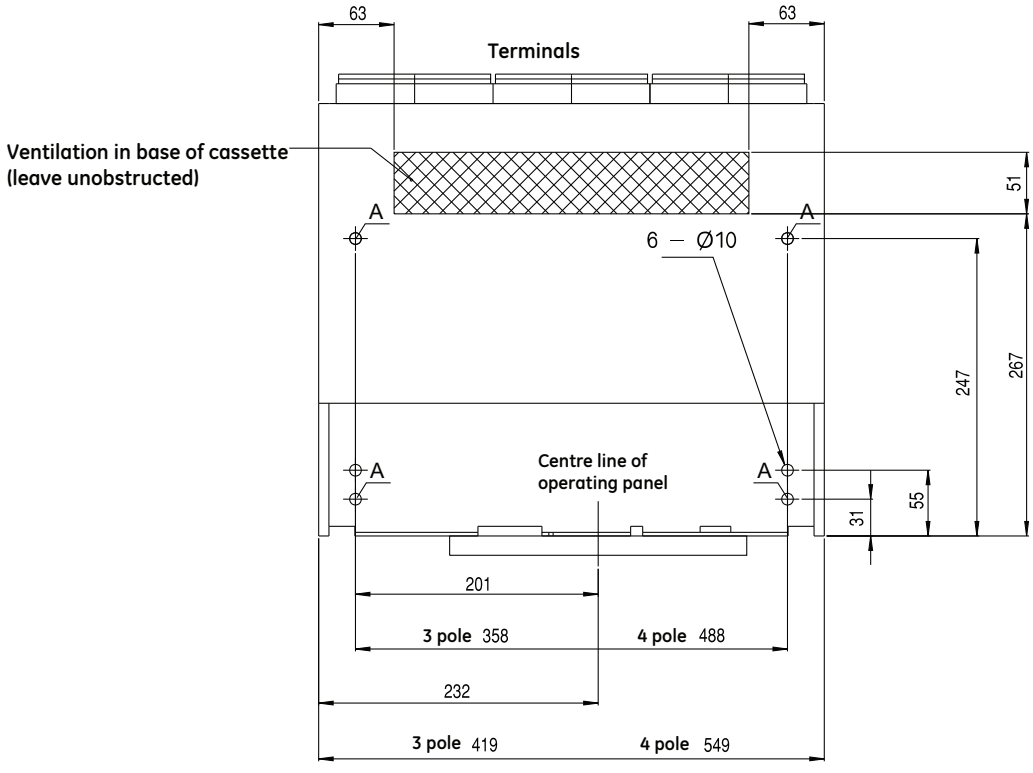


Cassette mounting details

Type A,D - Frame 1 - In = 400A to 2500A (max)



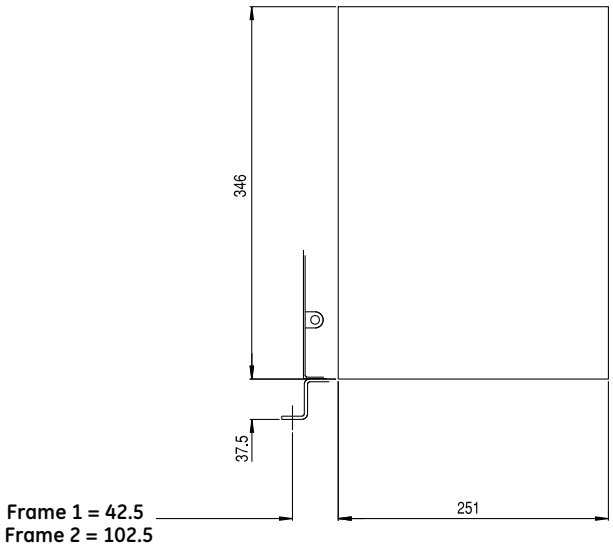
Type A,D - Frame 2 - In = 3200A to 4000A (max)
Type H - Frame 2 - In = 800A to 4000A (max)



A. recommend installtion mounting cut

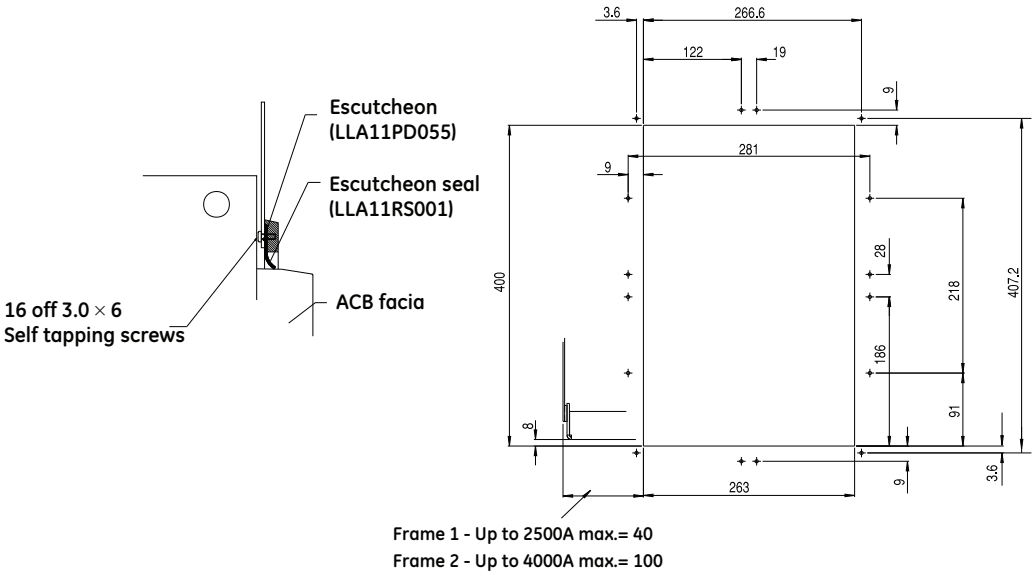
Door cut-outs

Fixed pattern - Facia cut-out



The cut-out dimensions shown above give an approximate nominal clearance of 30mm around ACB fascia. These sizes are for guidance and can be scaled if different aperture is required.

