

Low voltage

Masterpact NT and NW

UL 489 Listed
LV power circuit breakers
and automatic switches

Catalogue
2009



Schneider
Electric





The original Masterpact has set a new standard for power circuit breakers around the world



The reliability offered by a major brand

Schneider Electric has forged a solid reputation in terms of quality and innovation, continuously integrating the latest technology in all its circuit breakers. Reliability, flexibility and simplicity have always been the top priority. Schneider Electric offers the widest range of products available on the market with frame sizes, accessories and performance characteristics meeting the requirements of all types of applications.



UL 489 Listing

UL 489 Listed products have been tested to ensure they meet a number of criteria related to specific properties, hazards and conditions of use.

UL Listing represents the most widely accepted certification by consumers, regulatory organisations and industry in the United States and Canada.

UL 489 Listed Masterpact



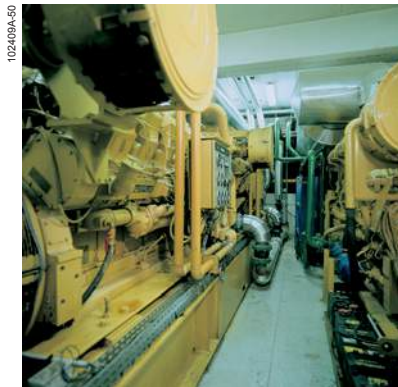
Three performance levels

N : for standard applications.

H : for heavy industry with high short-circuit levels.

L1 : for current-limiting capability.

Intended to raise the performance level of a switchboard when the transformer power rating is increased.



Integration in a communications network

Masterpact can be integrated in a general supervision system to optimise installation operation and maintenance. The communication architecture is open and may be upgraded for interfacing with any protocol.

Automatic switch versions (HF)

The automatic switches are derived directly from the circuit breakers and offer the same features and performance levels.

The HF version includes instantaneous protection to prevent closing on a short-circuit. When closed, the device is protected by an instantaneous override release.

3 frame sizes, 2 families



The range of power Masterpact circuit breakers includes two families:

- > Masterpact NT, the world's smallest true power circuit breaker, with ratings of 800 and 1200 A
- > Masterpact NW, in two frame sizes, one for 800 to 3000 A and the other for 4000 and 5000 A ratings.

Masterpact NT 800 and 1200 A



L1	65 kA	NT 08	NT 12				
N	50 kA	NT 08	NT 12				

Masterpact NW 800 to 3000 A



H	100 kA	NW 08	NW 12	NW 16	NW 20	NW 25	NW 30
N	65 kA	NW 08	NW 12	NW 16	NW 20	NW 25	NW 30

4000 and 5000 A



H	100 kA	NW 40	NW 50				
N							

Optimised volumes



PB101942A3D_SE



The smallest circuit breaker in the world

Masterpact NT innovates by offering all the performance of a power circuit breaker in an extremely small volume. The 70 mm pole pitch means a three-pole drawout circuit breaker can be installed in a switchboard section 400 mm wide and 400 mm deep.

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Practical installation solutions

The Masterpact NW range further improves the installation solutions that have built the success of its predecessors. It has been designed to standardise switchboards, optimise volumes and simplify installation:

- > incoming connection to top or bottom terminals
- > no safety clearance required
- > connection:
 - horizontal or vertical rear connection
 - front connection with minimum extra space (NT only)
 - mixed front and rear connections
- > 115 mm pole pitch on all versions.

Optimised volumes

Up to 3000 A, Masterpact NW circuit breakers are all the same size, the same as the old M08 to 32 range.

Ease of installation

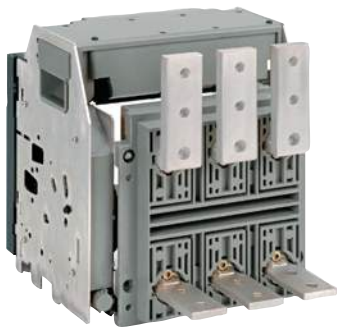


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Vertical and horizontal rear connection of a fixed Masterpact NW.

PB101572A45_SE



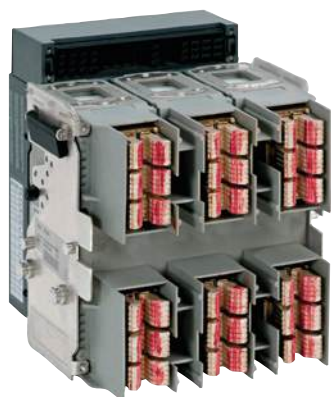
Horizontal rear and front connection of a drawout Masterpact NT.

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Clusters fixed on a Masterpact NW device.

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Clusters fixed on a Masterpact NT device.

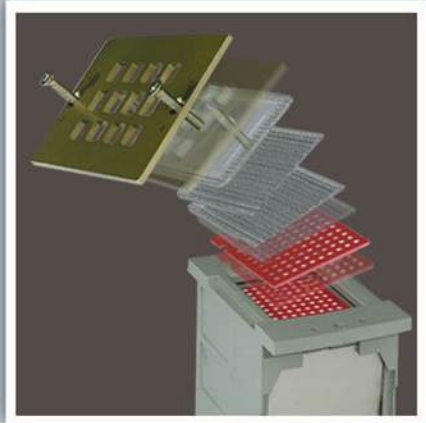
With optimised sizes, the Masterpact NT and NW ranges simplify the design of switchboards and standardise the installation of devices:

- > a single connection layout for Masterpact NT
- > three connection layouts for Masterpact NW:
 - one from 800 to 3000 A
 - one for 4000 A
 - one for 5000 A
- > identical connection terminals from 800 to 5000 A (Masterpact NW)
- > front connection in minimum space
- > rear connection to vertical or horizontal busbars simply by turning the connectors 90 °.
- > disconnecting contact clusters fixed on the device.

Innovation



PB100740A-64



Filtered breaking.

Greater dependability... Filtered breaking



The patented design of the arc chutes includes stainless-steel filters. The chutes absorb the energy released during breaking, thus limiting the stresses exerted on the installation. They filter and cool the gases produced, reducing effects perceptible from the outside.

More intelligent trip units...

Today, with the high speed of calculation, the small size of memories and advances in miniaturisation, trip units have become circuit breaker control units offering increasingly powerful functions. They accurately measure system parameters, instantly calculate values, store data, log events, signal alarms, communicate, take action, etc. The Masterpact ranges, equipped with Micrologic control units, constitute both an extremely reliable protective device and an accurate measurement instrument.

PB100739A-64



Navigation buttons on a Micrologic P control unit.

User friendly... Intuitive use...

Micrologic control units are equipped with a digital LCD display used in conjunction with simple navigation buttons. Users can directly access parameters and settings. Navigation between screens is intuitive and the immediate display of values greatly simplifies settings. Text is displayed in the desired language.

... backed by incomparable security



Protection functions are separate from the measurement functions and are managed by an ASIC electronic component. This independence guarantees immunity from conducted or radiated disturbances and ensures a high degree of reliability.

A patented "double setting" system for protection functions establishes:

- > a maximum threshold set using the control-unit dials
- > fine adjustments via the keypad or remotely. The fine adjustments for thresholds (to within one ampere) and tripping delays (to within a fraction of a second) are displayed directly on the screen.

The control unit cover can be lead-sealed to prevent uncontrolled access to the dials and protect the settings.

Designed for the future



Compliance with environmental requirements

Schneider Electric fully takes into account environmental requirements, starting right from the design phase of every product through to the end of its service life:

- > the materials used for Masterpact are not potentially dangerous to the environment
- > the production facilities are non-polluting in compliance with the ISO 14001 standard
- > filtered breaking eliminates pollution in the switchboard
- > the energy dissipated per pole is low, making energy losses insignificant
- > the materials are marked to facilitate sorting for recycling at the end of product service life.

Integration in a communication network

Masterpact can be integrated in a general supervision system to optimise installation operation and maintenance. The communication architecture is open, and may be upgraded for interfacing with any protocol.

Simple extension and upgrading of installations

Installations evolve, power levels increase and new equipment is required. Masterpact is designed to adapt to these changes:

- > all control units are interchangeable
- > communication with a supervision system is an option that may be added at any time
- > a reserve chassis can be pre-addressed so that system parameters do not have to be modified when a drawout device is installed at a later date
- > any future changes to the products will be designed to ensure continuity with the current ranges, thus simplifying installation extensions and upgrades.



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schneider-electric.com

This international site allows you to access all the Schneider Electric products in just 2 clicks via comprehensive range data-sheets, with direct links to:

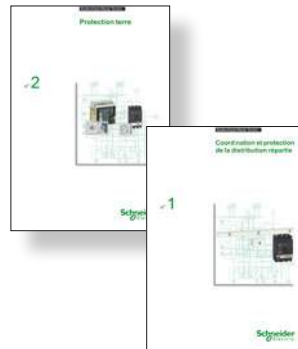
- complete library: technical documents, catalogs, FAQs, brochures...
- selection guides from the e-catalog.
- product discovery sites and their Flash animations.

You will also find illustrated overviews, news to which you can subscribe, the list of country contacts...



The technical guide

These technical guides help you comply with installation standards and rules i.e.: the electrical installation guide, the protection guide, the switchboard implementation guide, the technical booklets and the co-ordination tables all form genuine reference tools for the design of high performance electrical installations. For example, the LV protection co-ordination guide - discrimination and cascading - optimises choice of protection and connection devices while also increasing markedly continuity of supply in the installations.





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This chapter describes all the functions offered by Masterpact NT and NW devices. The two product families have identical functions implemented using the same or different components depending on the case.

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Circuit breakers and automatic switches page A-4

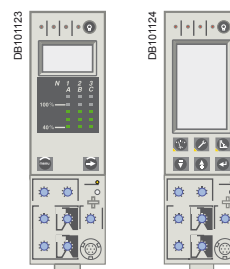
- Ratings:
 - Masterpact NT 800 and 1200 A
 - Masterpact NW 800 to 5000 A
- Circuit breakers type N, H, L1
- Automatic switches type HF
- 3 or 4 poles
- Fixed or drawout versions
- option with neutral on the right (NW only).

Micrologic control units page A-10

- Ammeter A**
- 3.0 A basic protection
 - 5.0 A selective protection
 - 6.0 A selective + ground-fault protection

- Power meter P**
- 5.0 P selective protection
 - 6.0 P selective + ground-fault protection

- Harmonic meter H**
- 5.0 H selective protection
 - 6.0 H selective + ground-fault protection
 - External sensor for ground-fault protection
 - Setting options (long-time rating plug)
 - External power-supply module
 - Battery module.

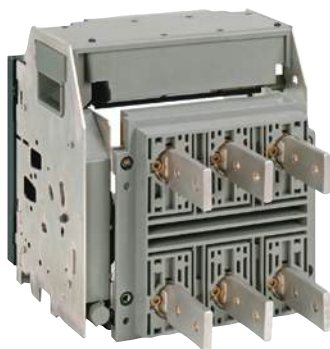


Portable data acquisition page A-22

- Masterpact and GetnSet



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Communication page A-24

- COM option in Masterpact
- Masterpact in a communication network
- Masterpact and the Micro Power Server MPS100.

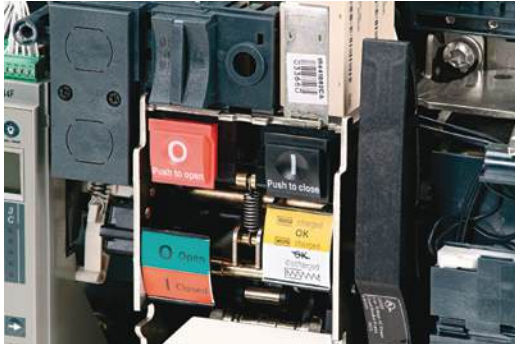
Connections page A-30

- Horizontal or vertical rear connections
- Front connections (NT only)
- Mixed connections
- Safety shutters
- Optional accessories:
 - bare-cable connectors and connector shields
 - terminal shields.



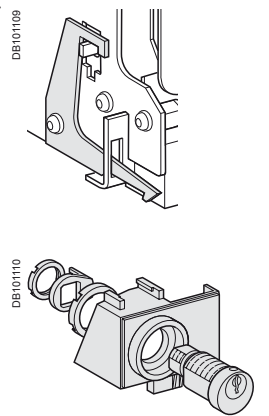


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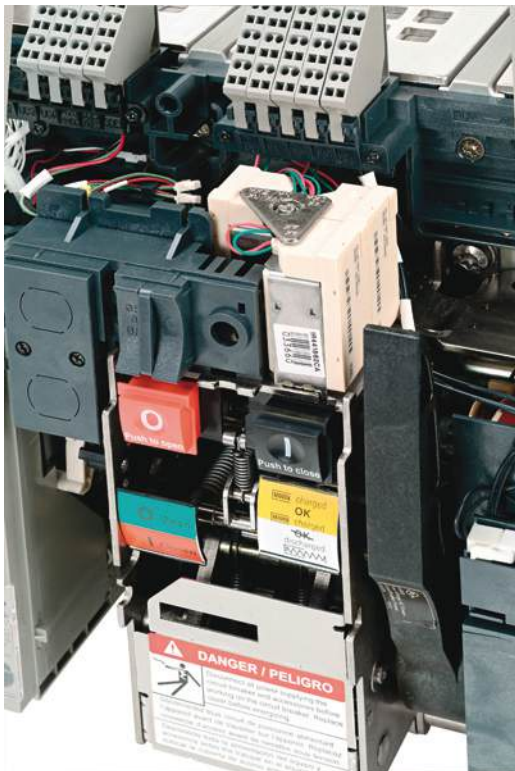


Locking page A-32

- Pushbutton locking by padlockable transparent cover
- OFF-position locking by padlock or keylock
- Chassis locking in disconnected position by keylock
- Chassis locking in connected, disconnected and test positions
- Door interlock (inhibits door opening with breaker in connected position)
- Racking interlock (inhibits racking with door open)
- Racking interlock between crank and OFF pushbutton
- Automatic spring discharge before breaker removal
- Mismatch protection.

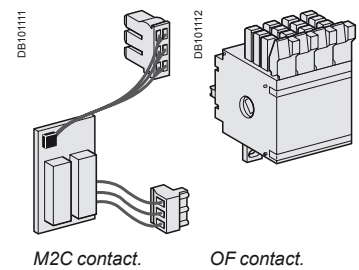


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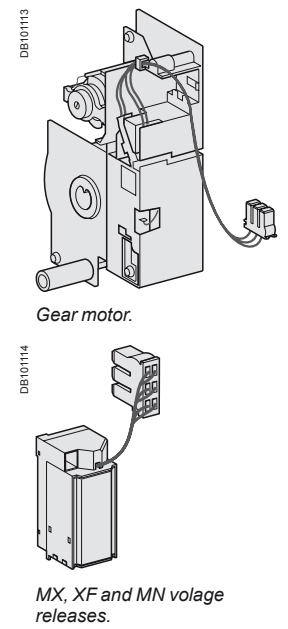
Indication contacts page A-34

- Standard or low-level contacts:
 - ON/OFF indication (OF)
 - "fault trip" indication (SDE)
 - carriage switches for connected (CE) disconnected (CD) and test (CT) positions
- Programmable contacts:
 - 2 contacts (M2C)
 - 6 contacts (M6C).



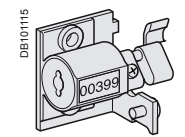
Remote operation page A-36

- Remote ON/OFF:
 - gear motor
 - XF closing or MX opening voltage releases
 - PF ready-to-close contact
 - options:
 - Res electrical remote reset
 - BPFE electrical closing pushbutton
- Remote tripping function:
 - MN voltage release:
 - standard
 - adjustable or non-adjustable delay
 - or second MX voltage release.



Accessories page A-38

- Auxiliary terminal shield
- Operation counter
- Escutcheon
- Transparent cover for escutcheon
- Escutcheon blanking plate.





Circuit breakers and automatic switches

Masterpact NT08 and NT12 selection and installation

Masterpact NT selection criteria

	Masterpact NT	
	Standard applications NT08 and NT12	
	N	L1
Type of application	Standard applications with low short-circuit currents	Limiting circuit breaker for protection of cable-type feeders or upgraded transformer ratings
Interrupting current (kA rms) at 480 V AC	50 kA	65 kA
Position of neutral	Left	Left
Fixed	F	F
Drawout	D	D
Automatic switch version	Yes	No
Front connection	Yes	Yes
Rear connection	Yes	Yes
Type of Micrologic control unit	A, P, H	A, P, H

Masterpact NT08 to NT12 installation characteristics

Circuit breaker		NT08/NT12		
Type		N	L1	HF
Connection				
Drawout	FC	■	■	■
	RC	■	■	■
Fixed	FC	■	■	■
	RC	■	■	■
Dimensions (mm) H x W x D				
Drawout	3P	322 x 288 x 277	322 x 288 x 277	322 x 288 x 277
	4P	322 x 358 x 277	-	322 x 358 x 277
Fixed	3P	301 x 276 x 196	301 x 276 x 196	301 x 276 x 196
	4P	301 x 346 x 196	-	301 x 346 x 196
Weight (kg) (approximate)				
Drawout	3P/4P	30/39	30	30/39
Fixed	3P/4P	14/18	14	14/18



Masterpact NW08 to NW50 selection and installation

Masterpact NW selection criteria

	Masterpact NW	
	Standard applications	
	NW08-NW20 N	NW08-NW50 H
Type of application	Standard applications with medium-level short-circuit currents	High-performance circuit breaker for heavy industry with high short-circuit currents
Interrupting current (kA rms) at 480 V AC	65 kA	100 kA
Position of neutral	Left or right	Left or right
Fixed	F	F
Drawout	D	D
Automatic switch version	No	Yes
Front connection	No	No
Rear connection	Yes	Yes
Type of Micrologic control unit	A, P, H	A, P, H

Masterpact NW08 to NW50 installation characteristics

Disjoncteurs		NW08/NW12/NW16/NW20	NW25/NW30	NW40/NW50
Type		N/H/HF	H/HF	H/HF
Connection				
Drawout	FC	-	-	-
	RC	■	■	■
Fixed	FC	-	-	-
	RC	■	■	■
Dimensions (mm) H x W x D				
Drawout	3P	439 x 441 x 395		479 x 786 x 395
	4P	439 x 556 x 395		479 x 1016 x 395
Fixed	3P	352 x 442 x 297		352 x 767 x 297
	4P	352 x 537 x 297		352 x 997 x 297
Weight (kg) (approximate)				
Drawout	3P/4P	90/120		225/300
Fixed	3P/4P	60/80		120/160



Circuit breaker and automatic switch characteristics

Masterpact NT08 and NT12

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UL 489 Listed circuit breaker characteristics

Rating (A)	
Type of circuit breaker	
Interrupting current (kA rms)	240 V AC, 50/60 Hz
	480 V AC, 50/60 Hz
	600 V AC, 50/60 Hz
Number of poles	
Rated short-time withstand current (kA rms)	0.5 s
Integrated instantaneous protection (kA rms $\pm 10\%$)	
Close and latch rating (kA rms) V AC 50/60 Hz	
Breaking time (ms)	
Closing time (ms)	

Sensor selection

Sensor rating (A)	
I _r threshold setting (A)	

UL 489 Listed automatic switch characteristics

Type of automatic switch	
Rated short-time withstand current (kA rms)	220 V AC, 50/60 Hz
	480 V AC, 50/60 Hz
	600 V AC, 50/60 Hz
Number of poles	
Integrated instantaneous protection (kA rms)	

Mechanical and electrical endurance

Endurance rating (C/O cycles x 1000)	mechanical	without maintenance
	electrical	without maintenance

Shipping weights

Number of poles	
Circuit breaker (lb/kg)	
Chassis (lb/kg)	
Connector (lb/kg)	FC
	RC
Pallet (lb/kg)	
Total weight (lb/kg)	
	FC
	RC



NT08		NT12	
800		1200	
N	L1	N	L1
50	100	50	100
50	65	50	65
35	-	35	-
3	3	3	3
35	10	35	10
40	10	40	10
25	10	25	10
25 to 30		25 to 30	
< 50		< 50	

NT08		NT12	
800		1200	
320 to 800		500 to 1200	

NT08		NT12	
HF		HF	
65		65	
50		50	
50		50	
3/4		3/4	
40		40	

NT08/NT12	
12.5	
2.8	

NT08/NT12	
3P	4P
40/18	52/24
36/16	43/20
15/7	20/9
6/3	8/4
10/5	10/5
101/46	125/57
92/42	113/51



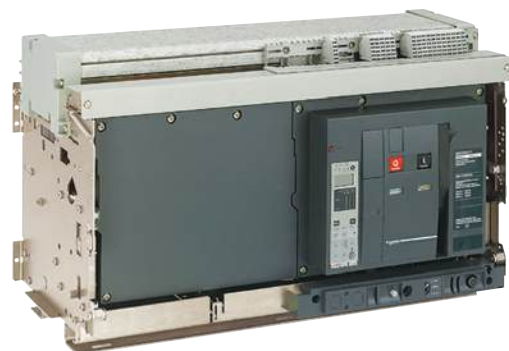
Circuit breaker and automatic switch characteristics

Masterpact NW08 to NW50

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DE110370-66A



UL 489 Listed circuit breaker characteristics

Rating (A)

Type of circuit breaker

Interrupting current (kA rms)	240 V AC 50/60 Hz
	480 V AC 50/60 Hz
	600 V AC 50/60 Hz

Number of poles

Rated short-time withstand current (kA rms) 1 s

Integrated instantaneous protection (kA rms $\pm 10\%$)

Close and latch rating (kA rms) V AC 50/60 Hz

Breaking time (ms)

Closing time (ms)

Sensor selection

Sensor rating (A)

I_r threshold setting (A)

UL 489 Listed automatic switch characteristics

Type of automatic switch

Rated short-time withstand current (kA rms)	240 V AC 50/60 Hz
	480 V AC 50/60 Hz
	600 V AC 50/60 Hz

Number of poles

Integrated instantaneous protection (kA rms)

Mechanical and electrical endurance

Endurance rating (C/O cycles x 1000)	mechanical	with maintenance
		without maintenance
	electrical	without maintenance

Shipping weights

Number of poles

Circuit breaker (lb/kg)

Chassis (lb/kg)

RC connector (lb/kg)

Pallet (lb/kg)

Total weight (lb/kg)



NW08	NW12	NW16	NW20	NW25	NW30	NW40	NW50
800	1200	1600	2000	2500	3000	4000	5000
N	H			H		H	
65	100			100		100	
65	100			100		100	
50	85			85		85	
3/4	3/4			3/4		3/4	
42	65			65		85	
40	40			65		75	
40	40			40		40	
25 to 30	25 to 30			25 to 30		25 to 30	
< 70	< 70			< 70		< 70	

NW08	NW12	NW16	NW20	NW25	NW30	NW40	NW50
800	1200	1600	2000	2500	3000	4000	5000
320 to 800	500 to 1200	630 to 1600	800 to 2000	1000 to 2500	1250 to 3000	1600 to 4000	2000 to 5000

NW08/NW12/NW16/NW20				NW25/NW30		NW40/NW50	
HF				HF		HF	
100				100		100	
100				100		100	
85				85		85	
3/4				3/4		3/4	
40				65		75	

NW08/NW12/NW16			NW20	NW25/NW30		NW40/NW50	
25			20	20		10	
12.5			12.5	10		5	
2.8			2.8	1		1	

NW08/NW12/NW16/NW20				NW25/NW30		NW40/NW50	
3P		4P		3P	4P	3P	4P
109/50		142/65		127/58	165/75	227/103	295/134
97/44		116/53		124/57	149/68	278/126	334/152
17/8		22/10		26/12	34/15	52/24	68/31
17/8		17/8		17/8	17/8	39/18	39/18
240/109		288/130		294/134	356/161	596/271	736/333



All Masterpact circuit breakers are equipped with a Micrologic control unit that can be changed on site. Control units are designed to protect power circuits and loads. Alarms may be programmed for remote indications. Measurements of current, voltage, frequency, power and power quality optimise continuity of service and energy management.

Dependability

Integration of protection functions in an ASIC electronic component used in all Micrologic control units guarantees a high degree of reliability and immunity to conducted or radiated disturbances.

On Micrologic A, P and H control units, advanced functions are managed by an independent microprocessor.

Accessories

Certain functions require the Micrologic control unit to be combined with accessories. They are described on [page A-20](#).

The rules governing such combinations can be found on the “www.schneider-electric.com” web site in the “E-catalog” part of the “Products” menu.

Micrologic name codes

3.0 A
X Y Z

X: type of protection

- 3 for basic protection
- 5 for selective protection
- 6 for selective + ground-fault protection.

Y: control-unit generation

Identification of the control-unit generation. “0” signifies the first generation.

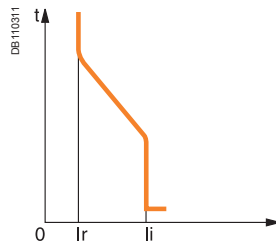
Z: type of measurement

- A for “ammeter”
- P for “power meter”
- H for “harmonic meter”.



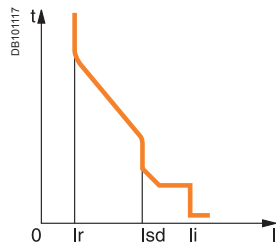
Current protection

Micrologic 3: basic protection



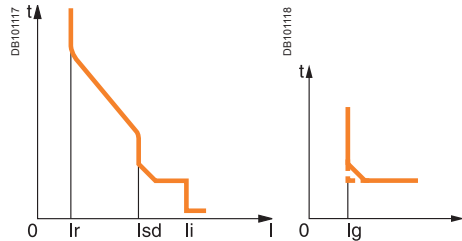
Protection:
long time
+ instantaneous

Micrologic 5: basic protection



Protection:
long time
+ short time
+ instantaneous

Micrologic 6: selective + ground-fault protection



Protection:
long time
+ short time
+ instantaneous
+ ground-fault



Measurements and programmable protection

A: ammeter

- $I_1, I_2, I_3, I_N, I_{\text{ground-fault}}$ and maximeter for these measurements
- Fault indications
- Settings in amperes and in seconds.

P: A + power meter + programmable protection

- Measurements of V, A, W, VAR, VA, Wh, VARh, VAh, Hz, $V_{\text{peak}}, A_{\text{peak}}$, power factor and maximeters and minimeters
- IDMTL long-time protection, minimum and maximum voltage and frequency, voltage and current imbalance, phase sequence, reverse power
- Load shedding and reconnection depending on power or current
- Measurements of interrupted currents, differentiated fault indications, maintenance indications, event histories and time-stamping, etc.

H: P + harmonics

- Power quality: fundamentals, distortion, amplitude and phase of harmonics up to the 31st order
- Waveform capture after fault, alarm or on request
- Enhanced alarm programming: thresholds and actions.

3.0 A



5.0 A



5.0 P



5.0 H



6.0 A



6.0 P

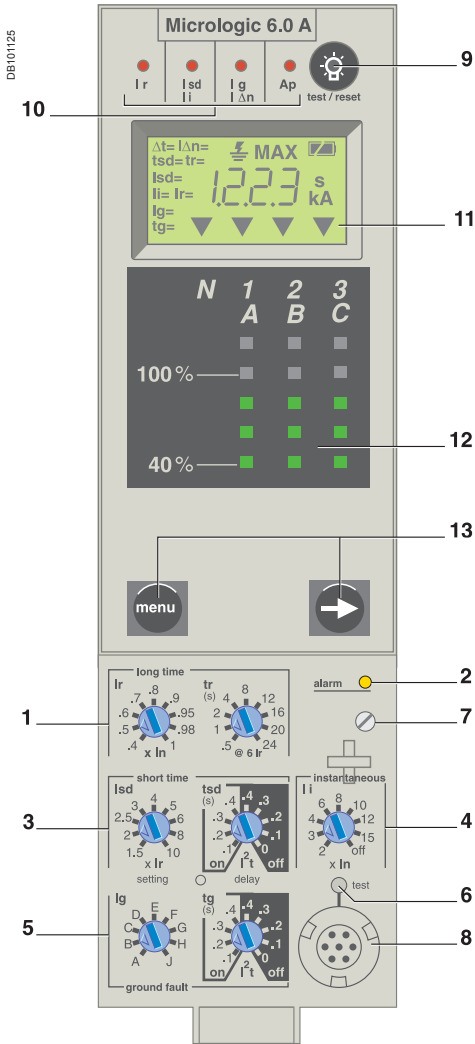


6.0 H





Micrologic A control units protect power circuits. They also offer measurements, display, communication and current maximeters. Version 6 provides ground-fault protection.



- 1 Long-time current setting and tripping delay.
- 2 Overload signal (LED) at 1.125 Ir.
- 3 Short-time pick-up and tripping delay.
- 4 Instantaneous pick-up.
- 5 Ground-fault pick-up and tripping delay.
- 6 Ground-fault test button.
- 7 Long-time rating plug screw.
- 8 Test connector.
- 9 Lamp test, reset and battery test.
- 10 Indication of tripping cause.
- 11 Digital display.
- 12 Three-phase bargraph and ammeter.
- 13 Navigation buttons.

Protection settings

Protection thresholds and delays are set using the adjustment dials. The selected values are momentarily displayed in amperes and in seconds.

Overload protection

True rms long-time protection.
Thermal memory: thermal image before and after tripping.
Setting accuracy may be enhanced by limiting the setting range using a different long-time rating plug.
The long-time rating plug “OFF” enables to cancel the overload protection.

Short-circuit protection

Short-time (rms) and instantaneous protection.
Selection of I²t type (ON or OFF) for short-time delay.

Ground-fault protection

Residual or source ground return.
Selection of I²t type (ON or OFF) for delay.

Neutral protection

On three-pole circuit breakers, neutral protection is not possible.
On four-pole circuit breakers, neutral protection may be set using a three-position switch: neutral unprotected (4P 3d), neutral protection at 0.5 Ir (4P 3d + N/2), neutral protection at Ir (4P 4d).

Zone selective interlocking (ZSI)

A ZSI terminal block may be used to interconnect a number of control units to provide total discrimination for short-time and ground-fault protection, without a delay before tripping.

“Ammeter” measurements

Micrologic A control units measure the true rms value of currents. They provide continuous current measurements from 0.2 to 20 In and are accurate to within 1.5 % (including the sensors).
A digital LCD screen continuously displays the most heavily loaded phase (Imax) or displays the I₁, I₂, I₃, I_N, I_g, stored-current (maximeter) and setting values by successively pressing the navigation button.
The optional external power supply makes it possible to display currents < 20 % In. Below 0.05 In, measurements are not significant. Between 0.05 and 0.2 In, accuracy is to within 0.5 % In + 1.5 % of the reading.

Communication option

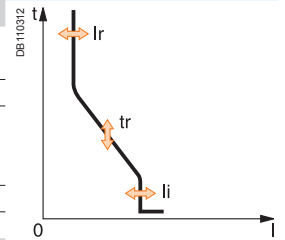
In conjunction with the COM communication option, the control unit transmits the following:

- setting values
- all “ammeter” measurements
- tripping causes
- maximeter reset.

Note: Micrologic A control units come with a transparent lead-seal cover as standard.



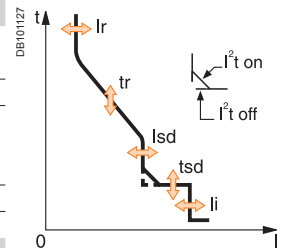
Protection		Micrologic 3.0 A									
Long time											
Current setting (A)	$I_r = I_n \times \dots$	3.0 A:	0.4	0.45	0.5	0.6	0.63	0.7	0.8	0.9	1
Tripping between 1.05 and 1.20 x I_r		Other ranges or disable by changing long-time rating plug									
Time setting		tr (s)	0.5	1	2	4	8	12	16	20	24
Time delay (s)	Accuracy: 0 to -30 %	1.5 x I_r	12.5	25	50	100	200	300	400	500	600
	Accuracy: 0 to -20 %	6 x I_r	0.7 ⁽¹⁾	1	2	4	8	12	16	20	24
	Accuracy: 0 to -20 %	7.2 x I_r	0.7 ⁽²⁾	0.69	1.38	2.7	5.5	8.3	11	13.8	16.6
Thermal memory		20 minutes before and after tripping									
(1) 0 to -40 % - (2) 0 to -60 %											
Instantaneous											
Pick-up (A)	$I_i = I_n \times \dots$	3.0 A:	1.5	2	3	4	5	6	8	10	12
Accuracy: ± 10 %											
Time delay		Max resettable time: 20 ms Max break time: 80 ms									



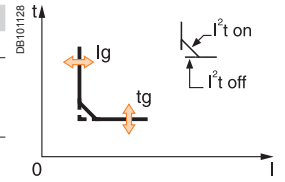
Ammeter		Micrologic 3.0 A				
Continuous current measurements						
Display from 20 to 200 % of I_n		I1	I2	I3	IN	
Accuracy: 1.5 % (including sensors)		No auxiliary source (where $I > 20$ % I_n)				
Maximeters		I1 max	I2 max	I3 max	IN max	



Protection		Micrologic 5.0 A / 6.0 A										
Long time												
Current setting (A)	$I_r = I_n \times \dots$		0.4	0.5	0.6	0.7	0.8	0.9	0.95	0.98	1	
Tripping between 1.05 and 1.20 x I_r		Other ranges or disable by changing long-time rating plug										
Time setting		tr (s)	0.5	1	2	4	8	12	16	20	24	
Time delay (s)	Accuracy: 0 to -30 %	1.5 x I_r	12.5	25	50	100	200	300	400	500	600	
	Accuracy: 0 to -20 %	6 x I_r	0.7 ⁽¹⁾	1	2	4	8	12	16	20	24	
	Accuracy: 0 to -20 %	7.2 x I_r	0.7 ⁽²⁾	0.69	1.38	2.7	5.5	8.3	11	13.8	16.6	
Thermal memory		20 minutes before and after tripping										
(1) 0 to -40 % - (2) 0 to -60 %												
Short time												
Pick-up (A)	$I_{sd} = I_r \times \dots$		1.5	2	2.5	3	4	5	6	8	10	
Accuracy: ± 10 %												
Time setting tsd (s)	Settings	I^2t Off	0	0.1	0.2	0.3	0.4					
		I^2t On	-	0.1	0.2	0.3	0.4					
Time delay (ms) at 10 x I_r (I^2t Off or I^2t On)	tsd (max resettable time)		20	80	140	230	350					
		tsd (max break time)	80	140	200	320	500					
Instantaneous												
Pick-up (A)	$I_i = I_n \times \dots$		2	3	4	6	8	10	12	15	off	
Accuracy: ± 10 %												
Time delay		Max resettable time: 20 ms Max break time: 50 ms										
Ground-fault												
Micrologic 6.0 A												
Pick-up (A)	$I_g = I_n \times \dots$	A	B	C	D	E	F	G	H	J		
Accuracy: ± 10 %	$I_n \leq 400$ A	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1		
	400 A < I_n < 1250 A	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1		
	$I_n \geq 1250$ A	500	640	720	800	880	960	1040	1120	1200		
Time setting tg (s)	Settings	I^2t Off	0	0.1	0.2	0.3	0.4					
		I^2t On	-	0.1	0.2	0.3	0.4					
Time delay (ms) at I_n or 1200 A (I^2t Off or I^2t On)	tg (max resettable time)		20	80	140	230	350					
		tg (max break time)	80	140	200	320	500					



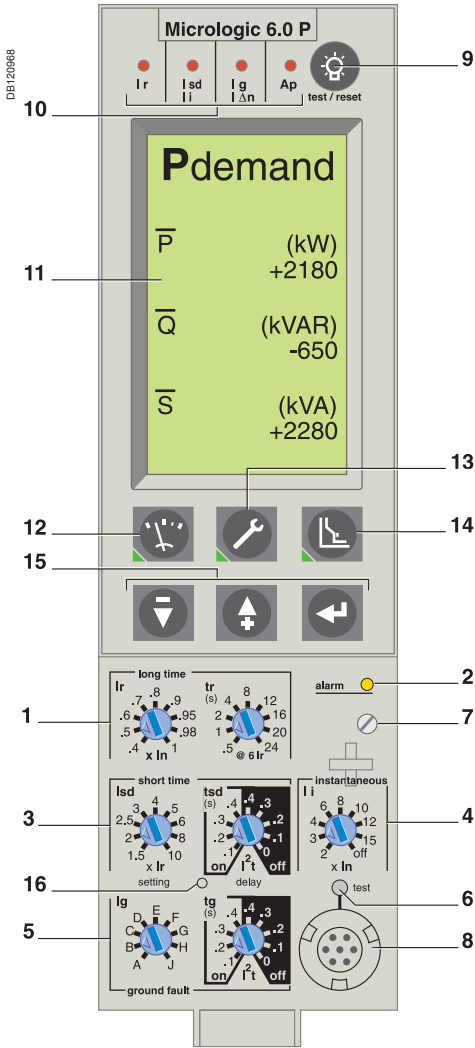
Ammeter		Micrologic 5.0 A / 6.0 A					
Continuous current measurements							
Display from 20 to 200 % of I_n		I1	I2	I3	IN	I_g	
Accuracy: 1.5 % (including sensors)		No auxiliary source (where $I > 20$ % I_n)					
Maximeters		I1 max	I2 max	I3 max	IN max	I_g max	



Note: all current-based protection functions require no auxiliary source.
The test / reset button resets maximeters, clears the tripping indication and tests the battery.



Micrologic P control units include all the functions offered by Micrologic A.
In addition, they measure voltages and calculate power and energy values.



- 1 Long-time current setting and tripping delay.
- 2 Overload signal (LED).
- 3 Short-time pick-up and tripping delay.
- 4 Instantaneous pick-up.
- 5 Ground-fault pick-up and tripping delay.
- 6 Ground-fault test button.
- 7 Long-time rating plug screw.
- 8 Test connector.
- 9 Lamp + battery test and indications reset.
- 10 Indication of tripping cause.
- 11 High-resolution screen.
- 12 Measurement display.
- 13 Maintenance indicators.
- 14 Protection settings.
- 15 Navigation buttons.
- 16 Hole for settings lockout pin on cover.

Protection..... +

Protection settings

The adjustable protection functions are identical to those of Micrologic A (overloads, short-circuits and ground-fault protection).

Fine adjustment

Within the range determined by the adjustment dial, fine adjustment of thresholds (to within one ampere) and time delays (to within one second) is possible on the keypad or remotely using the COM option.

IDMTL (Inverse Definite Minimum Time lag) setting

Coordination with fuse-type or medium-voltage protection systems is optimised by adjusting the slope of the overload-protection curve. This setting also ensures better operation of this protection function with certain loads.

Neutral protection

On three-pole circuit breakers, neutral protection may be set using the keypad or remotely using the COM option, to one of four positions: neutral unprotected (4P 3d), neutral protection at 0.5 Ir (4P 3d + N/2), neutral protection at Ir (4P 4d) and neutral protection at 1.6 Ir (4P 3d + 1.6N). Neutral protection at 1.6 Ir is used when the neutral conductor is twice the size of the phase conductors (major load imbalance, high level of third order harmonics).

On four-pole circuit breakers, neutral protection may be set using a three-position switch or the keypad: neutral unprotected (4P 3d), neutral protection at 0.5 Ir (4P 3d + N/2), neutral protection at Ir (4P 4d). Neutral protection produces no effect if the long-time curve is set to one of the IDMTL protection settings.

Programmable alarms and other protection.

Depending on the thresholds and time delays set using the keypad or remotely using the COM option, the Micrologic P control unit monitors currents and voltage, power, frequency and the phase sequence. Each threshold overrun is signalled remotely via the COM option. Each threshold overrun may be combined with tripping (protection) or an indication carried out by an optional M2C or M6C programmable contact (alarm), or both (protection and alarm).

Load shedding and reconnection.....

Load shedding and reconnection parameters may be set according to the power or the current flowing through the circuit breaker. Load shedding is carried out by a supervisor via the COM option or by an M2C or M6C programmable contact.

Indication option via programmable contacts

The M2C (two contacts) and M6C (six contacts) auxiliary contacts may be used to signal threshold overruns or status changes. They can be programmed using the keypad on the Micrologic P control unit or remotely using the COM option.

Communication option (COM)

The communication option may be used to:

- remotely read and set parameters for the protection functions
- transmit all the calculated indicators and measurements
- signal the causes of tripping and alarms
- consult the history files and the maintenance-indicator register.
- maximeter reset.

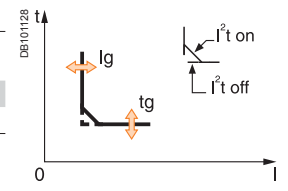
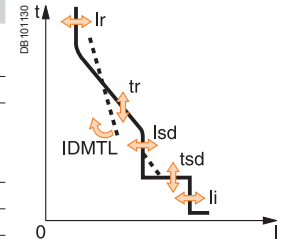
An event log and a maintenance register, stored in control-unit memory but not available locally, may be accessed in addition via the COM option.

Note: Micrologic P control units come with a non-transparent lead-seal cover as standard.



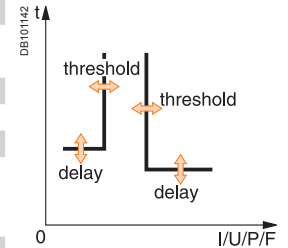
Protection Micrologic 5.0 / 6.0 P

Long time (rms)		Micrologic 5.0 / 6.0 P										
Current setting (A)	$I_r = I_n \times \dots$	0.4	0.5	0.6	0.7	0.8	0.9	0.95	0.98	1		
Tripping between 1.05 and 1.20 x I_r		Other ranges or disable by changing long-time rating plug										
Time setting	t_r (s)	0.5	1	2	4	8	12	16	20	24		
Time delay (s)	Accuracy: 0 to -30 %	1.5 x I_r	12.5	25	50	100	200	300	400	500	600	
	Accuracy: 0 to -20 %	6 x I_r	0.7 ⁽¹⁾	1	2	4	8	12	16	20	24	
	Accuracy: 0 to -20 %	7.2 x I_r	0.7 ⁽²⁾	0.69	1.38	2.7	5.5	8.3	11	13.8	16.6	
IDMTL setting	Curve slope	SIT	VIT	EIT	HVFuse	DT						
Thermal memory		20 minutes before and after tripping										
(1) 0 to -40 % - (2) 0 to -60 %												
Short time (rms)		Micrologic 6.0 P										
Pick-up (A)	$I_{sd} = I_r \times \dots$	1.5	2	2.5	3	4	5	6	8	10		
Accuracy: ±10 %												
Time setting t_{sd} (s)	Settings	I^2t Off	0	0.1	0.2	0.3	0.4					
		I^2t On	-	0.1	0.2	0.3	0.4					
Time delay (ms) at 10 I_r (I^2t Off or I^2t On)	t_{sd} (max resettable time)		20	80	140	230	350					
	t_{sd} (max break time)		80	140	200	320	500					
Instantaneous		Micrologic 6.0 P										
Pick-up (A)	$I_i = I_n \times \dots$	2	3	4	6	8	10	12	15	off		
Accuracy: ±10 %												
Time delay		Max resettable time: 20 ms Max break time: 50 ms										
Pick-up (A)	$I_g = I_n \times \dots$	A	B	C	D	E	F	G	H	J		
Accuracy: ±10 %	$I_n \leq 400$ A	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1		
	400 A < I_n < 1250 A	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1		
	$I_n \geq 1250$ A	500	640	720	800	880	960	1040	1120	1200		
Time setting t_g (s)	Settings	I^2t Off	0	0.1	0.2	0.3	0.4					
		I^2t On	-	0.1	0.2	0.3	0.4					
Time delay (ms) at I_n or 1200 A (I^2t Off or I^2t On)	t_g (max resettable time)		20	80	140	230	350					
	t_g (max break time)		80	140	200	320	500					



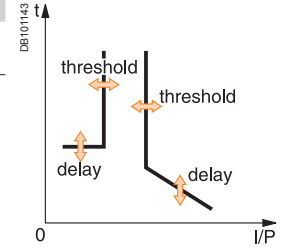
Alarms and other protection Micrologic 5.0 / 6.0 P

Current		Threshold	Delay
Current unbalance	$I_{unbalance}$	0.05 to 0.6 leverage	1 to 40 s
Max. demand current	$I_{max\ demand}$: I1, I2, I3, I _N	0.2 I_n to I_n	15 to 1500 s
Ground-fault alarm			
	I_{\neq}	10 to 100 % I_n ⁽³⁾	1 to 10 s
Voltage			
Voltage unbalance	$U_{unbalance}$	2 to 30 % x $U_{average}$	1 to 40 s
Minimum voltage	U_{min}	100 to U_{max} between phases	1.2 to 10 s
Maximum voltage ⁽⁴⁾	U_{max}	U_{min} to 1200 between phases	1.2 to 10 s
Power			
Reverse power	rP	5 to 500 kW	0.2 to 20 s
Frequency			
Minimum frequency	Fmin	45 to Fmax	1.2 to 5 s
Maximum frequency	Fmax	Fmin to 440 Hz	1.2 to 5 s
Phase sequence			
Sequence (alarm)	$\Delta\emptyset$	$\emptyset 1/2/3$ or $\emptyset 1/3/2$	0.3 s

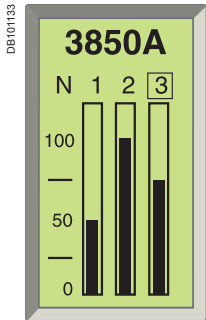


Load shedding and reconnection Micrologic 5.0 / 6.0 P

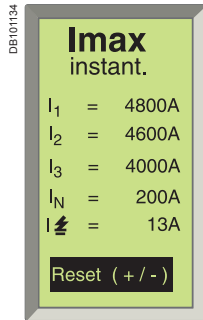
Measured value		Threshold	Delay
Current	I	0.5 to 1 I_r per phases	20 % t_r to 80 % t_r
Power	P	200 kW to 10 MW	10 to 3600 s
(3) $I_n \leq 400$ A 30 %			
400 A < I_n < 1250 A 20 %			
$I_n \geq 1250$ A 10 %			
(4) For 690 V applications, a step-down transformer must be used if the voltage exceeds the nominal value of 690 V by more than 10 %.			



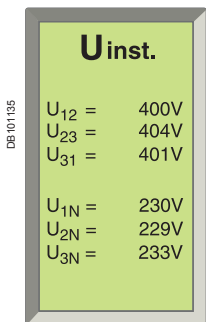
Note: all current-based protection functions require no auxiliary source.
Voltage-based protection functions are connected to AC power via a voltage measurement input built into the circuit breaker.



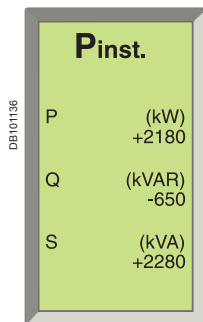
Default display.



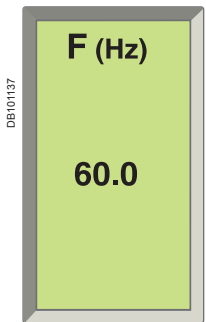
Display of a maximum current.



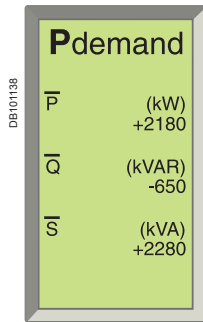
Display of a voltage.



Display of a power.



Display of a frequency.



Display of a demand power.



Power View software.

Measurements

The Micrologic P control unit calculates in real time all the electrical values (V, A, W, VAR, VA, Wh, VARh, VAh, Hz), power factors and $\cos \phi$ factors.

The Micrologic P control unit also calculates demand current and demand power over an adjustable time period. Each measurement is associated with a minimeter and a maximeter.

In the event of tripping on a fault, the interrupted current is stored. The optional external power supply makes it possible to display the value with the circuit breaker open or not supplied.

Instantaneous values

The value displayed on the screen is refreshed every second.

Minimum and maximum values of measurements are stored in memory (minimeters and maximeters).

Currents					
I rms	A	1	2	3	N
	A	G-fault			
I max rms	A	1	2	3	N
	A	G-fault			
Voltages					
U rms	V	12	23	31	
V rms	V	1N	2N	3N	
U average rms	V	(U12 + U23 + U31) / 3			
U unbalance	%				
Power, energy					
P active, Q reactive, S apparent	W, Var, VA	Totals			
E active, E reactive, E apparent	Wh, VARh, VAh	Totals consumed - supplied			
		Totals consumed			
		Totals supplied			
Power factor	PF	Total			
Frequencies					
F	Hz				

Demand metering

The demand is calculated over a fixed or sliding time window that may be programmed from 5 to 60 minutes. According to the contract signed with the power supplier, an indicator associated with a load shedding function makes it possible to avoid or minimise the costs of overrunning the subscribed power. Maximum demand values are systematically stored and time stamped (maximeter).

Currents					
I demand	A	1	2	3	N
	A	G-fault			
I max demand	A	1	2	3	N
	A	G-fault			
Power					
P, Q, S demand	W, Var, VA	Totals			
P, Q, S max demand	W, Var, VA	Totals			

Minimeters and maximeters

Only the current and power maximeters may be displayed on the screen.

Time-stamping

Time-stamping is activated as soon as time is set manually or by a supervisor. No external power supply module is required (max. drift of 1 hour per year).

Reset

An individual reset, via the keypad or remotely, acts on alarms, minimum and maximum data, peak values, the counters and the indicators.

Additional measurements accessible with the COM option

Some measured or calculated values are only accessible with the COM communication option:

- $I_{peak} / \sqrt{2}$, $(I_1 + I_2 + I_3) / 3$, I unbalance
- load level in % I_r
- total power factor.

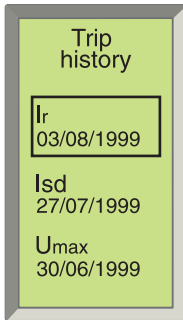
Additional info

Accuracy of measurements (including sensors):

- voltage (V) 0.5 %
- current (A) 1.5 %
- frequency (Hz) 0.1 %
- power (W) and energy (Wh) 2 %

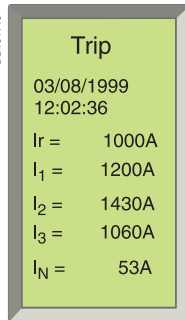


DB10139



Display of a tripping history.

DB10140



Display after tripping.

Histories and maintenance indicators.....

The last ten trips and alarms are recorded in two separate history files that may be displayed on the screen.

■ Tripping history:

- type of fault
- date and time
- values measured at the time of tripping (interrupted current, etc.)

■ Alarm history:

- type of alarm
- date and time
- values measured at the time of the alarm.

All the other events are recorded in a third history file which is only accessible through the communication network.

■ Event log history (only accessible through the communication network)

- Modifications to settings and parameters
- Counter resets
- System faults:
- Fallback position
- Thermal self-protection
- Loss of time
- Overrun of wear indicators
- Test-kit connections
- etc.

Note: all the events are time stamped: time-stamping is activated as soon as time is set manually or by a supervisor. No external power supply module is required (max. drift of 1 hour per year).

Maintenance indicators (with COM option)

A number of maintenance indicators may be called up on the screen to better plan for device maintenance:

- contact wear
- operation counter:
- cumulative total
- total since last reset.

Additional maintenance indicators are also available through the COM network, and can be used as an aid in troubleshooting:

- highest current measured
- number of test-kit connections
- number of trips in operating mode and in test mode.

Additional technical characteristics

Safety

Measurement functions are independent of the protection functions.

The high-accuracy measurement module operates independently of the protection module.

Simplicity and multi-language

Navigation from one display to another is intuitive. The six buttons on the keypad provide access to the menus and easy selection of values. When the setting cover is closed, the keypad may no longer be used to access the protection settings, but still provides access to the displays for measurements, histories, indicators, etc.

Micrologic is also multi-language, including the following languages: English, Spanish, Portuguese, Russian, Chinese, French, German...

Intelligent measurement

Measurement-calculation mode:

- energies are calculated on the basis of the instantaneous power values, in two manners:
 - the traditional mode where only positive (consumed) energies are considered
 - the signed mode where the positive (consumed) and negative (supplied) energies are considered separately.

■ measurement functions implement the new "zero blind time" concept which consists in continuously measuring signals at a high sampling rate. The traditional "blind window" used to process samples no longer exists. This method ensures accurate energy calculations even for highly variable loads (welding machines, robots, etc.).