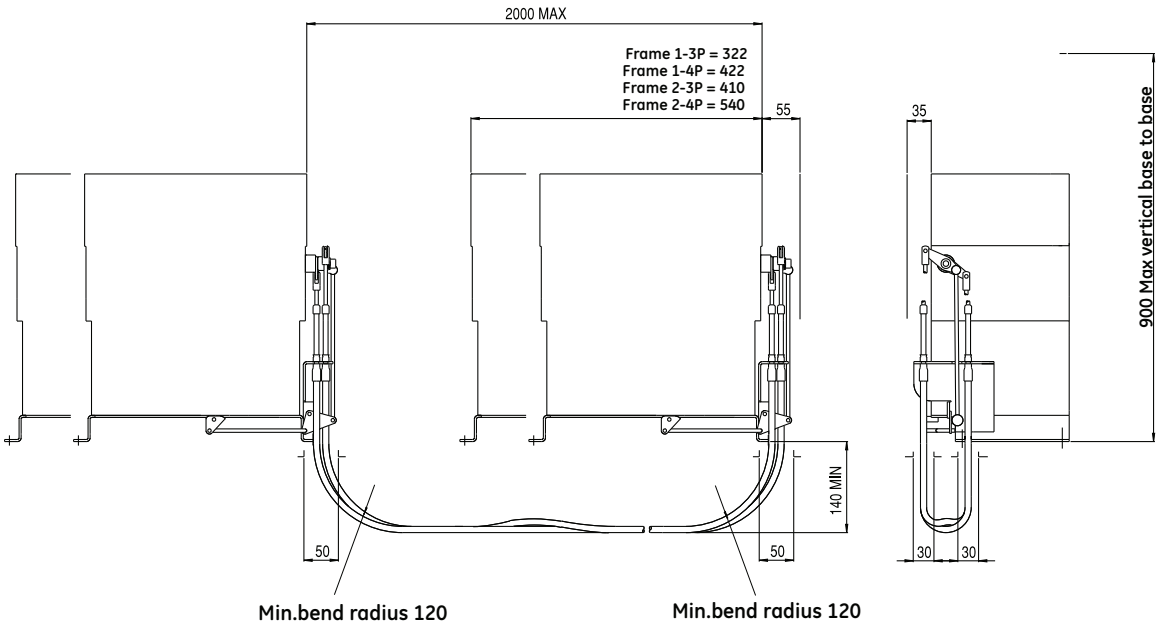
Withdrawable pattern - Cubicle door/panel



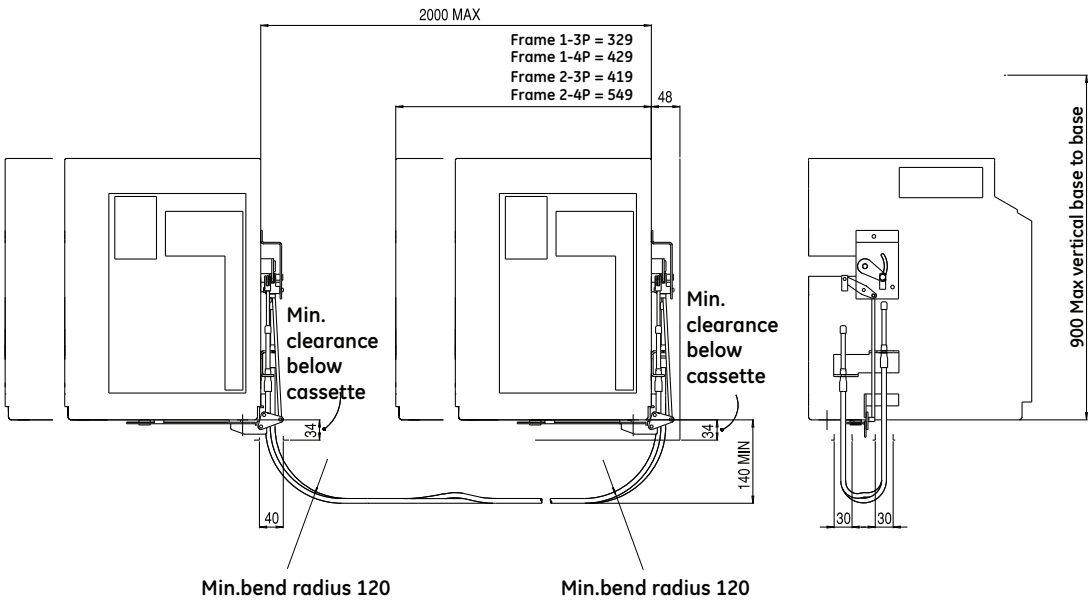
Datum for 16 off ∅4 holes in door / panel
- bottom left hand comer of cassette
viewed from front.

2-Way cable interlocking

Fixed pattern - Front/rear access



Withdrawable pattern - Front/rear access



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