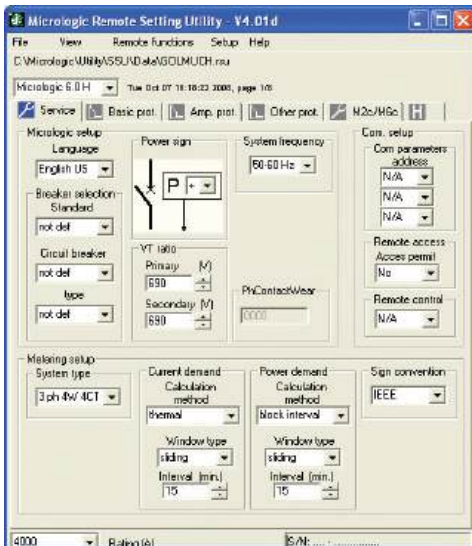
Always powered

All current-based protection functions require no auxiliary source. Voltage-based protection functions are connected to AC power via a voltage measurement input built into the circuit breaker.

Stored information

The fine setting adjustments, the last 100 events and the maintenance register remain in the control-unit memory even when power is lost.

DB120970A



RSU configuration screen for a Micrologic.



Micrologic control units

Micrologic H “harmonics”

Micrologic H control units include all the functions offered by Micrologic P. Integrating significantly enhanced calculation and memory functions, the Micrologic H control unit offers in-depth analysis of power quality and detailed event diagnostics. It is intended for operation with a supervisor.

In addition to the Micrologic P functions, the Micrologic H control unit offers:

- in-depth analysis of power quality including calculation of harmonics and the fundamentals
- diagnostics aid and event analysis through waveform capture
- enhanced alarm programming to analyse and track down a disturbance on the AC power system.

Measurements.....

The Micrologic H control unit offers all the measurements carried out by Micrologic P, with in addition:

- phase by phase measurements of:
 - power, energy
 - power factors
- calculation of:
 - current and voltage total harmonic distortion (THD)
 - current, voltage and power fundamentals
 - current and voltage harmonics up to the 31st order.

Instantaneous values displayed on the screen

Currents

I rms	A	1	2	3	N
	A	G-fault			
I max rms	A	1	2	3	N
	A	G-fault			

Voltages

U rms	V	12	23	31
V rms	V	1N	2N	3N
U average rms	V	(U12 + U23 + U31) / 3		
U unbalance	%			

Power, energy

P active, Q reactive, S apparent	W, Var, VA	Totals	1	2	3
E active, E reactive, E apparent	Wh, VARh, VAh	Totals consumed - supplied			
		Totals consumed			
		Totals supplied			
Power factor	PF	Total	1	2	3

Frequencies

F	Hz
---	----

Power-quality indicators

Total fundamentals		U	I	P	Q	S	
THD	%	U I					
U and I harmonics	Amplitude	3	5	7	9	11	13

Harmonics 3, 5, 7, 9, 11 and 13, monitored by electrical utilities, are displayed on the screen.

Demand measurements

Similar to the Micrologic P control unit, the demand values are calculated over a fixed or sliding time window that may be set from 5 to 60 minutes.

Currents

I demand	A	1	2	3	N
	A	G-fault			
I max demand	A	1	2	3	N
	A	G-fault			

Power

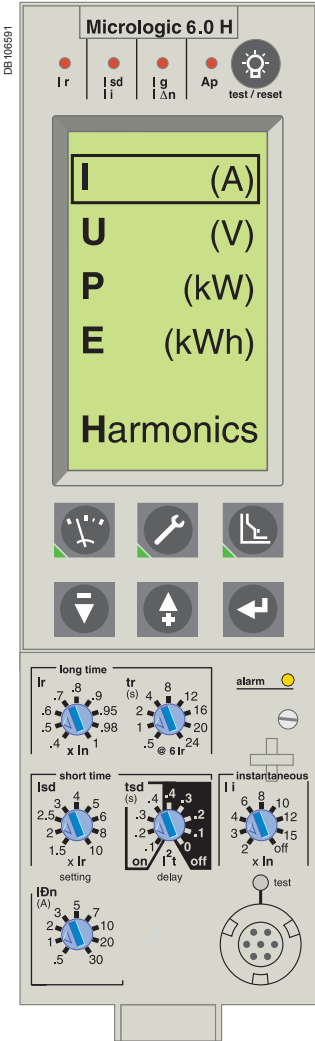
P, Q, S demand	W, Var, VA	Totals
P, Q, S max demand	W, Var, VA	Totals

Maximeters

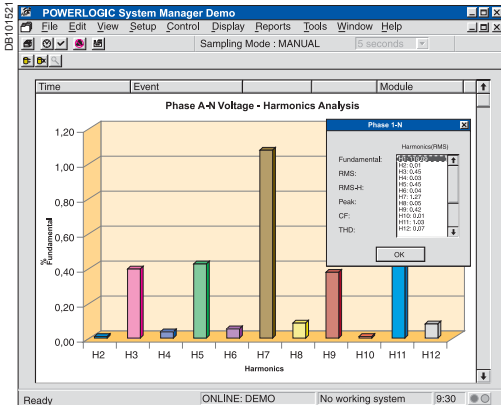
Only the current maximeters may be displayed on the screen.

Histories and maintenance indicators

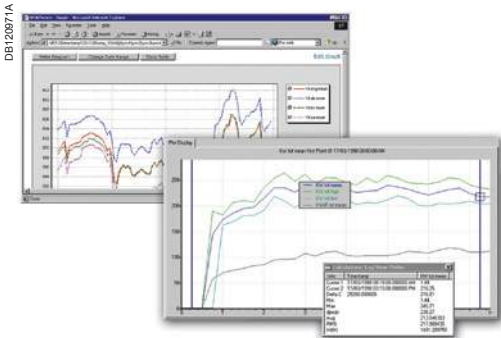
These functions are identical to those of the Micrologic P.



Note: Micrologic H control units come with a non-transparent lead-seal cover as standard.



Display of harmonics up to 12th order.



Label	N°	Stat	Pu.val	Unit	Pu.dly	Do.val	Unit	Do.dly	Log
Over Current Phase A	1	Off	N/A	A	N/A	N/A	A	N/A	Off
Over Current Phase B	2	Off	N/A	A	N/A	N/A	A	N/A	Off
Over Current Phase C	3	Off	N/A	A	N/A	N/A	A	N/A	Off
Over Neutral Current	4	Off	N/A	A	N/A	N/A	A	N/A	Off
Over Ground Current	5	Off	N/A	A	N/A	N/A	A	N/A	Off
Under Current Phase A	6	Off	N/A	A	N/A	N/A	A	N/A	Off
Under Current Phase B	7	Off	N/A	A	N/A	N/A	A	N/A	Off
Under Current Phase C	8	Off	N/A	A	N/A	N/A	A	N/A	Off
Over Current Unbalan...	9	Off	N/A	A	N/A	N/A	A	N/A	Off
Over Current Unbalan...	10	Off	N/A	A	N/A	N/A	A	N/A	Off
Over Current Unbalan...	11	Off	N/A	A	N/A	N/A	A	N/A	Off
Over Voltage Phase A	12	Off	N/A	V	N/A	N/A	V	N/A	Off
Over Voltage Phase B	13	Off	N/A	V	N/A	N/A	V	N/A	Off
Over Voltage Phase C	14	Off	N/A	V	N/A	N/A	V	N/A	Off
Under Voltage Phase A	15	Off	N/A	V	N/A	N/A	V	N/A	Off
Under Voltage Phase B	16	Off	N/A	V	N/A	N/A	V	N/A	Off
Under Voltage Phase C	17	Off	N/A	V	N/A	N/A	V	N/A	Off
Over Voltage Unbalan...	18	Off	N/A	%	N/A	N/A	%	N/A	Off
Over Voltage Unbalan...	19	Off	N/A	%	N/A	N/A	%	N/A	Off
Over Voltage Unbalan...	20	Off	N/A	%	N/A	N/A	%	N/A	Off
Over kVA 3ph Total	21	Off	N/A	kVA	N/A	N/A	kVA	N/A	Off
Over kW Into the Load	22	Off	N/A	kW	N/A	N/A	kW	N/A	Off
Over kW Out of the L...	23	Off	N/A	kW	N/A	N/A	kW	N/A	Off

Log.

With the communication option

Additional measurements, maximeters and minimeters

Certain measured or calculated values are only accessible with the COM communication option:

- $I_{peak} / \sqrt{2} (I_1 + I_2 + I_3) / 3, I_{unbalance}$
- load level in % Ir
- power factor (total and per phase)
- voltage and current THD
- K factors of currents and average K factor
- crest factors of currents and voltages
- all the fundamentals per phase
- fundamental current and voltage phase displacement
- distortion power and distortion factor phase by phase
- amplitude and displacement of current and voltage harmonics 3 to 31.

The maximeters and minimeters are available only via the COM option for use with a supervisor.

Waveform capture

The Micrologic H control unit stores the last 4 cycles of each instantaneous current or voltage measurement. On request or automatically on programmed events, the control unit stores the waveforms. The waveforms may be displayed in the form of oscillograms by a supervisor via the COM option. Definition is 64 points per cycle.

Pre-defined analogue alarms (1 to 53)

Each alarm can be compared to user-set high and low thresholds. Overrun of a threshold generates an alarm. An alarm or combinations of alarms can be linked to programmable action such as selective recording of measurements in a log, waveform capture, etc.

Event log and maintenance registers

The Micrologic H offers the same event log and maintenance register functions as the Micrologic P. In addition, it produces a log of the minimums and maximums for each "real-time" value.

Additional technical characteristics

Setting the display language

System messages may be displayed in six different languages. The desired language is selected via the keypad.

Protection functions

All current-based protection functions require no auxiliary source. Voltage-based protection functions are connected to AC power via a voltage measurement input built into the circuit breaker.

Measurement functions

Measurement functions are independent of the protection functions.

The high-accuracy measurement module operates independently of the protection module, while remaining synchronised with protection events.

Measurement-calculation mode

An analogue calculation function dedicated to measurements enhances the accuracy of harmonic calculations and the power-quality indicators. The Micrologic H control unit calculates electrical magnitudes using 1.5 x In dynamics (20 x In for Micrologic P).

Measurement functions implement the new "zero blind time" concept

Energies are calculated on the basis of the instantaneous power values, in the traditional and signed modes.

Harmonic components are calculated using the discrete Fourier transform (DFT).

Accuracy of measurements (including sensors)

- voltage (V) 0.5 %
- current (A) 1.5 %
- frequency (Hz) 0.1 %
- power (W) and energy (Wh) 2 %
- total harmonic distortion 1 %.

Stored information

The fine-setting adjustments, the last 100 events and the maintenance register remain in the control-unit memory even when power is lost.

Time-stamping

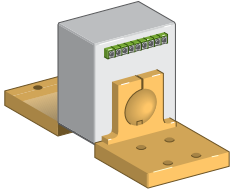
Time-stamping is activated as soon as time is set manually or by a supervisor no external power supply module is required (max. drift of 1 hour per year).

Reset

An individual reset, via the keypad or remotely, acts on alarms, minimum and maximum data, peak values, the counters and the indicators.



DB101524



External sensor (CT).

06133779A



External sensor for source ground return protection.

PB10073A-32



PB10102E-32A



PB100771A-24



External sensors

External sensor for ground-fault and neutral protection

The sensors, used with the 3P circuit breakers, are installed on the neutral conductor for:

- neutral protection (with Micrologic P and H)
- residual type ground-fault protection (with Micrologic A, P and H).

The rating of the sensor (CT) must be compatible with the rating of the circuit breaker:

- NT08 to NT12: TC 400/1600
- NW08 to NW20: TC 400/2000
- NW25 to NW30: TC 1000/4000
- NW40 to NW50: TC 4000/6300.

External sensor for source ground return protection

The sensor is installed around the connection of the transformer neutral point to earth and connects to the Micrologic 6.0 control unit via an MDGF module to provide the source ground return (SGR) protection.

Voltage measurement inputs

Voltage measurement inputs are required for power measurements (Micrologic P or H).

As standard, the control unit is supplied by internal voltage measurement inputs placed downstream of the pole for voltages between 220 and 690 V AC. On request, it is possible to replace the internal voltage measurement inputs by an external voltage input (PTE option) which enables the control unit to draw power directly from the distribution system upstream of the circuit breaker. An 3 m cable with ferrite comes with this PTE option.

Long-time rating plug

Eight interchangeable plugs may be used to limit the long-time threshold setting range for higher accuracy.

The time delay settings indicated on the plugs are for an overload of 6 Ir.

As standard, control units are equipped with the 0.4 to 1 plug.

Plug	Setting ranges $I_r = I_n \times \dots$									
UL Listed	Type A ⁽¹⁾	0.4	0.45	0.5	0.6	0.63	0.7	0.8	0.9	1
	Type B	0.4	0.44	0.5	0.56	0.63	0.75	0.88	0.95	1
	Type C	0.42	0.50	0.53	0.58	0.67	0.75	0.83	0.95	1
	Type D	0.4	0.48	0.64	0.7	0.8	0.9	0.93	0.95	1
	Type E	0.6	0.7	0.75	0.8	0.85	0.9	0.93	0.95	1
	Type F	0.84	0.86	0.88	0.9	0.92	0.94	0.96	0.98	1
	Type G	0.66	0.68	0.7	0.72	0.74	0.76	0.78	0.8	0.82
	Type H	0.48	0.5	0.52	0.54	0.56	0.58	0.6	0.62	0.64

(1) Standard.

External 24 V DC power-supply module (AD module)

The external power-supply module makes it possible to use the display even if the circuit breaker is open or not supplied (for the exact conditions of use, see the "electrical diagrams" part of this catalogue).

This module powers both the control unit (100 mA) and the M2C and M6C programmable contacts (100 mA).

If the COM communication option is used, the communication bus requires its own 24 V DC power supply, independent with respect to that of the Micrologic control unit.

With the Micrologic A control unit, this module makes it possible to display currents of less than 20 % of I_n .

With the Micrologic P and H, it can be used to display fault currents after tripping.

Characteristics

- Power supply:
 - 110/130, 200/240, 380/415 V AC (+10 %, -15 %)
 - 24/30, 48/60, 100/125 V DC (+20 %, -20 %)
- Output voltage: 24 V DC $\pm 5 \%$, 200 mA
- Ripple < 1 %
- Dielectric withstand: 3.5 kV rms between input/output, for 1 minute
- Overvoltage category: as per IEC 60947-1 cat 4.

Battery module

The battery module maintains display operation and communication with the supervisor if the power supply to the Micrologic control unit is interrupted. It is installed in series between the Micrologic control unit and the AD module.

Characteristics

- Battery run-time: 4 hours (approximately)
- Mounted on vertical backplate or symmetrical rail.



PB100774A-32



M2C.

PB100781A-32



M6C.

M2C, M6C programmable contacts

These contacts are optional equipment for the Micrologic P and H control units. They are described with the indication contacts for the circuit breakers.

Characteristics			M2C/M6C
Minimum load			100 mA/24 V
Breaking capacity (A) p.f.: 0.7	V AC	240	5
		380	3
	V DC	24	1.8
		48	1.5
		125	0.4
		250	0.15

M2C: 24 V DC power supplied by control unit (consumption 100 mA).

M6C: external 24 V DC power supply required (consumption 100 mA).

PB100775A-32



Lead-seal cover.

Spare parts

Lead-seal covers

A lead-seal cover controls access to the adjustment dials.

When the cover is closed:

- it is impossible to modify settings using the keypad unless the settings lockout pin on the cover is removed
- the test connector remains accessible
- the test button for the ground-fault protection function remains accessible.

Characteristics

- Transparent cover for basic Micrologic and Micrologic A control units
- Non-transparent cover for Micrologic P and H control units.

Spare battery

A battery supplies power to the LEDs identifying the tripping causes. Battery service life is approximately ten years.

A test button on the front of the control unit is used to check the battery condition.

The battery may be replaced on site when discharged.

PB100837A-88



Portable test kit.

Test equipment

Hand-held test kit

The hand-held mini test kit may be used to:

- check operation of the control unit and the tripping and pole-opening system by sending a signal simulating a short-circuit
- supply power to the control units for settings via the keypad when the circuit-breaker is open (Micrologic P and H control units).
- Power source: standard LR6-AA battery.

Full function test kit

The test kit can be used alone or with a supporting personal computer.

The test kit without PC may be used to check:

- the mechanical operation of the circuit breaker
- the electrical continuity of the connection between the circuit breaker and the control unit
- operation of the control unit:
 - display of settings
 - automatic and manual tests on protection functions
 - test on the zone-selective interlocking (ZSI) function
 - inhibition of the ground-fault protection
 - inhibition of the thermal memory.

The test kit with PC offers in addition:

- the test report (software available on request).

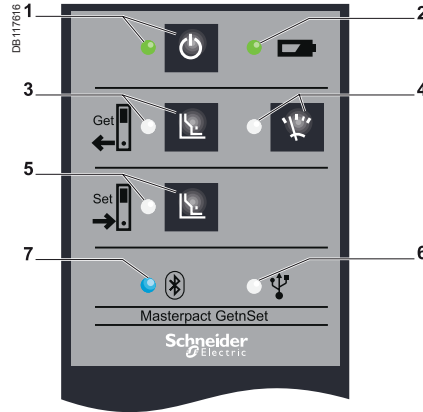


GetnSet is a portable data acquisition and storage accessory that connects directly to the Micrologic control units of Masterpact circuit breakers to read important electrical installation operating data and Masterpact protection settings. This information is stored in the GetnSet internal memory and can be transferred to a PC via USB or Bluetooth for monitoring and analysis.

Overview of Masterpact GetnSet functions

GetnSet (1) is a portable data acquisition and storage device that works like a USB drive, letting users manually transfer data to and from a Masterpact circuit breaker or PC. GetnSet can download operating data from Masterpact and download or upload settings. Downloadable operating data include measurements, the last 3 trip history records and contact wear status. Accessible settings include protection thresholds, external relay assignment modes and pre-defined alarm configurations if applicable.

(1) See page F-2 for catalogue numbers.



- 1 On/Off
- 2 batterie indicator
- 3 Download settings
- 4 Download operating parameters
- 5 Upload settings
- 6 USB indicator
- 7 Bluetooth indicator

Operating data functions

Electrical installation information such as energy measurements and contact wear status is increasingly important to help reduce operating expenses and increase the availability of electrical power. Such data is often available from devices within the installation, but needs to be gathered and aggregated to allow analysis and determine effective improvement actions.

With GetnSet, this operating data can be easily read and stored as .dgl files in the internal memory. It can then be transferred to a PC via a USB or Bluetooth link and imported in an Excel spreadsheet.

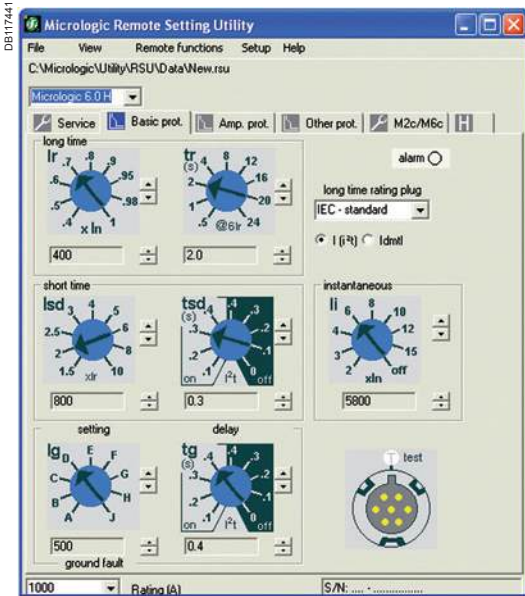
The provided Excel spreadsheet can be used to display the operating data from several breakers in order to:

- analyse changes in parameters such as energy, power factor and contact wear
- compare the values of parameters between circuit breakers
- create graphics and reports using standard Excel tools

GetnSet data accessible in the Excel spreadsheet

Micrologic Identification			
Circuit Breaker Name	Lighting breaker	Main feeder	
Circuit Number	00000010	12225010	
Line	F 0 H		
Record Name	RC00001_01.dgl	12225010_01.dgl	
F & Path of .dgl File	Settings E30W623 Breaktop	Settings E30W623 Breaktop	
Energy			
ActiveEnergy (kWh)	110	66	
ReactiveEnergy (kVArh)	98	39	
ActiveEnergy (kVAh)	66	66	
ActiveEnergy-OUT (kVAh)	98	100	
ReactiveEnergy (kVArh)	80	20	
ReactiveEnergy-OUT (kVArh)	20	20	
ApparentEnergy (kVAh)	104	16	
TRIP Record			
1st Last Trip			
Date	Date: 02/22/2007	Time	Date: 06/05/2008
Time	11:00:40:340		00:18:00:2360
Cause Alarm Number	0005		N/A
Threshold (A)	1250		3277700
Time Limit (Sec)	20		N/A
Phase A Opening Current (A)	1100		N/A
Phase B Opening Current (A)	0		N/A
Phase C Opening Current (A)	0		N/A
Phase A Opening Current (kA)	0		N/A
Phase B Opening Current (kA)	0		N/A
Phase C Opening Current (kA)	0		N/A
Contact Wear Indicator			
2nd Last Trip			
Date	Date: 03/02/2007	Time	Date: 06/04/2008
Time			

Type of data	Micrologic		
Current	A	P	H
Energy, voltages, frequency, power, power factor		P	H
Power quality: fundamental, harmonics			H
Trip history		P	H
Contact wear		P	H



Protection setting functions

GetnSet can also be used to back up circuit breaker settings and restore them on the same device or, under certain conditions, copy them to any Masterpact circuit breaker equipped with the same type of Micrologic control unit. This concerns only advanced settings, as other parameters must be set manually using the dials on the Micrologic control unit.

- When commissioning the installation, safeguard the configuration parameters of your electrical distribution system by creating a back-up of circuit breaker settings so that they can be restored at any time.

- The settings read by GetnSet can be transferred to a PC and are compatible with RSU software (Remote Setting Utility). Protection configurations can also be created on a PC using this software, copied to GetnSet's internal memory and uploaded to a Masterpact circuit breaker with a compatible Micrologic trip unit and dial settings.

Operating procedure

The procedure includes several steps.

- Plug GetnSet into the receptacle on the front of the Micrologic control unit of a Masterpact circuit breaker.
- On the keypad, select the type of data (operating data or settings) and the transfer direction (download or upload). This operation can be done as many times as required for the entire set of Masterpact circuit breakers.
- Downloaded data is transferred to the GetnSet internal memory and a file is created for each Masterpact device (either an .rsu file for settings or a .dgl file for operating data).
- Data can be transferred between GetnSet and a PC via a USB or Bluetooth connection.
- Operating data can be imported in an Excel spreadsheet and protection settings can be read with RSU (remote setting utility) software.

Features

- Battery-powered to power a Micrologic control unit even if the breaker has been opened or tripped. This battery provides power for an average of 1 hour of use, enough for more than 100 download operations.
- Can be used on Masterpact circuit breakers equipped or not equipped with a Modbus "device" communication module.
- Portable, standalone accessory eliminating the need for a PC to connect to a Masterpact circuit breaker.
- No driver or software required for GetnSet connection to a PC.
- Can be used with many circuit breakers, one after the other.
- Embedded memory sized to hold data from more than 5000 circuit breakers.
- Supplied with its battery, a cable for connection to Micrologic trip units, a USB cable for connection to a PC and a battery charger.

Compatibility

- Micrologic control units A, P, H
- PC with USB port or Bluetooth link and Excel software

Technical characteristics

Charger power supply	100 – 240 V; ~1A; 50 – 60 Hz
Charger power consumption	Max 100 W
Battery	3.3 V DC; 9mAh; Li-Ion
Operating temperature	-20 to +60 °C
GetnSet dimensions	95 x 60 x 35 mm



Communication

COM option in Masterpact

The COM option is required for integration of the circuit breaker or switch-disconnector in a supervision system.

Masterpact uses the Modbus communications protocol for full compatibility with electrical-installation management systems.

An external gateway is available for communication on other networks:

- Ion Enterprise (power management system)
- Ethernet gateway (MPS100/EGX)
- Ethernet
- Profibus

Eco COM is limited to the transmission of metering data and does not allow the control of the circuit breaker.

For fixed devices, the COM option is made up of:

- a "device" communication module, installed behind the Micrologic control unit and supplied with its set of sensors (OF, SDE, PF and CH micro-contacts) and its kit for connection to XF and MX1 communicating voltage releases.

For drawout devices, the COM option is made up of:

- a "device" communication module, installed behind the Micrologic control unit and supplied with its set of sensors (OF, SDE, PF and CH micro-contacts) and its kit for connection to XF and MX1 communicating voltage releases
- a "chassis" communication module supplied separately with its set of sensors (CE, CD and CT contacts).

Status indication by the COM option is independent of the device indication contacts. These contacts remain available for conventional uses.

Modbus "Device" communication module

This module is independent of the control unit. It receives and transmits information on the communication network. An infra-red link transmits data between the control unit and the communication module.

Consumption: 30 mA, 24 V.

Modbus "chassis" communication module

This module is independent of the control unit. With Modbus "chassis" communication module, this module makes it possible to address the chassis and to maintain the address when the circuit breaker is in the disconnected position.

Consumption: 30 mA, 24 V.

XF and MX1 communicating voltage releases

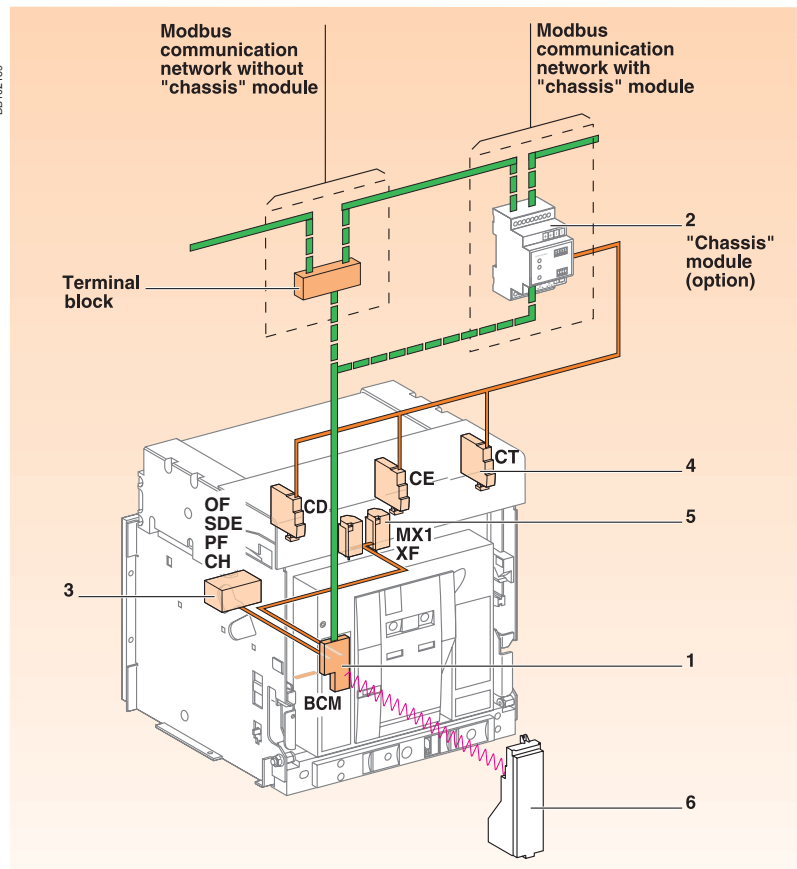
The XF and MX1 communicating voltage releases are equipped for connection to the "device" communication module.

The remote-tripping function (MX2 or MN) are independent of the communication option. They are not equipped for connection to the "device" communication module.



Modbus "device" communication module.

Modbus "chassis" communication module.



- 1 "Device" communication module.
- 2 "Chassis" communication module (option).
- 3 OF, SDE, PF and CH communicating "device" sensors.
- 4 CE, CD and CT communicating "chassis" sensors.
- 5 MX1 and XF communicating release.
- 6 Control unit.

— : Hard wire.
— : Communication bus.



Overview of functions

056484N-80



The Masterpact circuit breakers and switch-disconnectors are compatible with the Modbus COM option.

The COM option may be used to:

- identify the device
- indicate status conditions
- control the device.

Depending on the different types of Micrologic (A, P, H) control units, the COM option also offers:

- setting of the protection and alarms functions
- analysis of the AC-power parameters for operating-assistance and maintenance purposes.

	Switch-disconnector with communication bus Modbus	Circuit breaker with communication bus Modbus
Device identification		
Address	■	A P H
Rating	-	A P H
Type of device	-	P H
Type of control unit	-	A P H
Type of long-time rating plug	-	A P H
Status indications		
ON/OFF OF	■	A P H
Spring charged CH	■	A P H
Ready to close PF	(1)	A P H
Fault-trip SDE	■	A P H
Connected/disconnected/ test position CE/CD/CT	■	A P H
Controls		
ON/OFF MX/XF	■	A P H
Spring charging	-	
Reset of the mechanical indicator	-	
Protections and alarms settings		
Reading of protections settings		A P H
Writing of fine settings in the range imposed by the adjustment dials		P H
Reading/writing of alarms (load shedding and reconnect, etc.)		P H
Reading/writing of custom alarms		H
Operating and maintenance aids		
Measurement		
Current		A P H
Voltages, frequency, power, etc.		P H
Power quality: fundamental, harmonics		H
Programming of demand metering		P H
Fault readings		
Type of fault		A P H
Interrupted current		P H
Waveform capture		
On faults		H
On demand or programmed		H
Histories and logs		
Trip history		P H
Alarm history		P H
Event logs		P H
Indicators		
Counter operation		A P H
Contact wear		P H
Maintenance register		P H

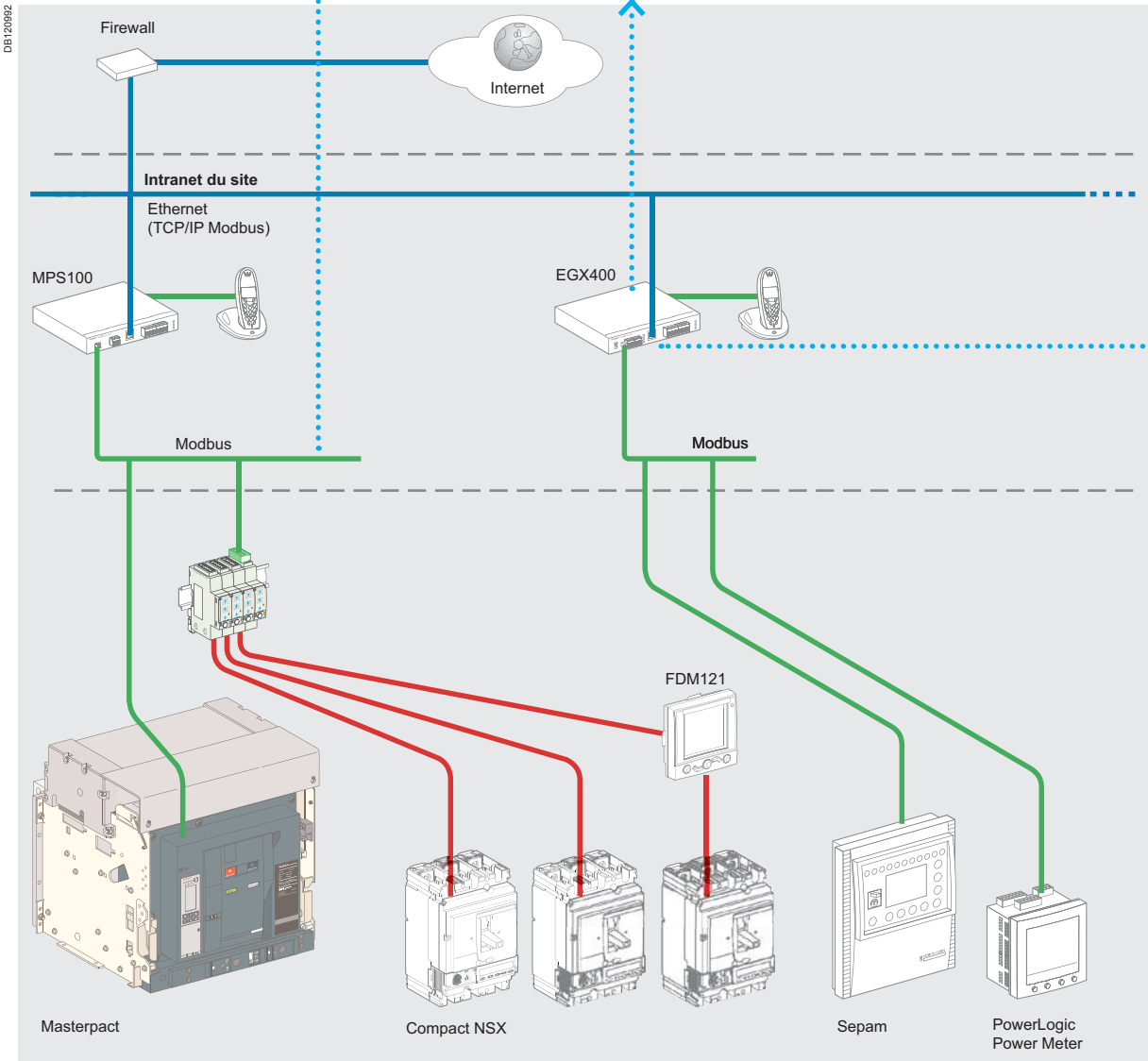
Note: see the description of the Micrologic control units for further details on protection and alarms, measurements, waveform capture, histories, logs and maintenance indicators.

(1) With Modbus it is possible to monitor the PF status please use the instruction bulletin COMBT32AK at page 51/Register 661 documentation.



Modbus

- Modbus is the most widely used communication protocol in industrial networks.
- Masterpact, Compact NSX, PowerLogic and Sepam products all operate with this protocol. A Modbus network is generally implemented on an LV or MV switchboard scale.



Gateway

A Modbus TCP gateway can be used to connect the Modbus network to ethernet. The gateway has the two main functions:

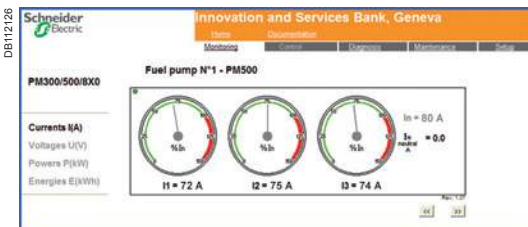
- access to the company intranet (Ethernet) by converting Modbus frames to the TCP/Modbus protocol,
 - optional web-page server for the information from the devices.
- Examples include MPS100, EGX400 and EGX100.

MPS100

■ Plug and play device. It comes loaded with a web-page application for graphic display of currents and voltages and viewing of circuit-breaker status and power and energy values.

To use the application, simply declare the Modbus addresses of the connected slaves. Automatically recognised devices include all Masterpact and Compact NSX Micrologic trip units and the PM500/700/800 and PM9c power monitoring units.

- Can be used for automatic alarm notification via a messaging server available on the site intranet or via mobile phones (e-mail converted into SMS).
- Can be used for logging of data that can be automatically sent as e-mail attachments, e.g. a weekly consumption report.





Communication bus

Modbus bus

The Modbus (RS 485) system is an open bus on which communicating Modbus devices (Masterpact with Modbus COM, Sepam, VigiloHM, etc.) are installed. All types of PLCs and microcomputers may be connected to the bus.

Addresses

The Modbus parameters (address, baud rate, parity) are entered using the keypad on the Micrologic A, P or H. For an automatic switch, it is necessary to use the RSU (Remote Setting Utility) Micrologic utility.

The software layer of the Modbus protocol can manage up to 255 addresses (1 to 255).

The "device" communication module comprises three addresses linked to:

- circuit-breaker manager
- measurement manager
- protection manager.

The "chassis" communication module comprises one address linked to the chassis manager.

The division of the system into four managers secures data exchange with the supervision system and the circuit-breaker actuators.

The manager addresses are automatically derived from the circuit-breaker address @xx entered via the Micrologic control unit (the default address is 47).

Logic addresses

@xx	Circuit-breaker manager	(1 to 47)
@xx + 50	Chassis manager	(51 to 97)
@xx + 200	Measurement manager	(201 to 247)
@xx + 100	Protection manager	(101 to 147)

Number of devices

The maximum number of devices that may be connected to the Modbus bus depends on the type of device (Masterpact with Modbus COM, PM500, Sepam, VigiloHM, etc.), the baud rate (19200 is recommended), the volume of data exchanged and the desired response time. The RS 485 physical layer offers up to 32 connection points on the bus (1 master, 31 slaves).

A fixed device requires only one connection point (communication module on the device).

A drawout device uses two connection points (communication modules on the device and on the chassis).

The number must never exceed 31 fixed devices or 15 drawout devices.

Length of bus

The maximum recommended length for the Modbus bus is 1200 meters.

Bus power source

A 24 V DC power supply is required (less than 20 % ripple, insulation class II).

Devices

Circuit breakers equipped with Micrologic control units may be connected to either a Digipact or Modbus communication bus. The information made available depends on the type of Micrologic control unit (A, P or H) and on the type of communication bus (Modbus).

Automatic switches can be connected to the Modbus communication bus.

The information made available is the status of the automatic switch.



The MPS100 Micro Power Server:

- notifies maintenance staff when any preset alarm or trip is activated by the Micrologic trip unit, automatically sending an e-mail and/or SMS
- data logs are periodically forwarded by e-mail
- the e-mails are sent via an Ethernet local area network (LAN) or remotely via modem.

Micro Power Server makes data collection easy for monitoring Masterpact/Compact circuit breakers

Now, more than ever, there is a need to monitor electrical distribution systems in industrial and large commercial applications. The key to managing all equipment, maximising efficiencies, reducing costs and increasing up time is having the right tools.

Micro Power Server MPS100 is designed to withstand harsh electrical environments and provide a consistent flow of easy to interpret information.

Micro Power Server is designed for unattended operation within the main LV switchboard

The MPS100 is a self-contained facility information server that serves as a stand-alone device for power system monitoring.

It is used to transfer power system information via a standard web browser over an Ethernet local area network (LAN) or via modem, making it possible to view power system information on a PC with an Ethernet connection.

In either capacity, the Micro Power Server functions as a web server for Micrologic trip unit and Power Meter supervision, automatically notifying (e-mail and/or SMS) maintenance staff when any preset alarm or trip is activated in the Micrologic trip unit.

Benefits

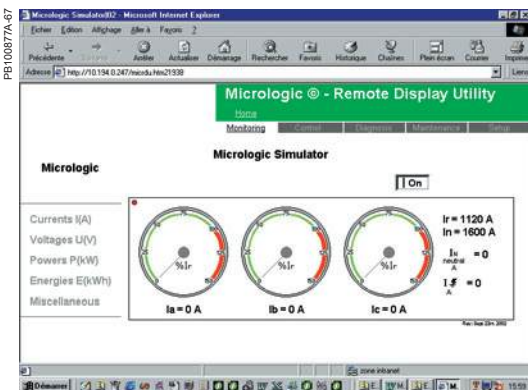
- View your main LV switchboard without installing software on your local PC, eliminating the need for a dedicated PC with specific software
- Micro Power Server allows centralised monitoring, so you no longer waste precious time walking around the facility to collect data
- View your main LV switchboard via a modem connection (GSM or switched network), avoiding the need for a LAN
- Maintenance people are automatically notified at any time, wherever they are, so you do not have to stay in front of a monitor all day long
- Data logs can be periodically forwarded by sending e-mails to the relevant people (maintenance, accounting, application service provider) automatically
- Possibility to monitor/notify six external events (limit switches, auxiliary switches...)
- Back-up of Micrologic trip unit settings in the memory of the MPS100, so you know where to retrieve it when necessary.



MPS100 Micro Power Server.



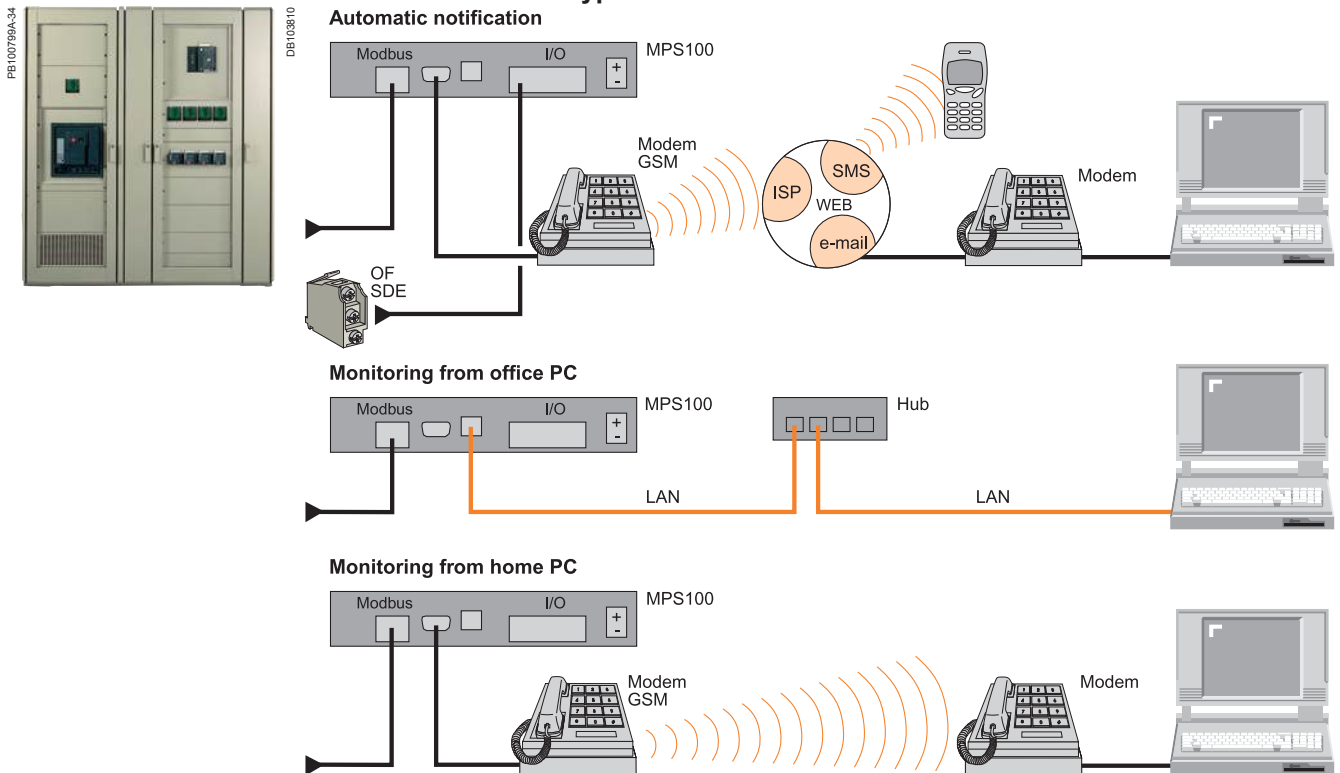
Main LV switchboard.



Monitoring of your main LV switchboard via embedded web pages in the MPS100 accessible with a standard web browser.



Typical architecture



It is possible to combine the different types of architecture.

Supported Modbus devices

- Micrologic trip units
 - Power Meters (PM700, PM800...).
- Maximum recommended connected devices is 10.

Features

- Access to the power system via a standard PC web browser
- Real-time data displayed with an intuitive and user friendly interface (dashboard)
- Ethernet Modbus TCP/IP connectivity directly to the LAN or via modem (Point to Point Protocol services)
- SMTP (Simple Mail Transfer Protocol) client (capacity to send e-mail)
- Local logging of data such as energy, power, current...
- Set-up and system configuration through MPS100 embedded HTML pages
- User interface translatable in any language, factory settings in English and French
- 6 inputs/2 outputs (no-volt contact)
- DHCP (Dynamic Host Configuration Protocol) client.

Technical characteristics

Power supply	24 V DC $\pm 15\%$, consumption = 250 mA
Operating temperature	0 to +50°C
Rugged compact metal housing	35 x 218 x 115 mm (H x W x D)
Additional information available at: http://194.2.245.4/mkt/microser.nsf	
User name: MPS, Password: MPS100	

Part numbers

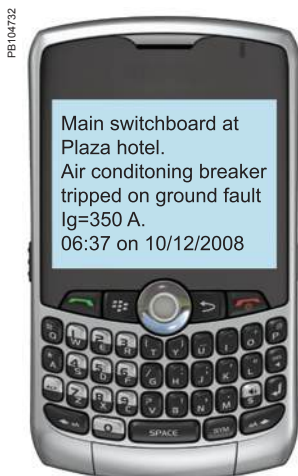
MPS100 Micro Power Server	33507
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Micrologic trip unit.



Power Meter.



Short Message Service (SMS).



Three types of connection are available:

- vertical or horizontal rear connection
- front connection (NT only)
- mixed connection.

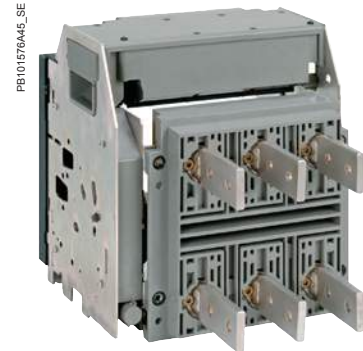
The solutions presented are similar in principle for all Masterpact NT and NW fixed and drawout devices.

Rear connection

Horizontal

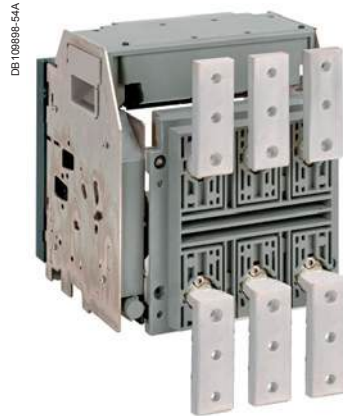


Vertical

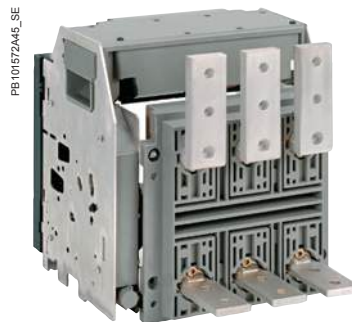


Simply turn a horizontal rear connector 90° to make it a vertical connector.

Front connection (NT only)



Mixed connection



Note: Masterpact circuit breakers can be connected indifferently with bare-copper, tinned-copper and tinned-aluminium conductors, requiring no particular treatment.



Accessories

Mounting on a switchboard backplate using special brackets

Masterpact NT fixed front-connected circuit breakers can be installed on a backplate without any additional accessories.

Masterpact NW circuit breakers require a set of special brackets.

Safety shutters V0

Mounted on the chassis, the safety shutters automatically block access to the disconnecting stabs when the device is in the disconnected or test positions. When the device is removed from its chassis, no live parts are accessible.

The shutter-locking system in front may be used to:

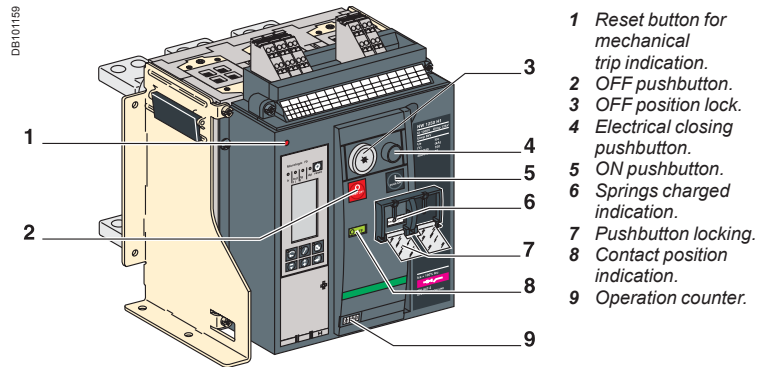
- prevents connection of the device
- locks the shutters in the closed position.

PB101954A80_SE





Locking On the device



- 1 Reset button for mechanical trip indication.
- 2 OFF pushbutton.
- 3 OFF position lock.
- 4 Electrical closing pushbutton.
- 5 ON pushbutton.
- 6 Springs charged indication.
- 7 Pushbutton locking.
- 8 Contact position indication.
- 9 Operation counter.



Access to pushbuttons protected by transparent cover.

Pushbutton locking VBP

The transparent cover blocks access to the pushbuttons used to open and close the device.

It is possible to independently lock the opening button and the closing button. The locking device is often combined with a remote operating mechanism.

The pushbuttons may be locked using either:

- three padlocks (not supplied)
- lead seal
- two screws.



Pushbutton locking using a padlock.

Device locking in the OFF position

By padlocks (VCPO option) - By keylocks (VSPO option)

The circuit breaker is locked in the OFF position by physically maintaining the opening pushbutton pressed down:

- using padlocks (one to three padlocks, not supplied)
- using keylocks (one or two different keylocks, supplied).

Keys may be removed only when locking is effective (Profalux or Ronis type locks).

The keylocks are available in any of the following configurations:

- one keylock
- one keylock mounted on the device + one identical keylock supplied separately for interlocking with another device
- two different key locks for double locking.

Profalux and Ronis keylocks are compatible with each other.

A locking kit (without locks) is available for installation of one or two keylocks (Ronis, Profalux, Kirk or Castell) not supplied.



OFF position locking using a padlock.

Accessory-compatibility

For Masterpact NT: 3 padlocks or 1 keylock

For Masterpact NW: 3 padlocks and/or 2 keylocks

Cable-type door interlock IPA

This option prevents door opening when the circuit breaker is closed and prevents circuit breaker closing when the door is open.

For this, a special plate associated with a lock and a cable is mounted on the right side of the circuit breaker.

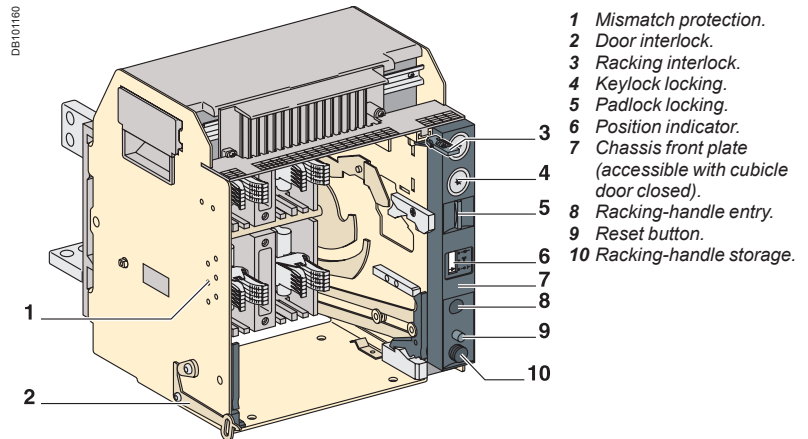
With this interlock installed, the source changeover function cannot be implemented.



OFF position locking using a keylock.



On the chassis



- 1 Mismatch protection.
- 2 Door interlock.
- 3 Racking interlock.
- 4 Keylock locking.
- 5 Padlock locking.
- 6 Position indicator.
- 7 Chassis front plate (accessible with cubicle door closed).
- 8 Racking-handle entry.
- 9 Reset button.
- 10 Racking-handle storage.



"Disconnected" position locking by padlocks.



"Disconnected" position locking by keylocks.

"Disconnected" position locking By padlocks (standard) or keylocks (VSPD option)

Mounted on the chassis and accessible with the door closed, these devices lock the circuit breaker in the "disconnected" position in two manners:

- using padlocks (standard), up to three padlocks (not supplied)
- using keylocks (optional), one or two different keylocks are available.

Profalux and Ronis keylocks are available in different options:

- one keylock
- two different keylocks for double locking
- one (or two) keylocks mounted on the device + one (or two) identical keylocks supplied separately for interlocking with another device.

A locking kit (without locks) is available for installation of one or two keylocks (Ronis, Profalux, Kirk or Castelli) not supplied.



Door interlock.

"Connected", "disconnected" and "test" position locking

The "connected", "disconnected" and "test" positions are shown by an indicator and are mechanically indexed. The exact position is obtained when the racking handle blocks. A release button is used to free it.

As standard, the circuit breaker can be locked only in "disconnected" position.

On request, the locking system may be modified to lock the circuit breaker in any of the three positions: "connected", "disconnected" or "test".

Door interlock catch VPEC

Mounted on the right or left-hand side of the chassis, this device inhibits opening of the cubicle door when the circuit breaker is in "connected" or "test" position. If the breaker is put in the "connected" position with the door open, the door may be closed without having to disconnect the circuit breaker.

Racking interlock VPOC

This device prevents insertion of the racking handle when the cubicle door is open.

Cable-type door interlock IPA

This option is identical for fixed and drawout versions.

Racking interlock IBPO between crank and OFF pushbutton for NW (standard)

This option makes it necessary to press the OFF pushbutton in order to insert the racking handle and holds the device open until the handle is removed.

Automatic spring discharge DAE before breaker removal for NW (standard)

This mechanism discharges the springs before the breaker is removed from the chassis.

Mismatch protection (standard) VDC

Mismatch protection ensures that a circuit breaker is installed only in a chassis with compatible characteristics. It is made up of two parts (one on the chassis and one on



Racking interlock.



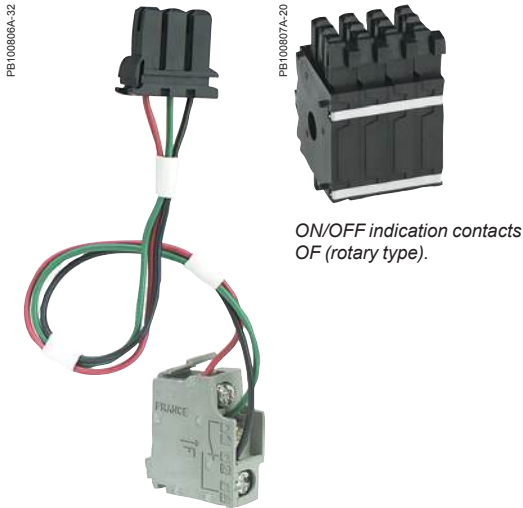
Mismatch protection.



Indication contacts are available:

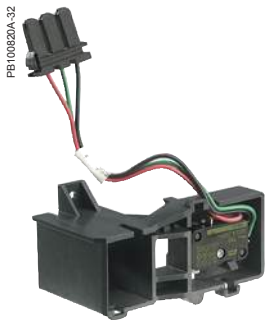
- in the standard version for relay applications
- in a low-level version for control of PLCs and electronic circuits.

M2C and M6C contacts may be programmed via the Micrologic P and H control units.

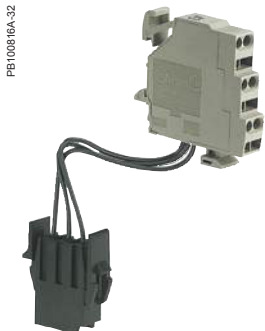


ON/OFF indication contacts OF (rotary type).

ON/OFF indication contacts OF (microswitch type)



Additional "fault-trip" indication contacts SDE.



Combined contacts.

ON/OFF indication contacts OF

Two types of contacts indicate the ON or OFF position of the circuit breaker:

- microswitch type changeover contacts for Masterpact NT
- rotary type changeover contacts directly driven by the mechanism for Masterpact NW. These contacts trip when the minimum isolation distance between the main circuit-breaker contacts is reached.

OF		NT	NW
Supplied as standard		4	4
Maximum number		4	12
Breaking capacity (A) p.f.: 0.3	Standard	Minimum load: 100 mA/24 V	
	V AC	240/380	6
		480	6
		600/690	6
	V DC	24/48	2.5
		240	0.5
		380	0.3
	Low-level	Minimum load: 2 mA/15 V	
	V AC	24/48	5
		240	5
		380	5
	V DC	24/48	5/2.5
		125	0.5
		250	0.3

"Fault-trip" indication contacts SDE

Circuit-breaker tripping due to a fault is signalled by:

- a red mechanical fault indicator (reset)
- one changeover contact SDE.

Following tripping, the mechanical indicator must be reset before the circuit breaker may be closed. One SDE is supplied as standard. An optimal SDE may be added. This latter is incompatible with the electrical reset after fault-trip option (Res).

SDE		NT/NW
Supplied as standard		1
Maximum number		2
Breaking capacity (A) p.f.: 0.3	Standard	Minimum load: 100 mA/24 V
	V AC	240/380
		480
		600/690
	V DC	24/48
		240
		380
	Low-level	Minimum load: 2 mA/15 V
	V AC	24/48
		240
		380
	V DC	24/48
		125
		250

Combined "connected/closed" contacts EF

The contact combines the "device connected" and the "device closed" information to produce the "circuit closed" information. Supplied as an option for Masterpact NW, it is mounted in place of the connector of an additional OF contact.

EF		NW
Maximum number		8
Breaking capacity (A) p.f.: 0.3	Standard	Minimum load: 100 mA/24 V
	V AC	240/380
		480
		600/690
	V DC	24/48
		125
		250
	Low-level	Minimum load: 2 mA/15 V
	V AC	24/48
		240
		380
	V DC	24/48
		125
		250



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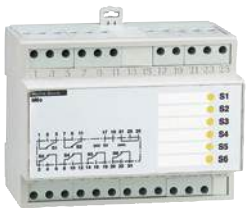
CCE, CD and CT "connected/disconnected/test" position carriage switches

PB100779A-52



M2C programmable contacts: circuit-breaker internal relay with two contacts.

PB100781A-32



M6C programmable contacts: circuit-breaker external relay with six independent changeover contacts controlled from the circuit breaker via a three-wire connection. (maximum length is 10 meters).

"Connected", "disconnected" and "test" position carriage switches

Three series of optional auxiliary contacts are available for the chassis:

- changeover contacts to indicate the "connected" position CE
- changeover contacts to indicate the "disconnected" position CD. This position is indicated when the required clearance for isolation of the power and auxiliary circuits is reached
- changeover contacts to indicate the "test" position CT. In this position, the power circuits are disconnected and the auxiliary circuits are connected.

Additional actuators

A set of additional actuators may be installed on the chassis to change the functions of the carriage switches.

Contacts		NT			NW			
		CE/CD/CT	CE/CD/CT	CE/CD/CT	CE/CD/CT	CE/CD/CT	CE/CD/CT	
Maximum number	Standard with additional actuators	3	2	1	3	3	3	
		9	0	0	9	0	0	
		6	3	0	6	3	0	
		6	0	3	6	0	3	
Breaking capacity (A) p.f.: 0.3	Standard	Minimum load: 100 mA/24 V						
		V AC	240	8	8	8	8	8
			380	8	8	8	8	8
			480	8	8	8	8	8
			600/690	6	6	6	6	6
		V DC	24/48	2.5	2.5	2.5	2.5	2.5
	125		0.8	0.8	0.8	0.8	0.8	
	Low-level	Minimum load: 2 mA/15 V						
		V AC	24/48	5	5	5	5	5
			240	5	5	5	5	5
			380	5	5	5	5	5
		V DC	24/48	2.5	2.5	2.5	2.5	2.5
125			0.8	0.8	0.8	0.8	0.8	
250	0.3	0.3	0.3	0.3	0.3	0.3		

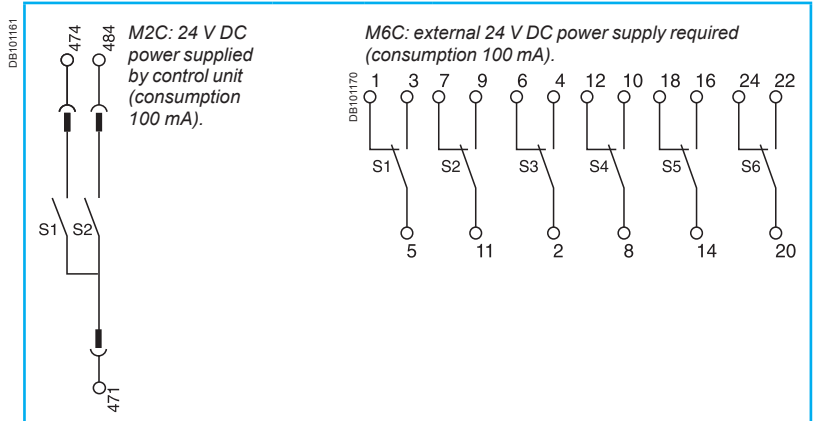
M2C / M6C programmable contacts

These contacts, used with the Micrologic P and H control units, may be programmed via the control unit keypad or via a supervisory station with the COM communication option. They require an external power supply module.

They indicate:

- the type of fault
- instantaneous or delayed threshold overruns.
- They may be programmed:
 - with instantaneous return to the initial state
 - without return to the initial state
 - with return to the initial state following a delay.

Characteristics		M2C/M6C	
Minimum load		100 mA/24 V	
Breaking capacity (A) p.f.: 0.7	V AC	240	5
	380	3	3
V DC	24	1.8	1.8
	48	1.5	1.5
	125	0.4	0.4
	250	0.15	0.15
	250	0.15	0.15





Remote operation

Remote ON / OFF

Two solutions are available for remote operation of Masterpact devices:

- a point-to-point solution
- a bus solution with the COM communication option.

The remote ON / OFF function is used to remotely open and close the circuit breaker. It is made up of:

- an electric motor MCH equipped with a “springs charged” limit switch contact CH
- two voltage releases:
 - a closing release XF
 - an opening release MX.

Optionally, other functions may be added:

- a “ready to close” contact PF
- an electrical closing pushbutton BPFE
- remote reset following a fault RES.

A remote-operation function is generally combined with:

- device ON / OFF indication OF
- “fault-trip” indication SDE.



Note: an opening order always takes priority over a closing order.

If opening and closing orders occur simultaneously, the mechanism discharges without any movement of the main contacts. The circuit breaker remains in the open position (OFF).

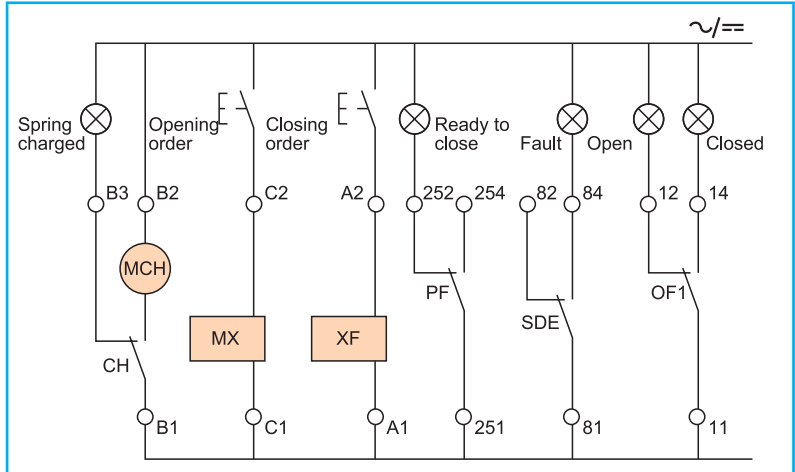
In the event of maintained opening and closing orders, the standard mechanism provides an anti-pumping function by blocking the main contacts in open position.

Anti-pumping function. After fault tripping or intentional opening using the manual or electrical controls, the closing order must first be discontinued, then reactivated to close the circuit breaker.

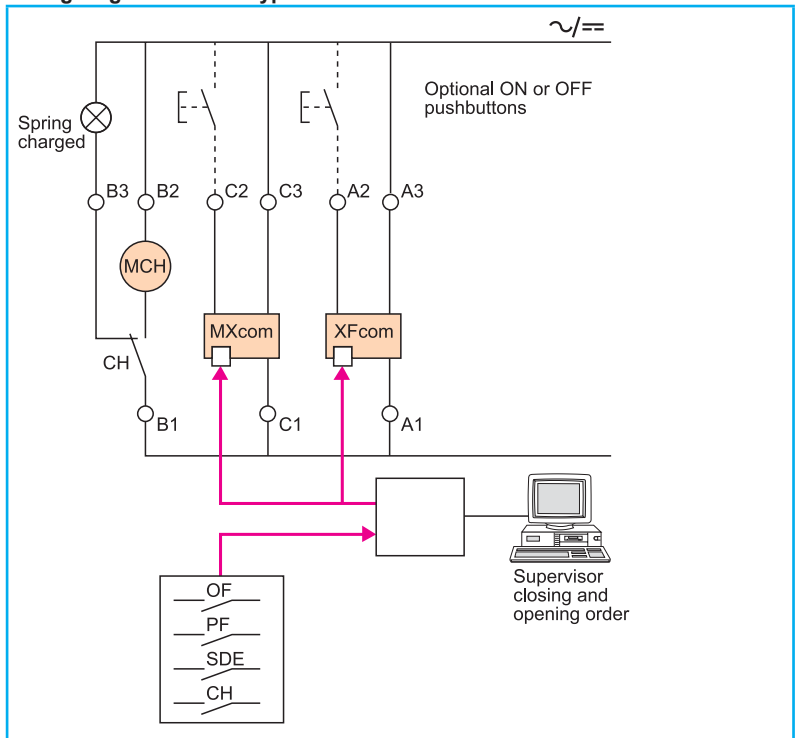
Note: MX communicating releases are of the impulse type only and cannot be used to lock a circuit breaker in OFF position. For locking in OFF position, use the remote tripping function (2nd MX or MN).

When MX or XF communicating releases are used, the third wire (C3, A3) must be connected even if the communication module is not installed. When the control voltage (C3-C1 or A3-A1) is applied to the MX or XF releases, it is necessary to wait 1.5 seconds before issuing an order. Consequently, it is advised to use standard MX or XF releases for applications such as source-changeover systems.

Wiring diagram of a point-to-point remote ON / OFF function



Wiring diagram of a bus-type remote ON / OFF function





PBE100797A-23



Electric motor MCH for Masterpact NT.

PBE100808A-32



Electric motor MCH for Masterpact NW.

Electric motor MCH

The electric motor automatically charges and recharges the spring mechanism when the circuit breaker is closed. Instantaneous reclosing of the breaker is thus possible following opening. The spring-mechanism charging handle is used only as a backup if auxiliary power is absent.

The electric motor (MCH) is equipped as standard with a limit switch contact (CH) that signals the “charged” position of the mechanism (springs charged).

Characteristics

Power supply	V AC 50/60 Hz	48-60, 100-130, 200-250, 277-415, 380-415, 440-480
	V DC	24-30, 48-60, 100-130, 200-250
Operating threshold	0.85 to 1.1 Un	
Consumption (VA or W)	180	
Motor overcurrent	2 to 3 In for 0.1 s	
Charging time	maximum 3 s for Masterpact NT	
	maximum 4 s for Masterpact NW	
Operating frequency	maximum 3 cycles per minute	
CH contact	10 A at 240 V	

Voltage releases XF and MX

Their supply can be maintained or automatically disconnected.

Closing release XF

The XF release remotely closes the circuit breaker if the spring mechanism is charged.

Opening release MX

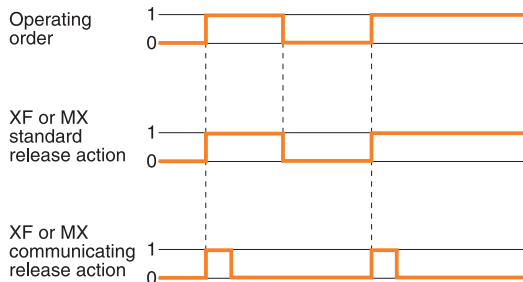
The MX release instantaneously opens the circuit breaker when energised. It locks the circuit breaker in OFF position if the order is maintained (except for MX “communicating” releases).

Note: whether the operating order is maintained or automatically disconnected (pulse-type), XF or MX “communicating” releases (“bus” solution with “COM” communication option) always have an impulse-type action (see diagram).

Characteristics

	XF	MX1
Power supply	V AC 50/60 Hz	24, 48, 100-130, 200-250, 277, 380/480
	V DC	12, 24-30, 48-60, 100-130, 200-250
Operating threshold	0.85 to 1.1 Un	0.7 to 1.1 Un
Consumption (VA or W)	Hold: 4.5	Hold: 4.5
	Pick-up: 200 (200 ms)	Pick-up: 200 (200 ms)
Circuit-breaker response time at Un	55 ms ±10 (Masterpact NT)	50 ms ±10
	70 ms ±10 (NW ≤ 4000A)	
	80 ms ±10 (NW > 4000A)	

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XF and MX voltage releases.

“Ready to close” contact PF

The “ready to close” position of the circuit breaker is indicated by a mechanical indicator and a PF changeover contact. This signal indicates that all the following are valid:

- the circuit breaker is in the OFF position
- the spring mechanism is charged
- a maintained opening order is not present:
 - MX energised
 - fault trip
 - remote tripping (second MX or MN)
 - device not completely racked in
 - device locked in OFF position
 - device interlocked with a second device.

Characteristics

	NT/NW	
Maximum number	1	
Breaking capacity (A) p.f.: 0.3	Standard	Minimum load: 100 mA/24 V
		V AC 240/380 5
		480 5
		600/690 3
	Low-level	V DC 24/48 3
		125 0.3
		250 0.15
	Low-level	Minimum load: 2 mA/15 V
		V AC 24/48 3
		240 3
		380 3
		V DC 24/48 3
		125 0.3
	250 0.15	

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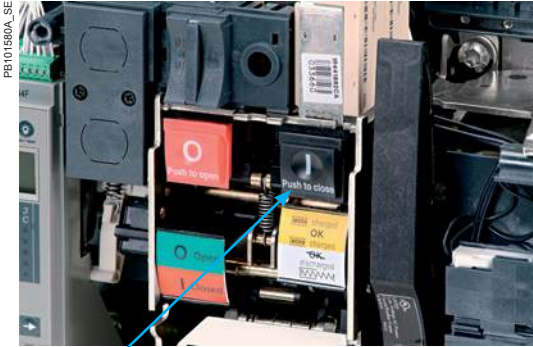


“Ready to close” contacts PF.



Remote operation

Remote ON/OFF



Electrical closing pushbutton (BPFE).

Electrical closing pushbutton BPFE

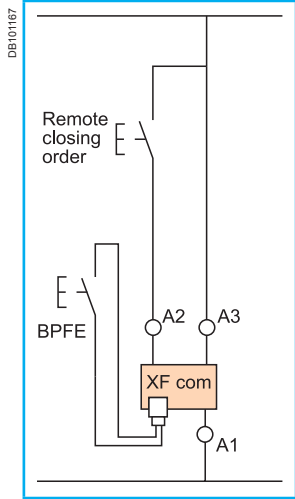
Located on the front panel, this pushbutton carries out electrical closing of the circuit breaker. It is generally associated with the transparent cover that protects access to the closing pushbutton.

Electrical closing via the BPFE pushbutton takes into account all the safety functions that are part of the control/monitoring system of the installation.

The BPFE connects to the closing release XF in place of the COM module.

The COM module is incompatible with this option;

Different types of voltage exist and the XF electromagnet is compulsory if the BPFE option is selected.



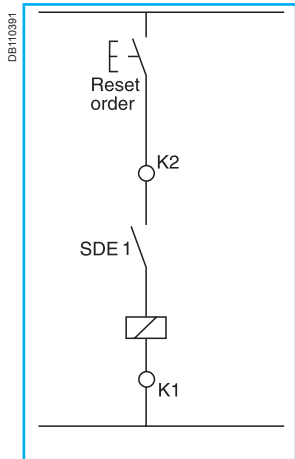
Remote reset after fault trip

Electrical reset after fault trip RES

Following tripping, this function resets the “fault trip” indication contacts SDE and the mechanical indicator and enables circuit breaker closing.

Power supply: 110 / 130 V AC and 200 / 240 V AC.

The use of a XF closing release is compulsory with this option.



Automatic reset after fault trip RAR

Following tripping, a reset of the mechanical indicator (reset button) is no longer required to enable circuit-breaker closing. The mechanical (reset button) and electrical SDE indications remain in fault position until the reset button is pressed. The use of a XF closing release is compulsory with this option.



Remote tripping



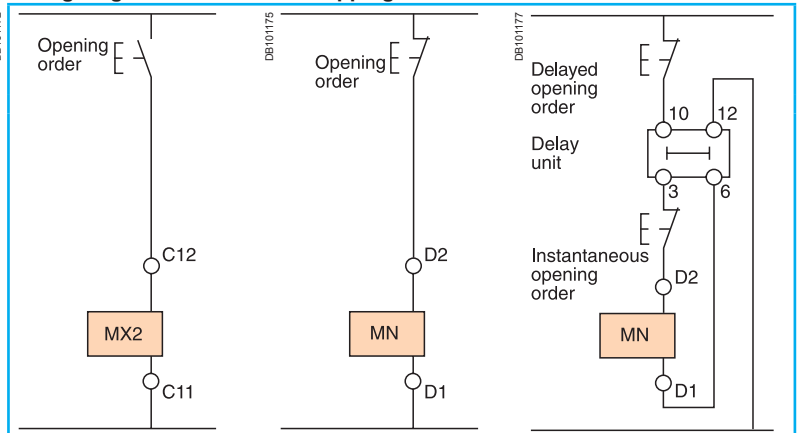
MX or MN voltage release.

This function opens the circuit breaker via an electrical order. It is made up of:

- a shunt release second MX
- or an undervoltage release MN
- or a delayed undervoltage release (MN + delay unit).

These releases (2nd MX or MN) cannot be operated by the communication bus. The delay unit, installed outside the circuit breaker, may be disabled by an emergency OFF button to obtain instantaneous opening of the circuit breaker.

Wiring diagram for the remote-tripping function



Voltage releases second MX

When energised, the MX voltage release instantaneously opens the circuit breaker. A continuous supply of power to the second MX locks the circuit breaker in the OFF position.

Characteristics

Power supply	V AC 50/60Hz	24, 48, 100-130, 200-250, 277, 380/480
	V DC	12, 24-30, 48-60, 100-130, 200-250
Operating threshold		0.7 to 1.1 Un
Permanent locking function		0.85 to 1.1 Un
Consumption (VA or W)	Pick-up: 200 (80 ms)	Hold: 4.5
Circuit-breaker response time at Un	50 ms ±10	

Instantaneous voltage releases MN

The MN release instantaneously opens the circuit breaker when its supply voltage drops to a value between 35 % and 70 % of its rated voltage. If there is no supply on the release, it is impossible to close the circuit breaker, either manually or electrically. Any attempt to close the circuit breaker has no effect on the main contacts. Circuit-breaker closing is enabled again when the supply voltage of the release returns to 85 % of its rated value.

Characteristics

Power supply	V AC 50/60 Hz	24, 48, 100-130, 200-250, 277, 380/480
	V DC	12, 24-30, 48-60, 100-130, 200-250
Operating threshold	Opening	0.35 to 0.7 Un
	Closing	0.85 Un
Consumption (VA or W)	Pick-up: 200 (200 ms)	Hold: 4.5
MN consumption with delay unit (VA or W)	Pick-up: 200 (200 ms)	Hold: 4.5
Circuit-breaker response time at Un		40 ms ±5 for NT
		90 ms ±5 for NW

MN delay units

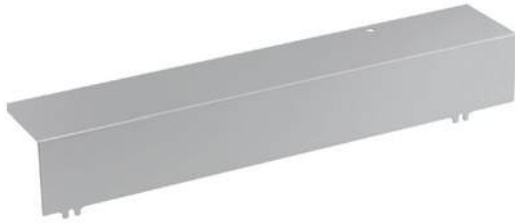
To eliminate circuit-breaker nuisance tripping during short voltage dips, operation of the MN release can be delayed. This function is achieved by adding an external delay unit in the MN voltage-release circuit. Two versions are available, adjustable and non-adjustable.

Characteristics

Power supply	Non-adjustable	100-130, 200-250
	Adjustable	48-60, 100-130, 200-250, 380/480
Operating threshold	Opening	0.35 to 0.7 Un
	Closing	0.85 Un
Consumption of delay unit	Pick-up: 200 (200 ms)	Hold: 4.5
Circuit-breaker response time at Un	Non-adjustable	0.25 s
	Adjustable	0.5 s - 0.9 s - 1.5 s - 3 s



PB104740



Auxiliary terminal shield CB

Optional equipment mounted on the chassis, the shield prevents access to the terminal block of the electrical auxiliaries.

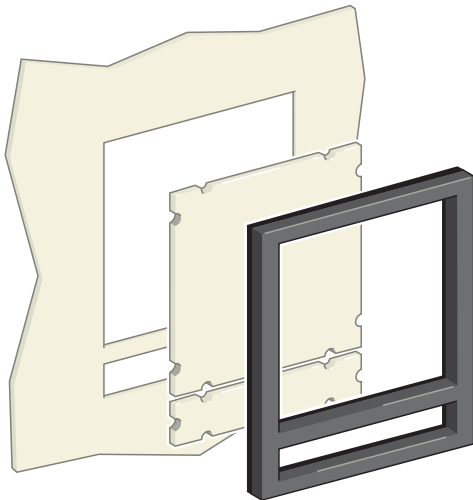
PB104382A32



Operation counter CDM

The operation counter sums the number of operating cycles and is visible on the front panel. It is compatible with manual and electrical control functions.

DB101173



Escutcheon CDP

Optional equipment mounted on the door of the cubicle. The escutcheon increases the degree of protection to IP 40 (circuit breaker installed free standing: IP30). It is available in fixed and drawout versions.

Blanking plate OP for escutcheon

Used with the escutcheon, this option closes off the door cut-out of a cubicle not yet equipped with a device. It may be used with the escutcheon for both fixed and drawout devices.

Transparent cover CCP for escutcheon

Optional equipment mounted on the escutcheon, the cover is hinged and secured by a screw. It increases the degree of protection to IP54, IK10. It adapts to drawout devices.

Escutcheon CDP with blanking plate.

PB10076A-42



Transparent cover CCP for escutcheon.

Source-changeover systems Presentation



PB100845A



Manual source-changeover system

A manual source-changeover system is made up of:

- two circuit-breakers or automatic switches operated by connecting rods or two or three circuit-breakers or automatic switches operated by cables
- a mechanical interlocking system using connecting rods or cables.

PB100844A



Service sector:

- hospital operating rooms
- safety systems for tall buildings
- computer rooms (banks, insurance companies, etc.)
- lighting systems in shopping centres.

PB100845A



Industry:

- assembly lines
- propulsion systems on ships
- essential auxiliaries in thermal power stations...

PB100846A



PB100847A



Infrastructure:

- port and railway installations
- runway lighting systems
- control systems for military installations...



Mechanical interlocking enhances the reliability of the source-changeover system.



Interlocking of two Masterpact circuit breakers using cables.

Interlocking of two Masterpact devices using cables

To ensure a continuous supply of electrical power, certain installations are connected to two sources:

- a normal source N
- a replacement source R used to supply the installation when the normal source is unavailable.

A source-changeover system switches the load between these two sources. It can be automated to manage transfers according to external conditions. A source-changeover system includes two or three circuit breakers or automatic switches.

Interlocking of two Masterpact devices using connecting rods

The two devices must be mounted one above the other.

This function requires:

- an adaptation fixture on the right side of each circuit breaker or automatic switch
- a set of connecting rods with no-slip adjustments.

The adaptation fixtures, connecting rods and circuit breakers or automatic switches are supplied separately, ready for assembly.

The maximum vertical distance between the fixing planes is 900 mm.

Possible combinations of Masterpact "Normal" and "Replacement" source circuit breakers

Devices to be interlocked		NT		NW	
		Fixed	Drawout	Fixed	Drawout
NT	Fixed	■	-	-	-
	Drawout	-	■	-	-
NW	Fixed	-	-	■	■
	Drawout	-	-	■	■

Interlocking of two or three Masterpact devices using cables

For cable interlocking, the circuit breakers may be mounted one above the other or side-by-side.

Interlocking between two devices (Masterpact NT or NW)

This function requires:

- an adaptation fixture on the right side of each circuit breaker or automatic switch
- a set of cables with no-slip adjustments.

The maximum distance between the fixing planes (vertical or horizontal) is 2000 mm with a radius of curvature of at least 100 mm.

For longer distances, please consult us.

Interlocking between three devices (Masterpact NW only)

This function requires:

- a specific adaptation fixture for each type of interlocking, installed on the right side of each circuit breaker or automatic switch
- two or three sets of cables with no-slip adjustments.

The maximum distance between the fixing planes (vertical or horizontal) is 2000 mm with a radius of curvature of at least 100 mm.

For longer distances, please consult us.

Installation

The adaptation fixtures, sets of cables and circuit breakers or automatic switches are supplied separately, ready for assembly.

Possible combinations of Masterpact "Normal" and "Replacement" source circuit breakers

All combinations of Masterpact NT and Masterpact NW devices are possible.

The interlocked devices can be fixed, drawout, 3-pole or 4-pole versions with different ratings and sizes.



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Last but not least, they optimise use of our products while also complying with standards and proper procedures.

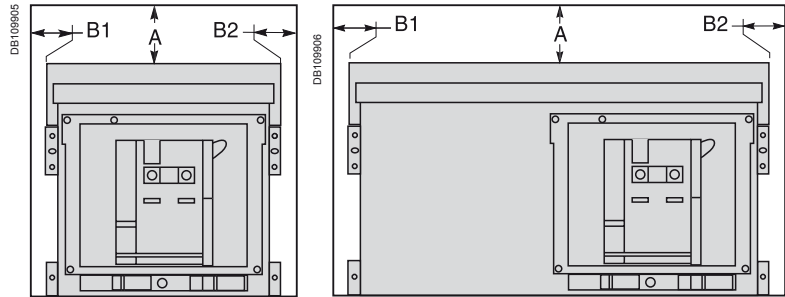




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Space requirements



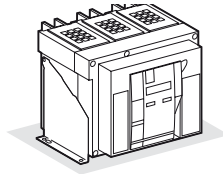
Minimum space	UL 489 Listed			
	A		B1 + B2	
	inch	mm	inch	mm
Insulated parts	0	0	0	0
Metal parts	0	0	4.36	111

Installation in switchboard

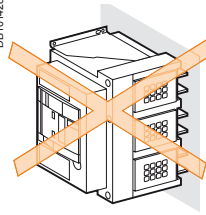


Possible positions

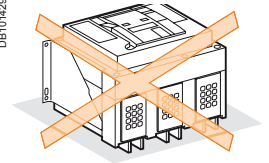
DB101427



DB101428



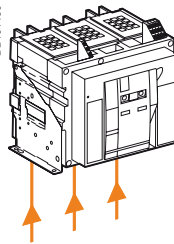
DB101429



Power supply

Masterpact devices can be supplied either from the top or from the bottom without reduction in performance, in order to facilitate connection when installed in a switchboard.

DB101430



Mounting the circuit-breaker

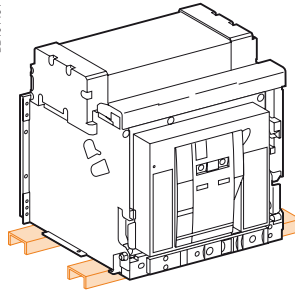
It is important to distribute the weight of the device uniformly over a rigid mounting surface such as rails or a base plate.

This mounting plane should be perfectly flat (tolerance on support flatness: 2 mm).

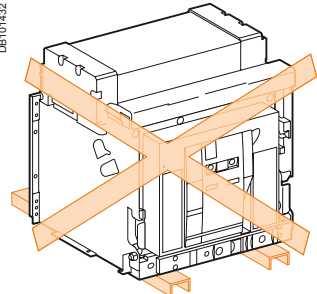
This eliminates any risk of deformation which could interfere with correct operation of the circuit breaker.

Masterpact devices can also be mounted on a vertical plane using the special brackets.

DB101431

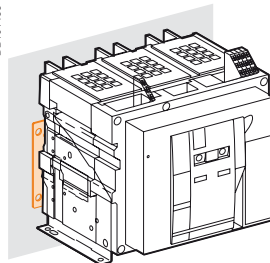


DB101432



Mounting on rails.

DB101433



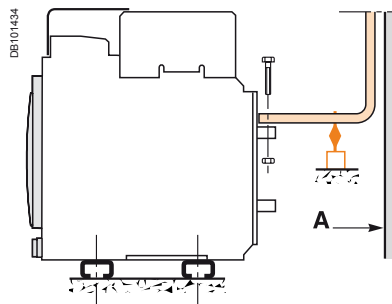
Mounting with vertical brackets.



Partitions

Sufficient openings must be provided in partitions to ensure good air circulation around the circuit breaker; Any partition between upstream and downstream connections of the device must be made of non-magnetic material.

For high currents, of 2500 A and upwards, the metal supports or barriers in the immediate vicinity of a conductor must be made of non-magnetic material **A**. Metal barriers through which a conductor passes must not form a magnetic loop.

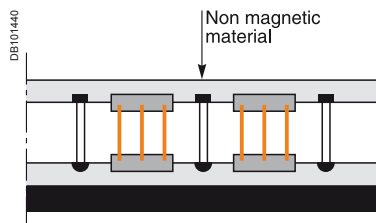


A : non magnetic material.



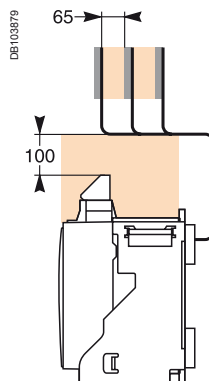
Busbars (NT, NW)

The mechanical connection must exclude the possibility of formation of a magnetic loop around a conductor.



Busbars (NT)

For live busbars installed immediately above the circuit breaker (respecting the 100 mm safety clearance), the distance between bars must be 65 mm minimum. In a 1000 V system, the bars must be insulated.



Door interlock

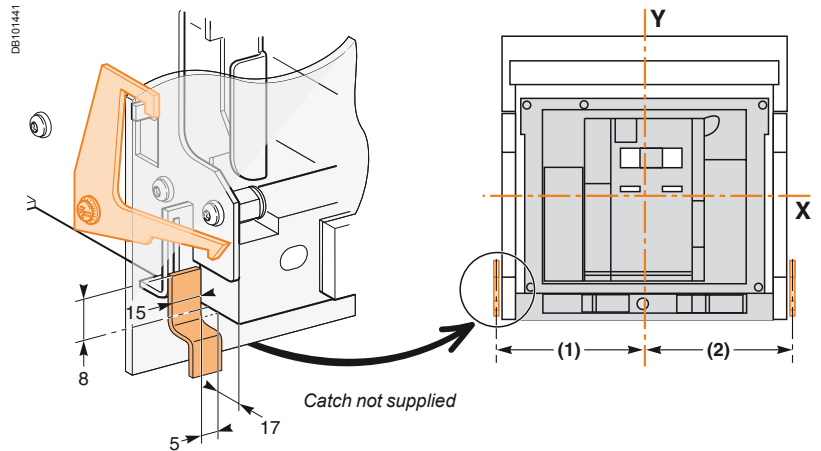


Door interlock

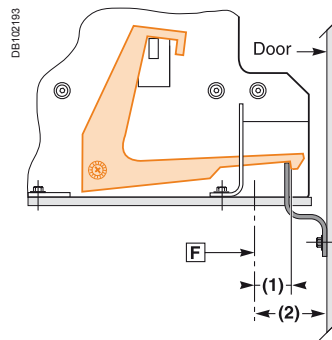
Mounted on the right or left-hand side of the chassis, this device inhibits opening of the cubicle door when the circuit breaker is in "connected" or "test" position. If the breaker is put in the "connected" position with the door open, the door may be closed without having to disconnect the circuit breaker.

Dimensions (mm)

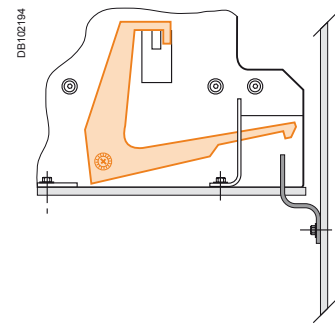
Type	(1)	(2)
NT08-12 (3P)	135	168
NT08-12 (4P)	205	168
NW08-30 (3P)	215	215
NW08-30 (4P)	330	215
NW40-50 (3P)	660	215
NW40-50 (4P)	775	215



Breaker in "connected" or "test" position
Door cannot be opened



Breaker in "disconnected" position
Door can be opened



Dimensions (mm)

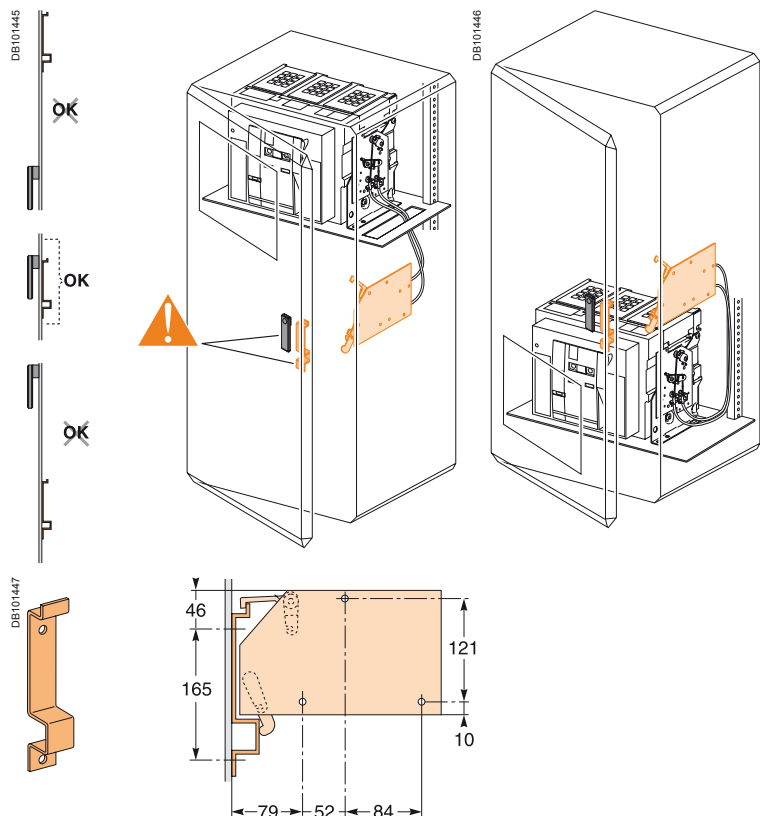
Type	(1)	(2)
NT	5	23
NW	83	103

Cable-type door interlock

This option prevents door opening when the circuit breaker is closed and prevents circuit breaker closing when the door is open.

For this, a special plate associated with a lock and a cable is mounted on the right side of the circuit breaker.

With this interlock installed, the source changeover function cannot be implemented.



Note: the door interlock can either be mounted on the right side or the left side of the breaker.

F: datum.



Control wiring

Wiring of voltage releases

During pick-up, the power consumed is approximately 150 to 200 VA. For low control voltages (12, 24, 48 V), maximum cable lengths are imposed by the voltage and the cross-sectional area of cables.

Recommended maximum cable lengths (meter)

		12 V		24 V		48 V	
		2.5 mm ²	1.5 mm ²	2.5 mm ²	1.5 mm ²	2.5 mm ²	1.5 mm ²
MN	U source 100 %	-	-	58	35	280	165
	U source 85 %	-	-	16	10	75	45
MX-XF	U source 100 %	21	12	115	70	550	330
	U source 85 %	10	6	75	44	350	210

Note: the indicated length is that of each of the two wires.

24 V DC power-supply module

External 24 V DC power-supply module for Micrologic (F1-, F2+)

(see [page D-2](#) and [page D-4](#))

- Do not connect the positive terminal (F2+) to earth
- The negative terminal (F1-) can be connected to earth, except in IT systems
- A number of Micrologic control units and M6C modules can be connected to the same 24 V DC power supply (the consumption of a Micrologic control unit or an M6C module is approximately 100 mA)
- Do not connect any devices other than a Micrologic control unit or an M6C module
- The maximum length for each conductor is ten metres. For greater distances, it is advised to twist the supply wires together
- The 24 V DC supply wires must cross the power cables perpendicularly. If this is difficult, it is advised to twist the supply wires together
- The technical characteristics of the external 24 V DC power-supply module for Micrologic control units are indicated on [page A-20](#).

Communication bus

- Do not connect the positive terminal (E1) to earth
- The negative terminal (E2) can be connected to earth
- A number of "device" or "chassis" communication modules can be connected to the same 24 V DC power supply (the consumption of each module is approximately 30 mA)
- The 24 V DC (E1, E2) power supply for the communication bus must be separate from the external 24 V DC power-supply module for Micrologic control units (F1-, F2+).

E1	E2	E3	E4	E5	E6+
+	-	A/Tx ⁻	B/Tx ⁺	A'/Rx ⁻	B'/Rx ⁺

To create a two-wire Modbus communication bus, simply connect Tx⁻ with Rx⁻ and Tx⁺ with Rx⁺.

To connect a Modbus slave (Micrologic) to a Modbus master (PLC), connect:
 the slave Tx⁻ to the master Rx⁻ the slave Rx⁻ to the master Tx⁻
 the slave Tx⁺ to the master Rx⁺ the slave Rx⁺ to the master Tx⁺.

RS 485 Modbus Junction Block

Pins	Signal	Color
1	0 V	Black
2	24 V	Red
3	NC	
4	B' / Rx ⁺	Blue
5	B / Tx ⁺	Yellow
6	0 V	Black
7	24 V	Red
8	A' / Rx ⁻	White
9	A / Tx ⁻	Brown

Wiring of ZSI: It is recommended to use twisted shielded cable. The shield must be connected to earth at both ends.

Power connection

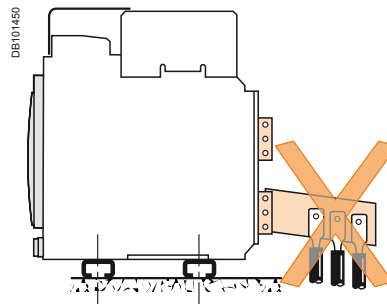
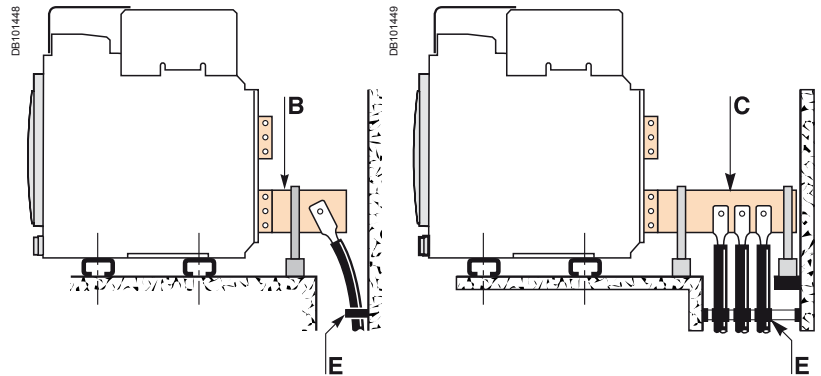


Cable connections

If cables are used for the power connections, make sure that they do not apply excessive mechanical forces to the circuit breaker terminals.

For this, make the connections as follows:

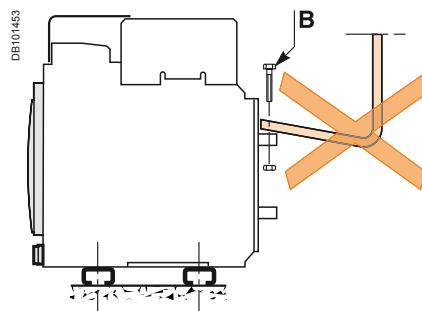
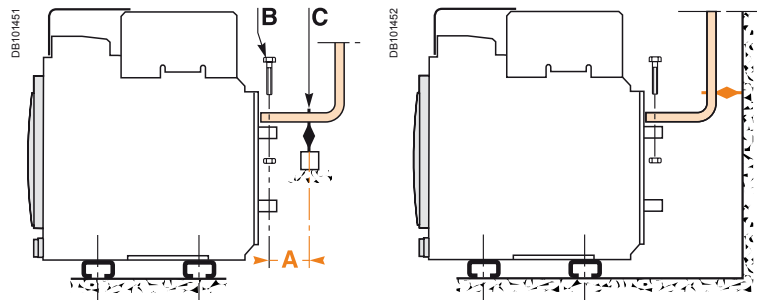
- extend the circuit breaker terminals using short bars designed and installed according to the recommendations for bar-type power connections:
 - for a single cable, use solution **B** opposite
 - for multiple cables, use solution **C** opposite.
- in all cases, follow the general rules for connections to busbars:
 - position the cable lugs before inserting the bolts
 - the cables should firmly secured to the framework **E**.



Busbar connections

The busbars should be suitably adjusted to ensure that the connection points are positioned on the terminals before the bolts are inserted **B**.

The connections are held by the support which is solidly fixed to the framework of the switchboard, such that the circuit breaker terminals do not have to support its weight **C**. (This support should be placed close to the terminals).

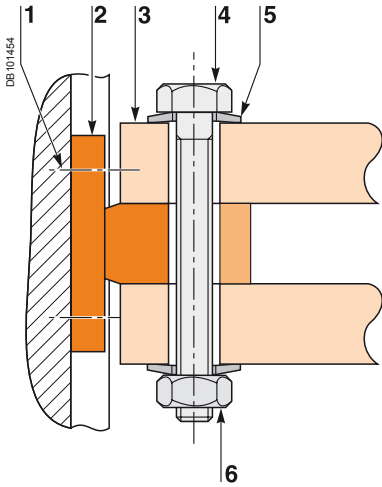


Electrodynamic stresses

The first busbar support or spacer shall be situated within a maximum distance from the connection point of the breaker (see table below). This distance must be respected so that the connection can withstand the electrodynamic stresses between phases in the event of a short circuit.

Maximum distance A between busbar to circuit breaker connection and the first busbar support or spacer with respect to the value of the prospective short-circuit current

Icc (kA)	30	50	65	80	100	150
Distance A (mm)	350	300	250	150	150	150



- 1 Terminal screw factory-tightened to 16 Nm (NW), 13 Nm (NT).
- 2 Breaker terminal.
- 3 Busbar.
- 4 Bolt.
- 5 Washer.
- 6 Nut.

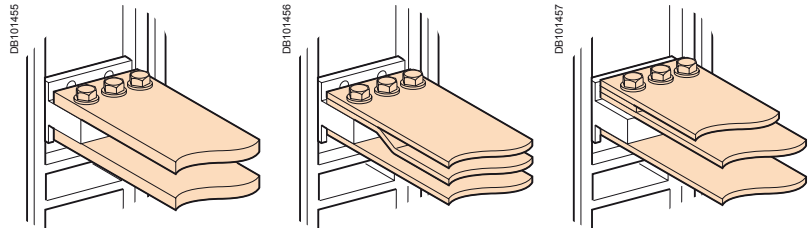
Clamping

Correct clamping of busbars depends amongst other things, on the tightening torques used for the nuts and bolts. Over-tightening may have the same consequences as under-tightening.

For connecting busbars (Cu ETP-NFA51-100) to the circuit breaker, the tightening torques to be used are shown in the table below.

These values are for use with copper busbars and steel nuts and bolts, class 8.8. The same torques can be used with AGS-T52 quality aluminium bars (French standard NFA 02-104 or American National Standard H-35-1).

Examples

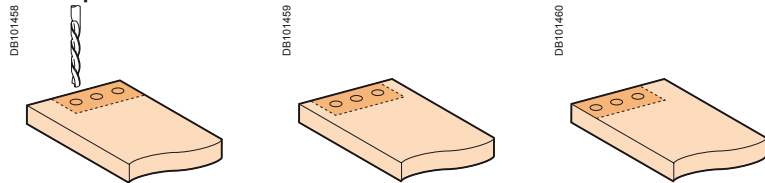


Tightening torques

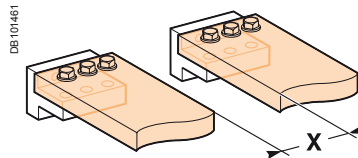
Ø (mm) Nominal	Ø (mm) Drilling	Tightening torques (Nm) with grower or flat washers	Tightening torques (Nm) with contact or corrugated washers
10	11	37.5	50

Busbar drilling

Examples



Isolation distance

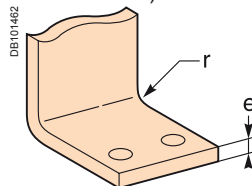


Dimensions (mm)

Ui	X min
600 V	8 mm
1000 V	14 mm

Busbar bending

When bending busbars maintain the radius indicated below (a smaller radius would cause cracks).



Dimensions (mm)

e	Radius of curvature (r)	
	Min	Recommended
5	5	7.5
10	15	18 to 20



Selection table fixed Masterpact NT/NW

Installation recommendations

The requirements for the connectors and connection bars are shown in the table below.

Note: the installer is responsible for the connection of the bars to the circuit breaker connectors. The bars must be supported by the switchboard framework, with no weight on the connectors.

Bar dimensions

Circuit breaker		Standard	Connector	Connection bars	
Rating (A)	Type			Number	Dimensions
800, 1200	N/H/L1/HF	UL 489	RC-H, RC-V, FC	1	0.25 x 3 in. (6 x 76 mm)
1600	N/H/HF	UL 489	RC-H, RC-V, FC	2	0.25 x 3 in. (6 x 76 mm)
2000	N/H/HF	UL 489	RC-H	3	0.25 x 3 in. (6 x 76 mm)
			RC-V	2	0.25 x 4 in. (6 x 102 mm)
2500	H/HF	UL 489	RC-H	5	0.25 x 3 in. (6 x 76 mm)
			RC-V	2	0.25 x 5 in. (6 x 127 mm)
3000	H/HF	UL 489	RC-H	8	0.25 x 3 in. (6 x 76 mm)
			RC-V	4	0.25 x 4 in. (6 x 102 mm)
4000	H/HF	UL 489	RC-H	4	0.25 x 6 in. (6 x 152 mm)
			RC-V	4	0.25 x 5 in. (6 x 127 mm)
5000	H/HF	UL 489	RC-H	8	0.25 x 6 in. (6 x 152 mm)
			RC-V	6	0.25 x 5 in. (6 x 127 mm)

RC-H: horizontal rear connection.

RC-V: vertical rear connection.

FC: front connection.

Note: FC for Masterpact NT only.



Power connection

Selection table

drawout Masterpact NT/NW

Installation recommendations

The requirements for the connectors and connection bars are shown in the table below.

Note: the installer is responsible for the connection of the bars to the circuit breaker connectors. The bars must be supported by the switchboard framework, with no weight on the connectors.

Bar dimensions

Circuit breaker		Standard	Connector	Connection bars	
Rating (A)	Type			Number	Dimensions
800,1200	N/H/L1/HF	UL 489	RC-H, RC-V, FC	1	0.25 x 3 in. (6 x 76 mm)
1600	N/H/L1/HF	UL 489	RC-H, RC-V, FC	2	0.25 x 3 in. (6 x 76 mm)
2000	N/H/HF	UL 489	RC-H	3	0.25 x 3 in. (6 x 76 mm)
			RC-V	2	0.25 x 4 in. (6 x 102 mm)
2500	H/HF	UL 489	RC-H	5	0.25 x 3 in. (6 x 76 mm)
			RC-V	2	0.25 x 5 in. (6 x 127 mm)
3000	H/HF	UL 489	RC-H	8	0.25 x 3 in. (6 x 76 mm)
			RC-V	4	0.25 x 4 in. (6 x 102 mm)
4000	H/HF	UL 489	RC-H	4	0.25 x 6 in. (6 x 152 mm)
			RC-V	4	0.25 x 5 in. (6 x 127 mm)
5000	H/HF	UL 489	RC-H	8	0.25 x 6 in. (6 x 152 mm)
			RC-V	6	0.25 x 5 in. (6 x 127 mm)

RC-H: horizontal rear connection.

RC-V: vertical rear connection.

FC: front connection.

Note: FC for Masterpact NT only.



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The training catalogue includes beginner's courses in electrical distribution, knowledge of MV and LV switchgear, operation and maintenance of installations, design of LV installations to give but a few examples.

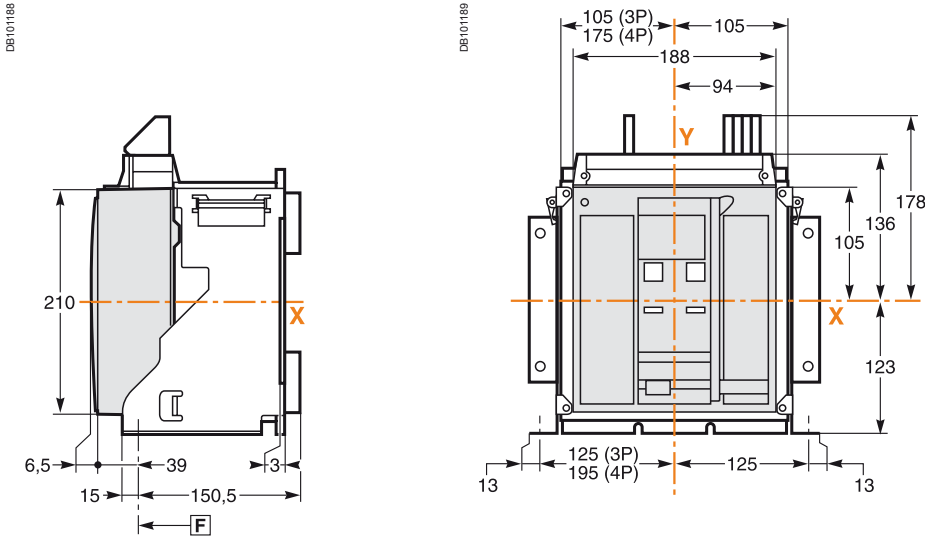




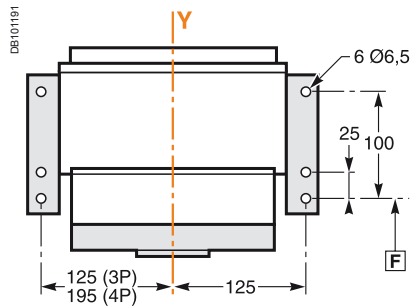
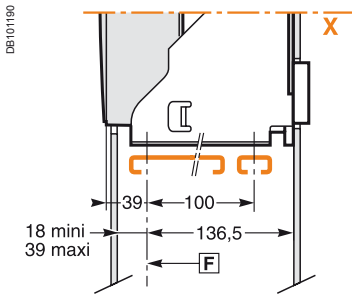
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<i>Functions and characteristics</i>	A-1
<i>Installation recommendations</i>	B-1
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Fixed 4-pole device	C-6
Drawout 3/4-pole device	C-10
Drawout 3-pole device	C-11
Drawout 4-pole device	C-14
NW08 to NW30 circuit breakers	
Fixed 3/4-pole device	C-18
Fixed 3-pole device	C-19
Fixed 4-pole device	C-22
Drawout 3/4-pole device	C-26
Drawout 3-pole device	C-27
Drawout 4-pole device	C-30
NW40 and NW50 circuit breakers	
Fixed 3/4-pole device	C-34
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NT/NW external modules	C-48
<i>Electrical diagrams</i>	D-1
<i>Additional characteristics</i>	E-1
<i>Catalogue numbers</i>	F-1



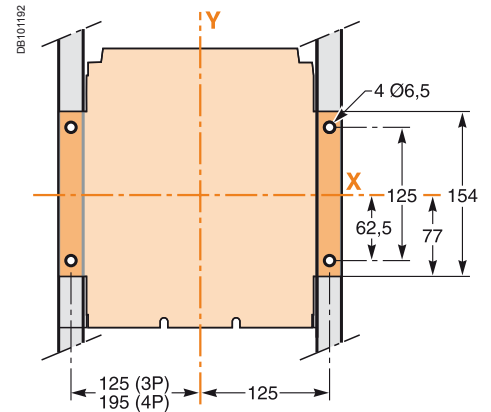
Dimensions



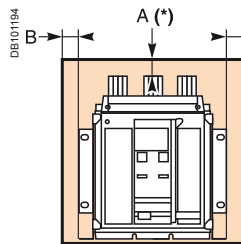
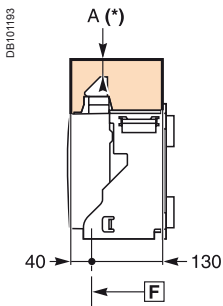
Bottom mounting (on base plate or rails)



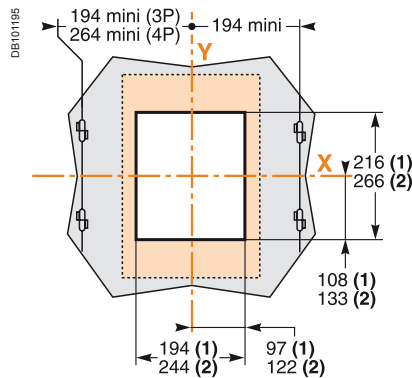
Rear mounting detail (on upright or backplate)



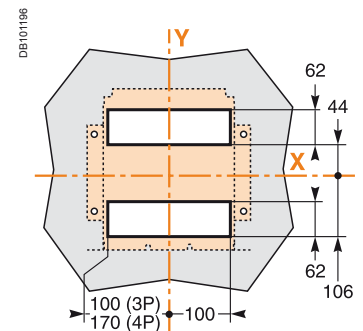
Safety clearances



Door cutout



Rear panel cutout



For voltages < 690 V

	Parts		
	Insulated	Metal	Energised
A	0	0	100
B	0	0	60

For 1000 V

	Parts		
	Insulated	Metal	Energised
A	0	100	500 ⁽³⁾
B	0	50	100 ⁽³⁾

F: datum.

(1) Without escutcheon.
(2) With escutcheon.

Note: dimensions in mm.

(3) With a minimum distance between bars of 65 mm (A and B) if the bars are not insulated.

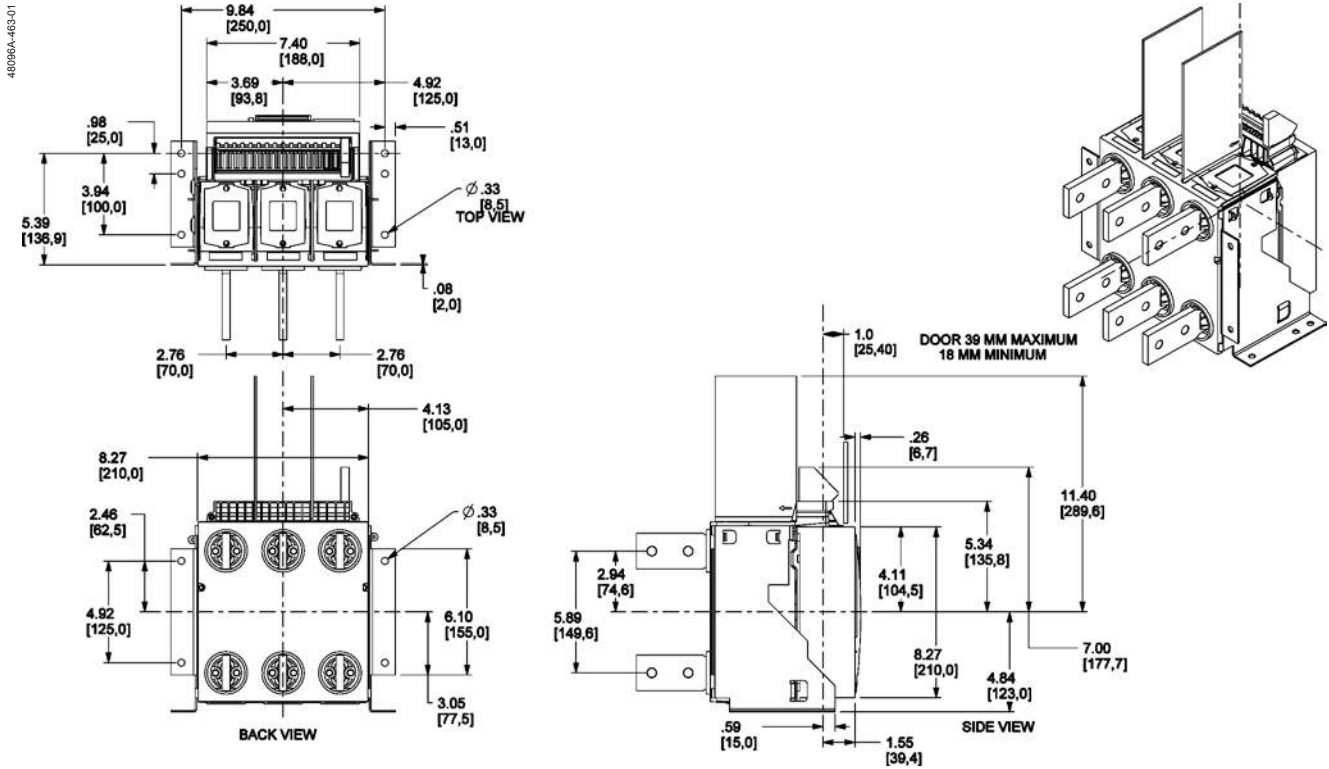
Note: X and Y are the symmetry planes for a 3-pole device.
A(*) An overhead clearance of 50 mm is required to remove the arc chutes.
An overhead clearance of 20 mm is required to remove the terminal block.



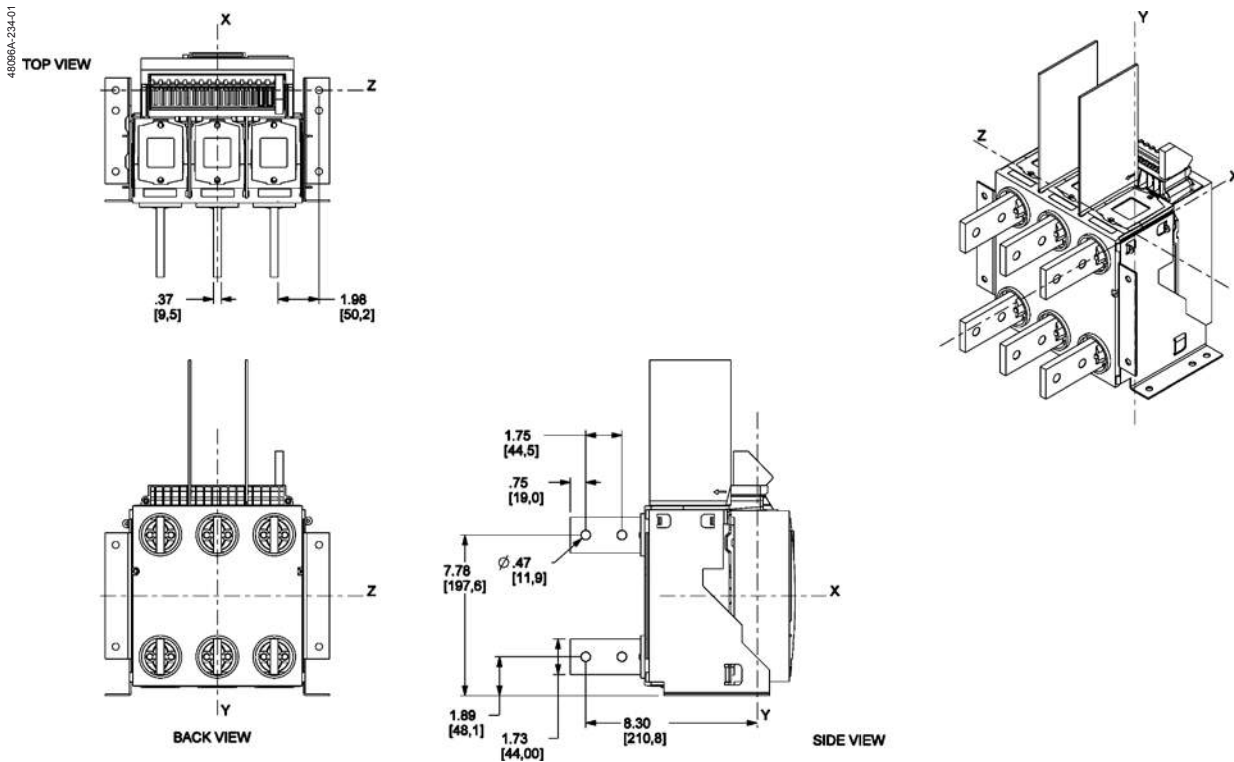
Fixed 3-pole device

Connections

General dimensions for all versions



Vertical rear connection

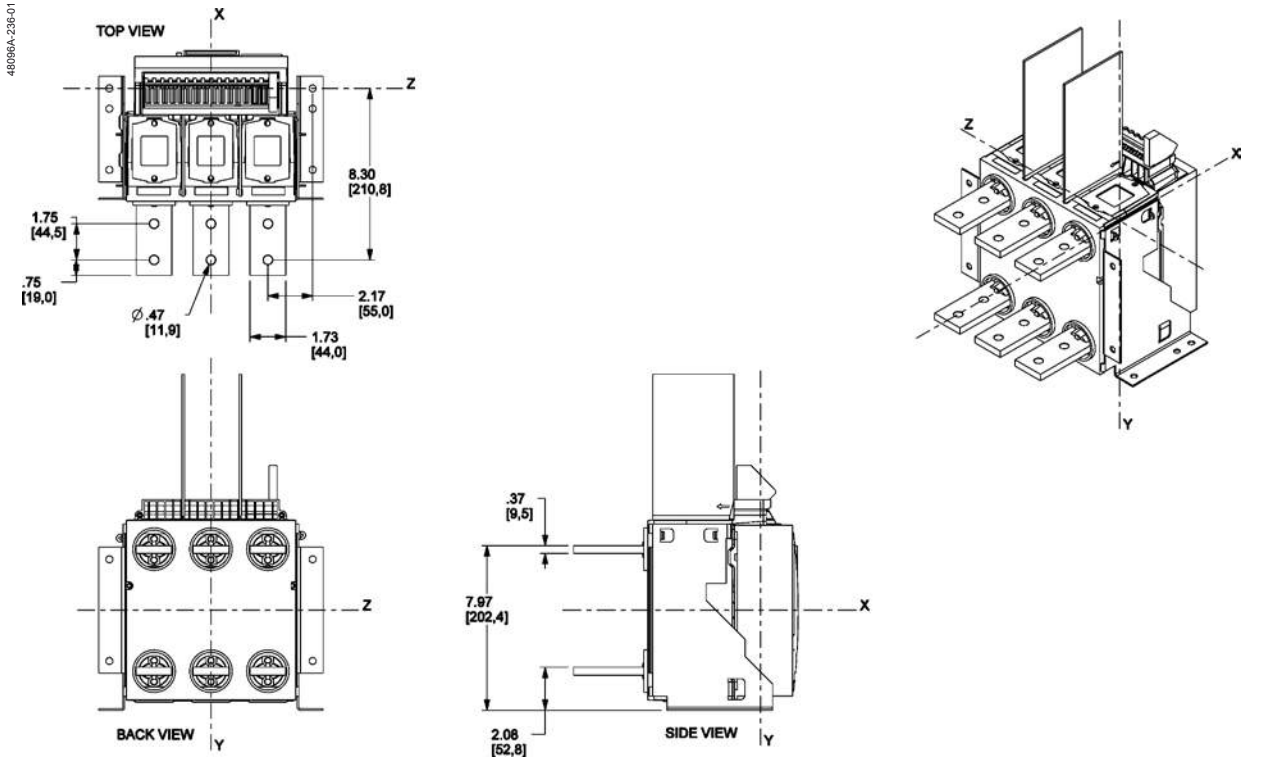


Note: dimensions in square brackets are in mm and other dimensions are in inches.

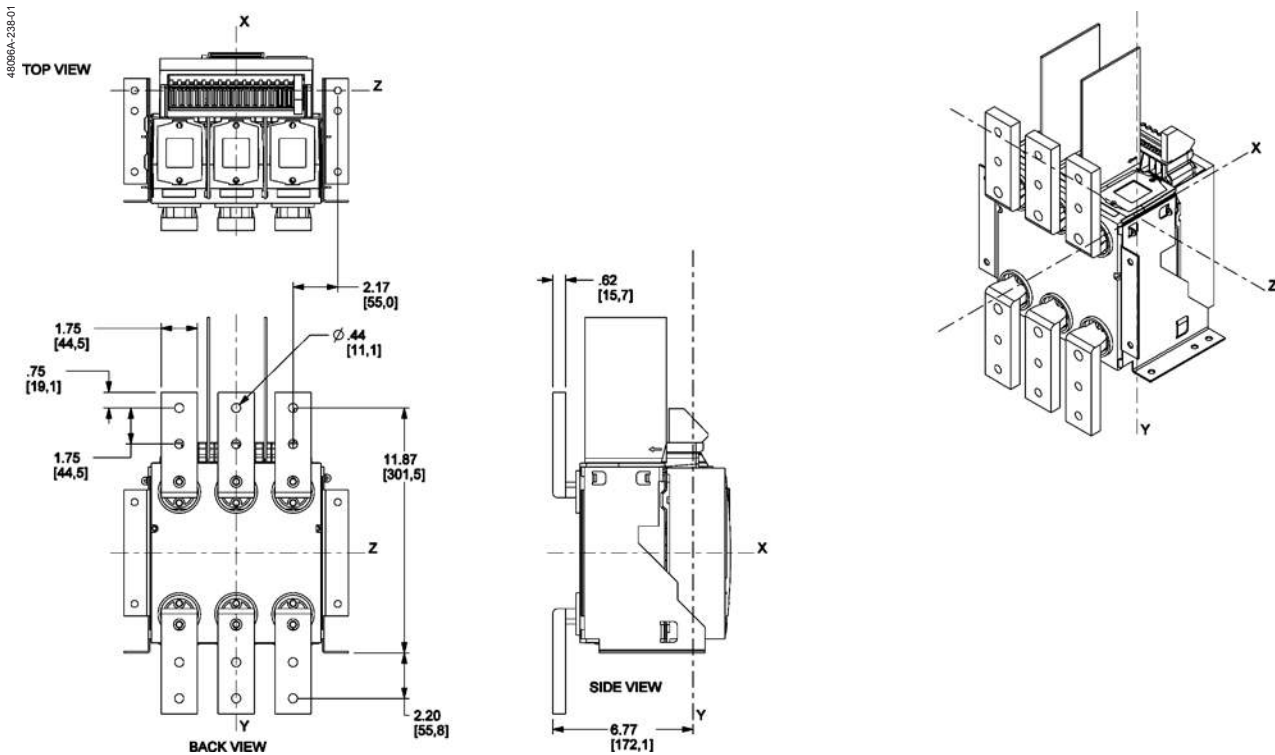


Connections

Horizontal rear connection



Front connection



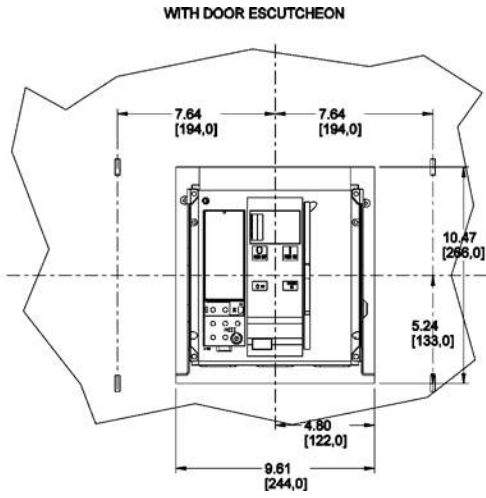
Note: dimensions in square brackets are in mm and other dimensions are in inches.



Connections

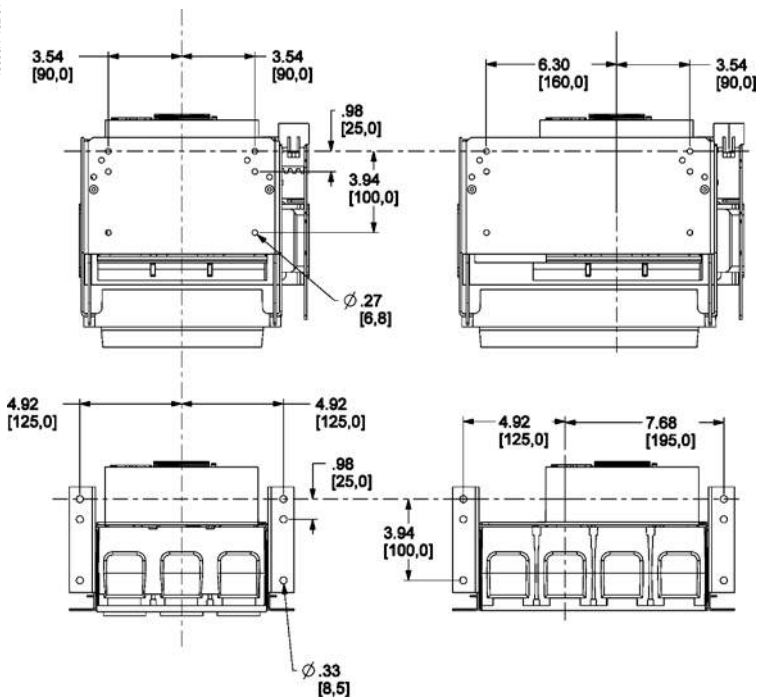
Door cutout

48096A-334-01



"Pan" Dimensions

48096A-482-01

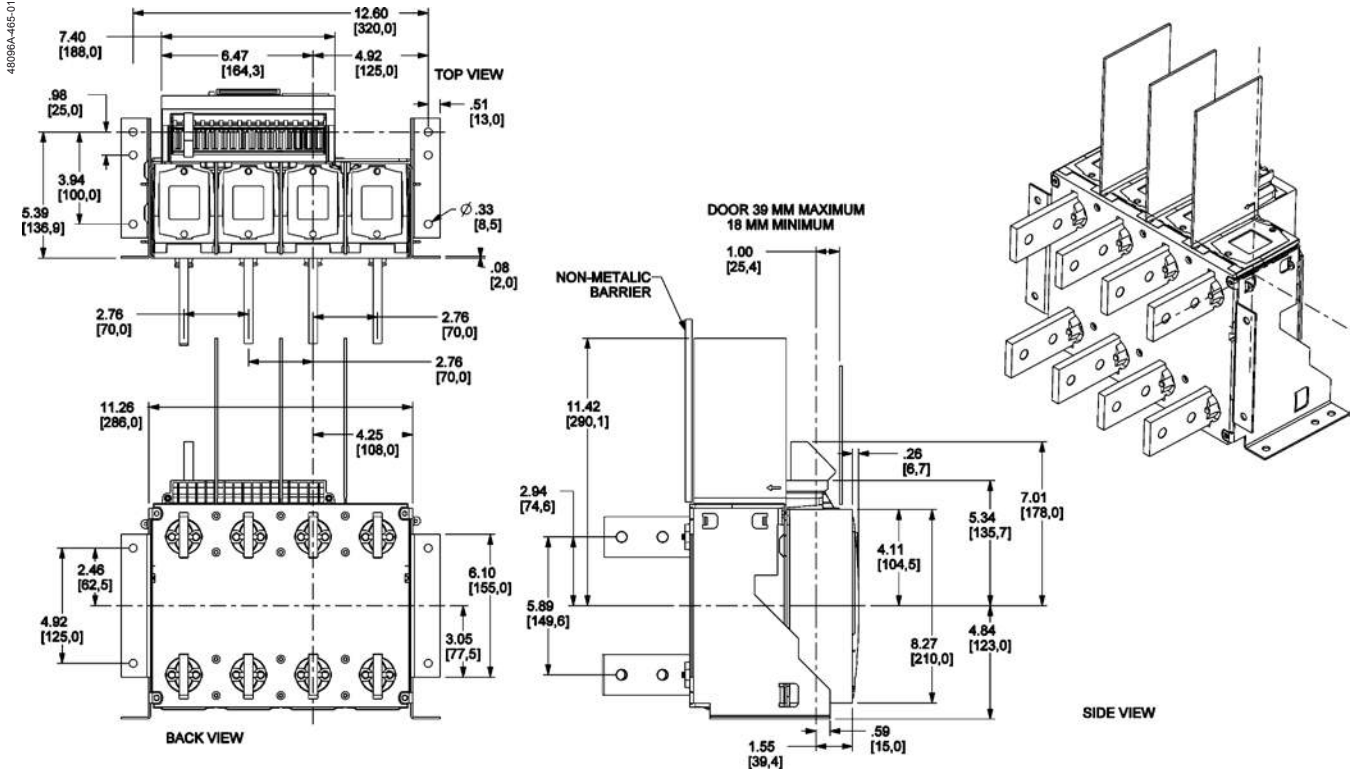


Note: dimensions in square brackets are in mm and other dimensions are in inches.

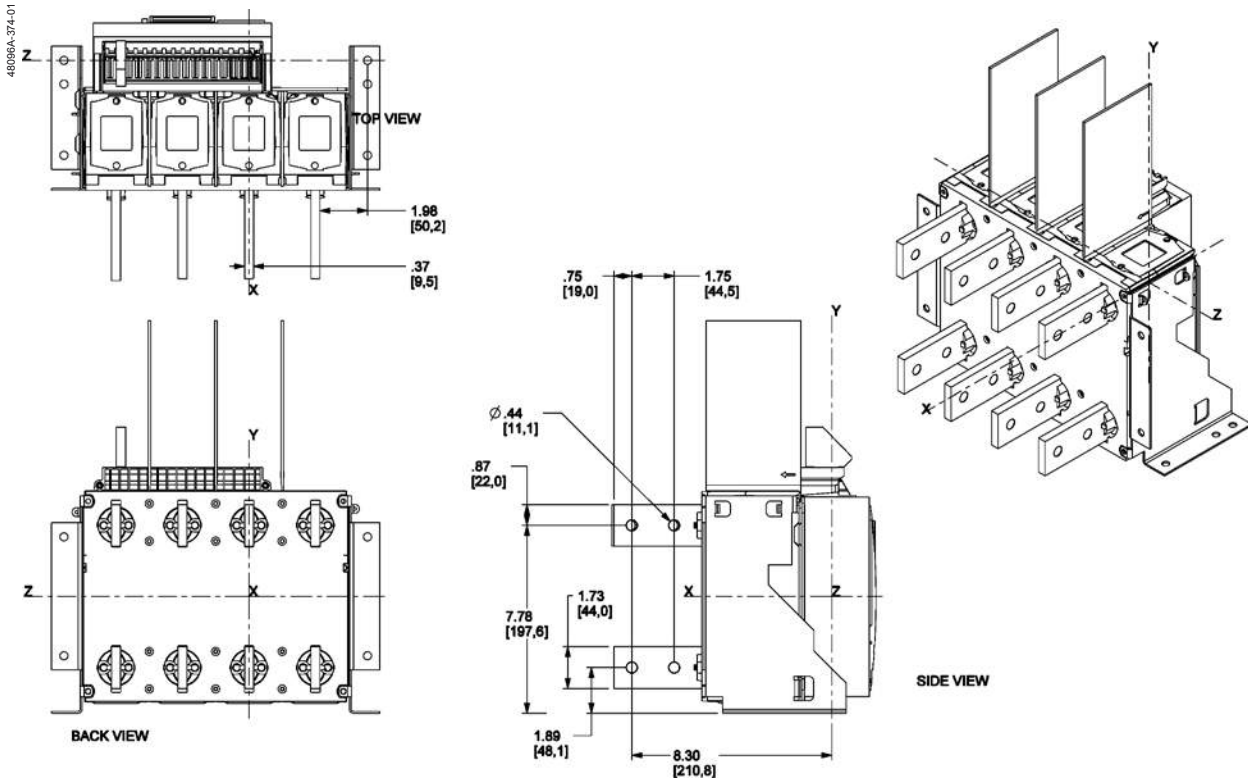


Connections

General dimensions for all versions



Vertical rear connection

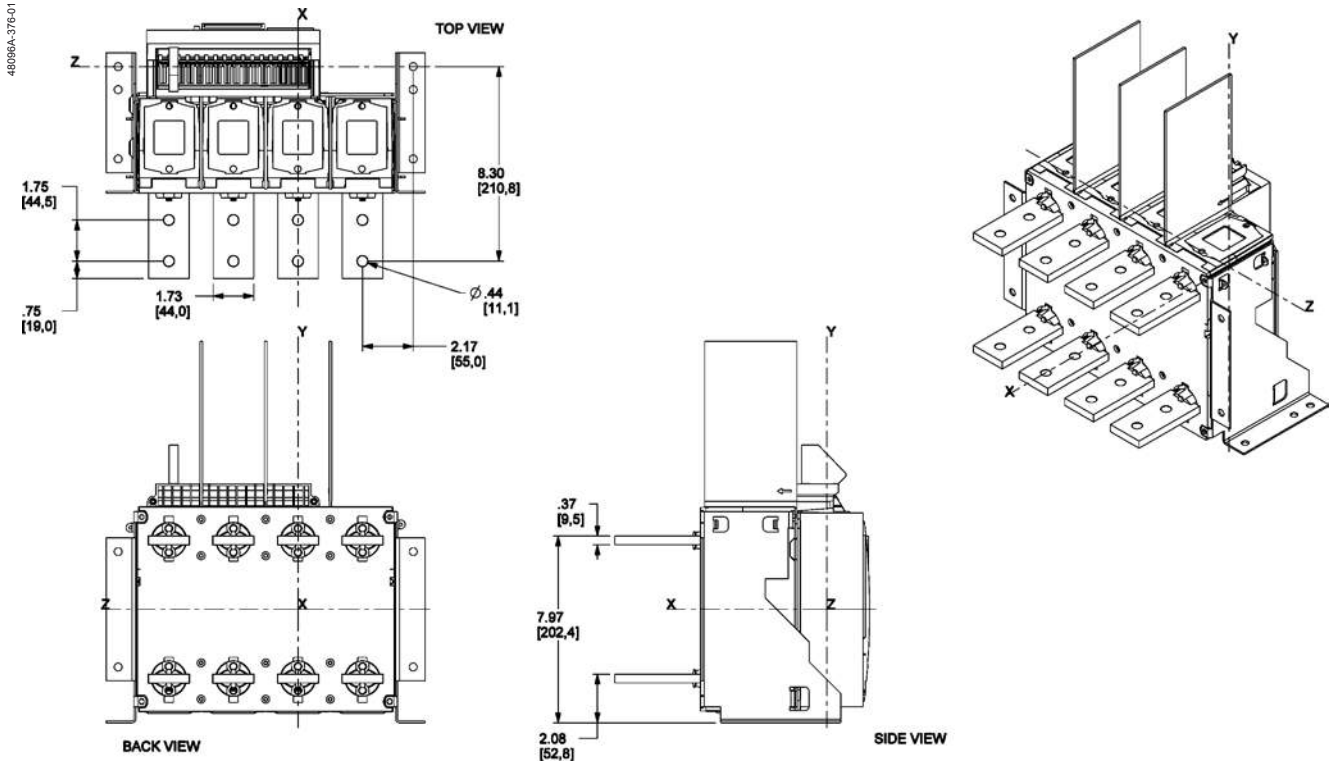


Note: dimensions in square brackets are in mm and other dimensions are in inches.

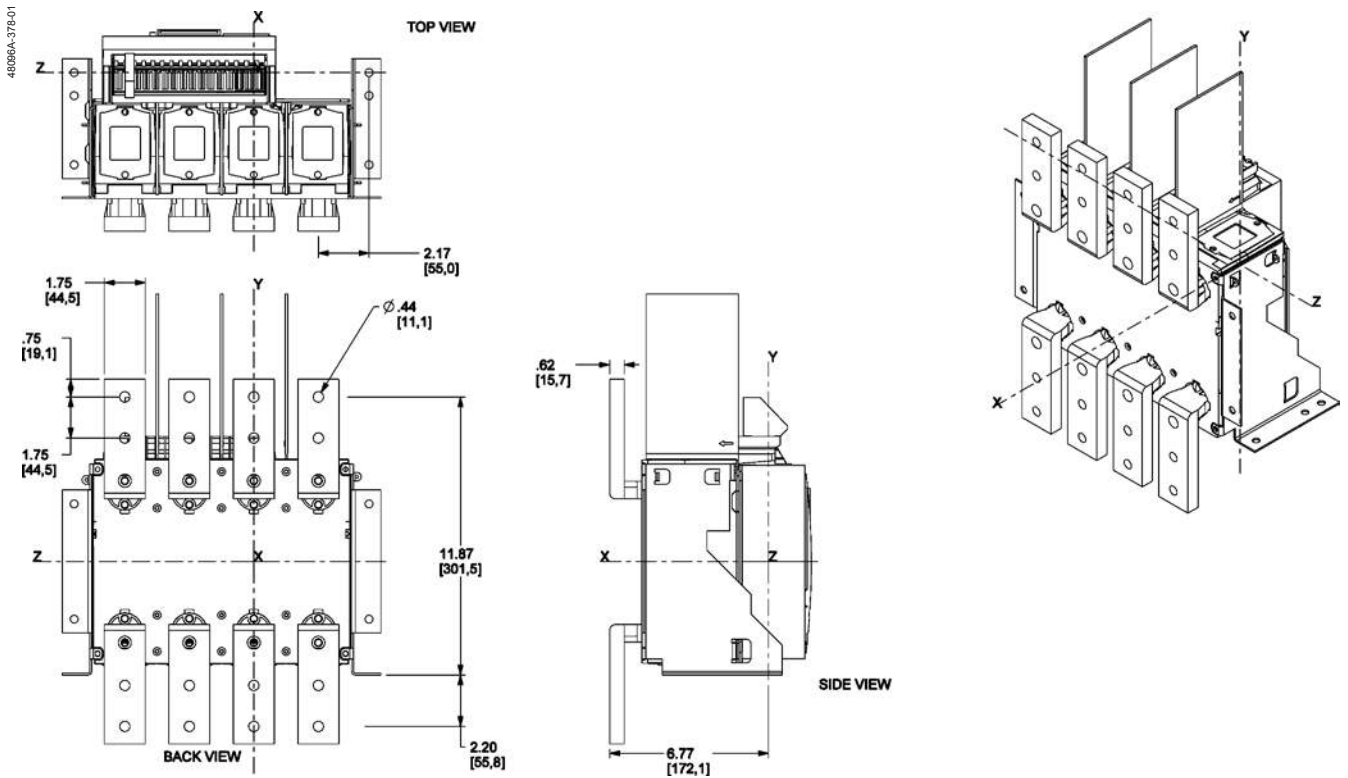


Connections

Horizontal rear connection



Front connection

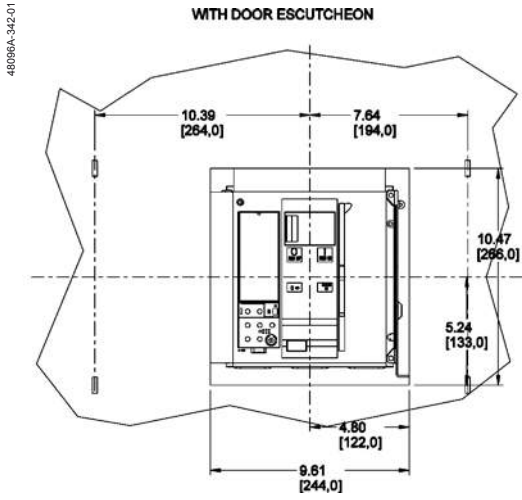


Note: dimensions in square brackets are in mm and other dimensions are in inches.



Connections

Door cutout

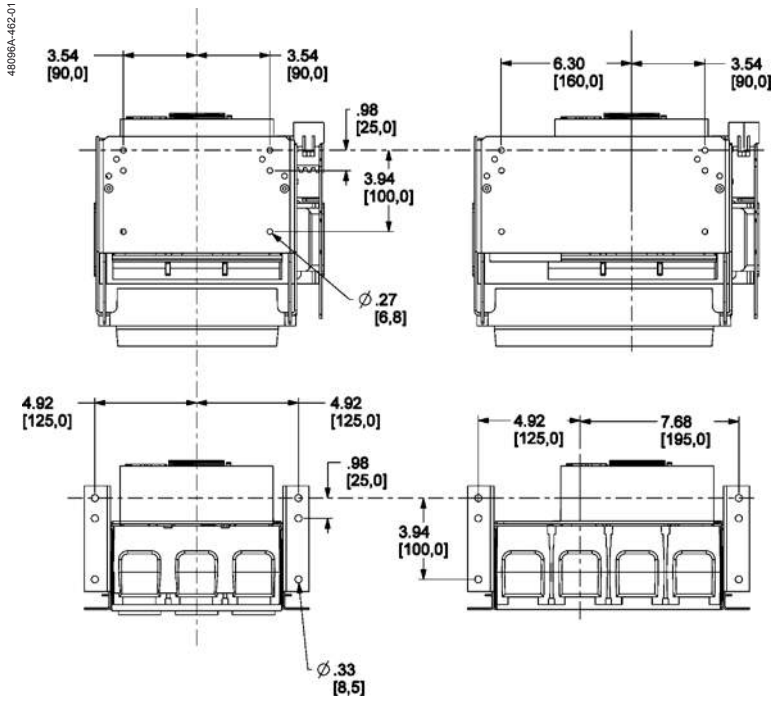


Note: dimensions in square brackets are in mm and other dimensions are in inches.



Connections

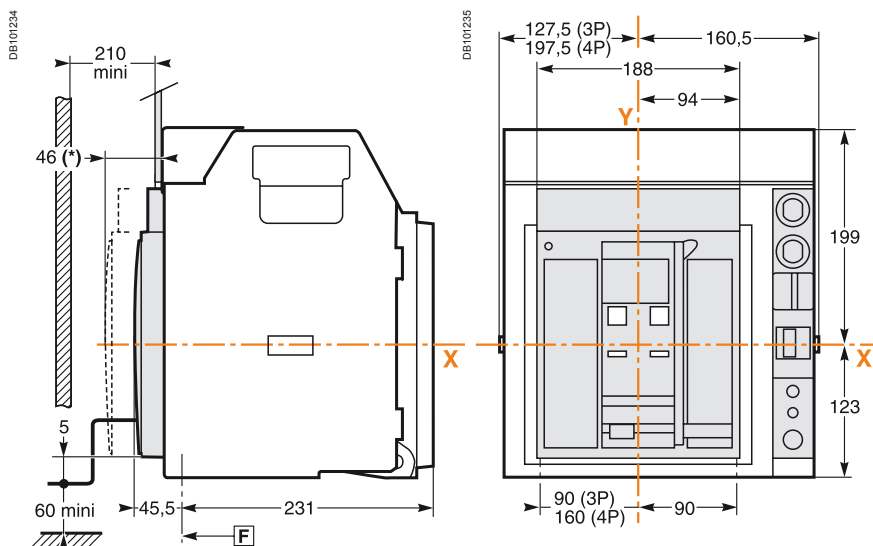
"Pan" Dimensions



Note: dimensions in square brackets are in mm and other dimensions are in inches.

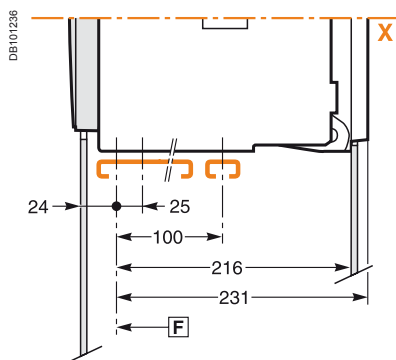


Dimensions

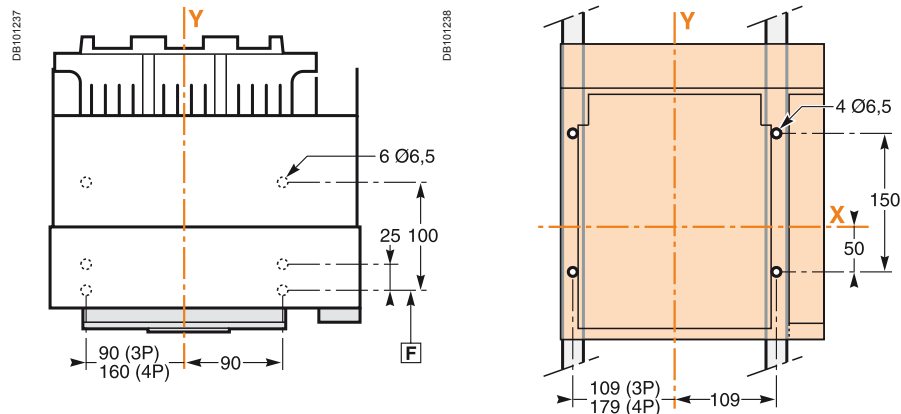


(*) Disconnected position.

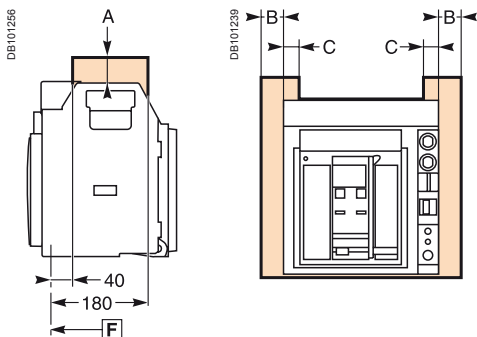
Bottom mounting (on base plate or rails)



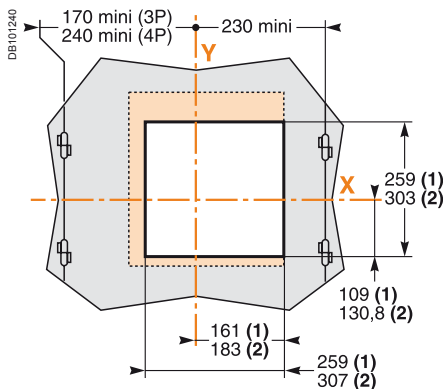
Rear mounting detail (on upright or backplate)



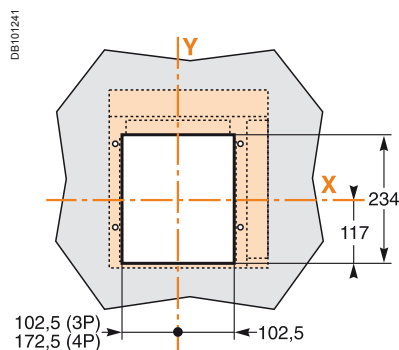
Safety clearances



Door cutout



Rear panel cutout



For voltages < 690 V or equal to 1000 V

	Parts		
	Insulated	Metal	Energised
A	0	0	30
B	10	10	60
C	0	0	30

F : datum.

(1) Without escutcheon.
(2) With escutcheon.

Note: dimensions in mm.

Note: X and Y are the symmetry planes for a 3-pole device.



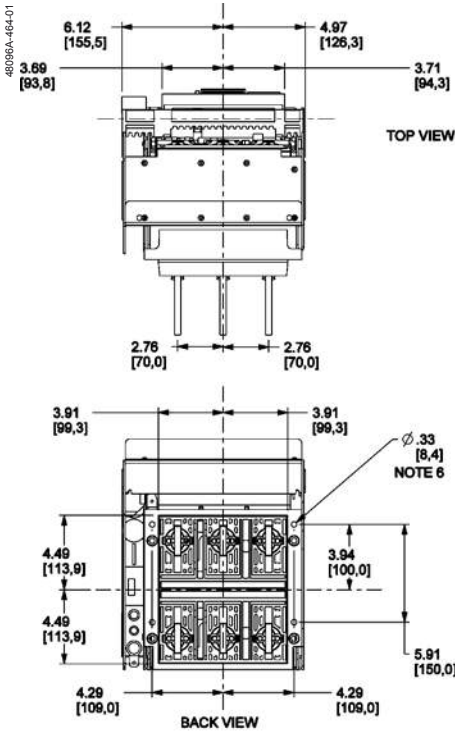
Drawout 3-pole device

Dimensions of Masterpact NT 3-pole device

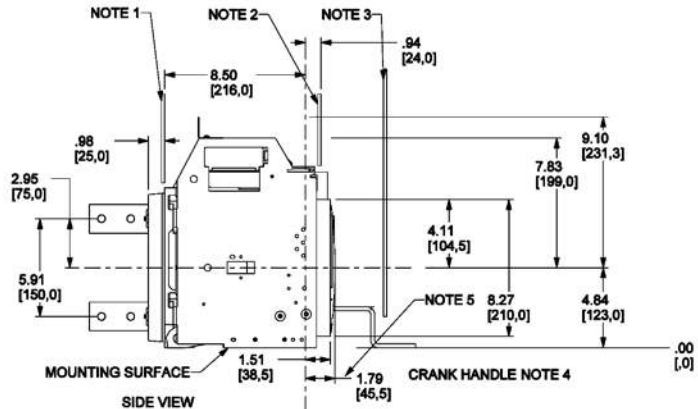
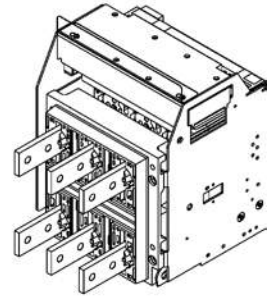
Number of poles	Rating	Dimension (H x W x D)		Vent areas		Bottom	
		In	mm	Top In ²	mm ²	In ²	mm ²
3P	800 A and 1200 A	18.25 x 13 x 9.5	463.5 x 330.2 x 214.3	9	5806	9	5806

Connections

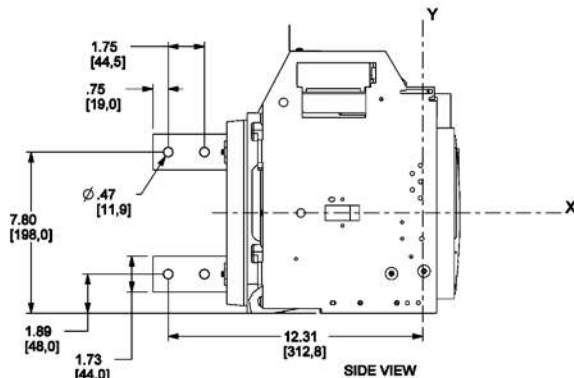
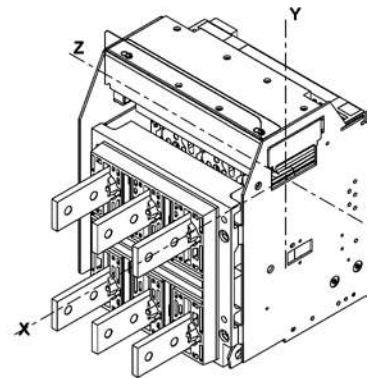
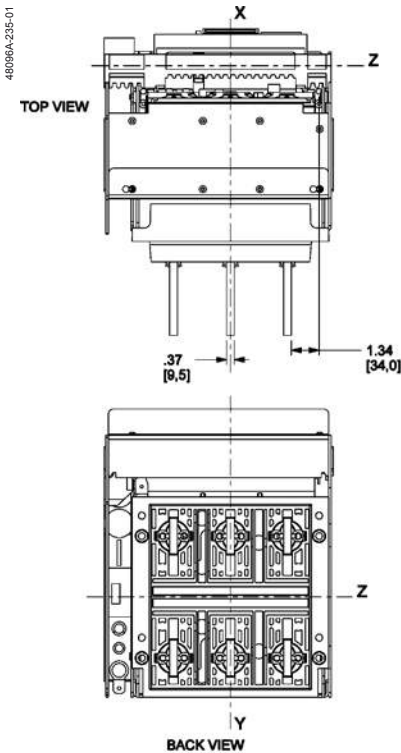
General dimensions for all versions



1. REAR PANEL
2. FRONT DOOR
3. DISTANCE TO DRAWOUT POSITION 210 MM
4. CRANK HANDLE EXTENDS TO MOUNTING SURFACE ADD 60 MM
5. DISTANCE CONNECT TO DRAWOUT POSITION 46 MM
6. REAR PANEL MOUNTING HOLES.



Vertical rear connection

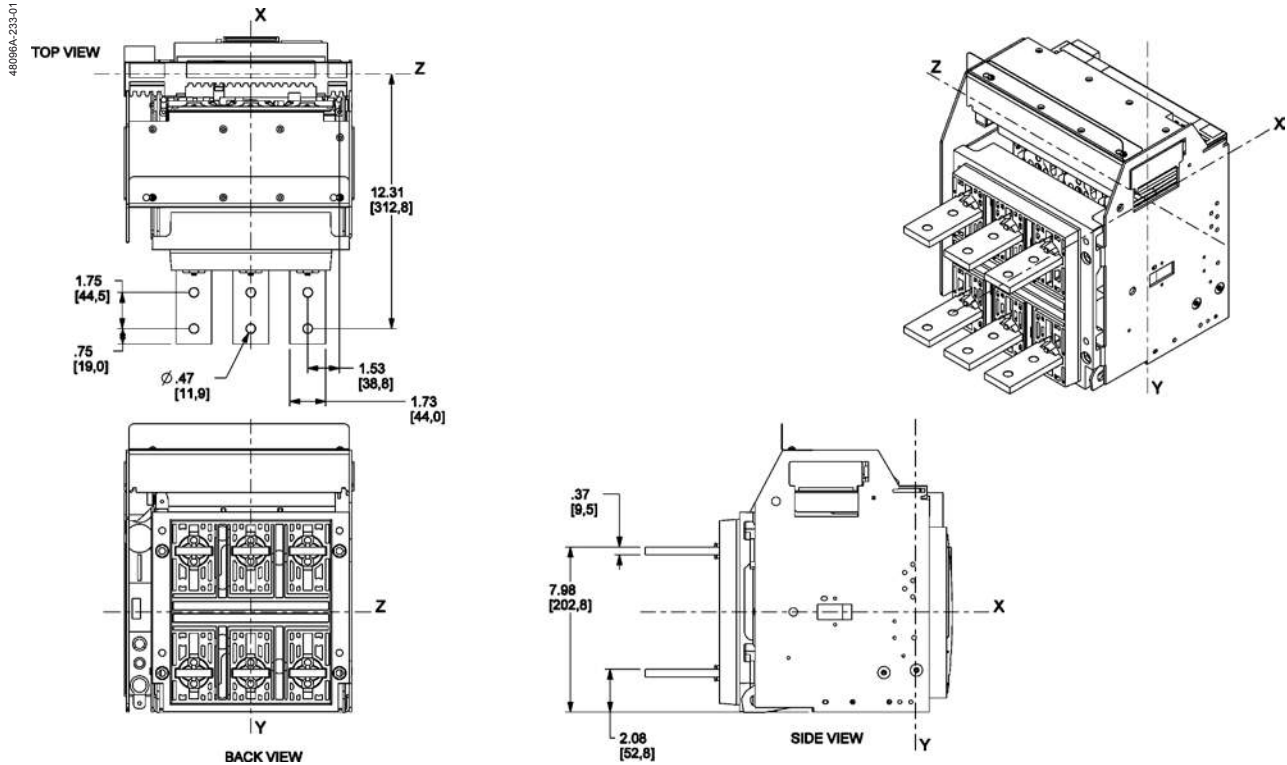


Note: dimensions in square brackets are in mm and other dimensions are in inches.

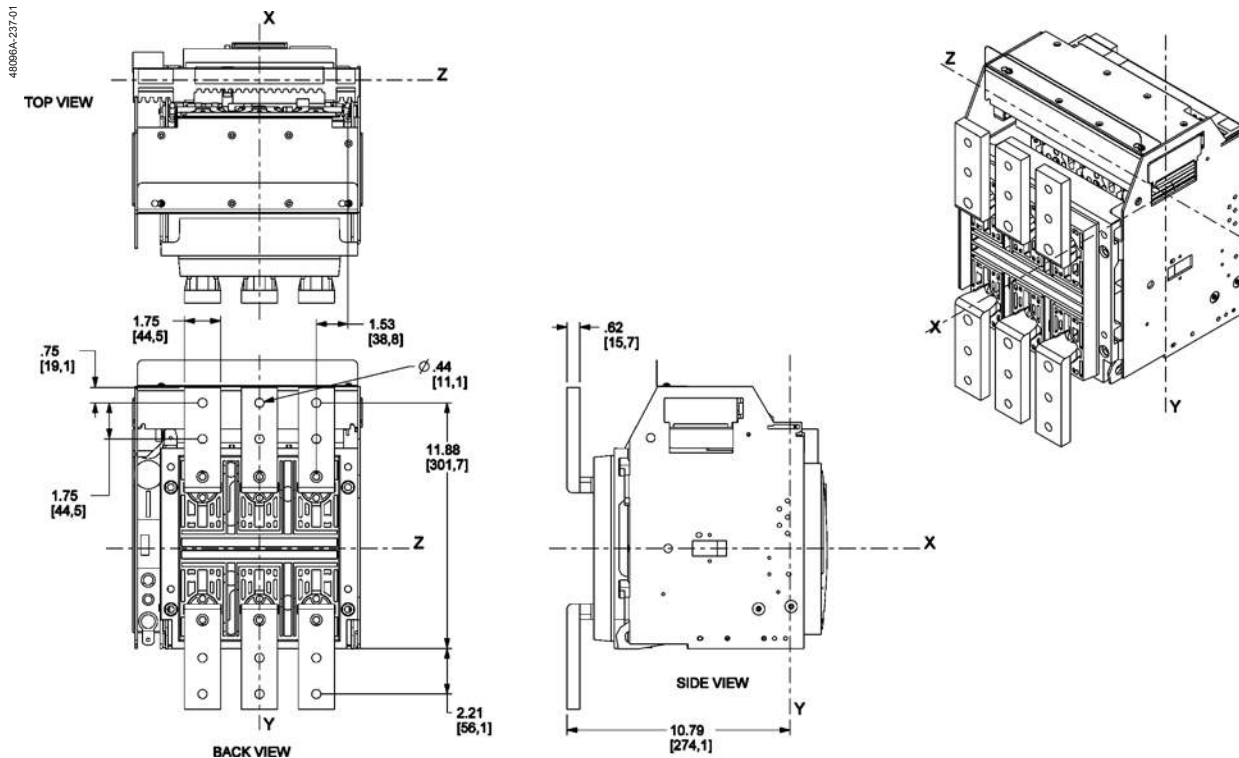


Connections

Horizontal rear connection



Front connection



Note: dimensions in square brackets are in mm and other dimensions are in inches.

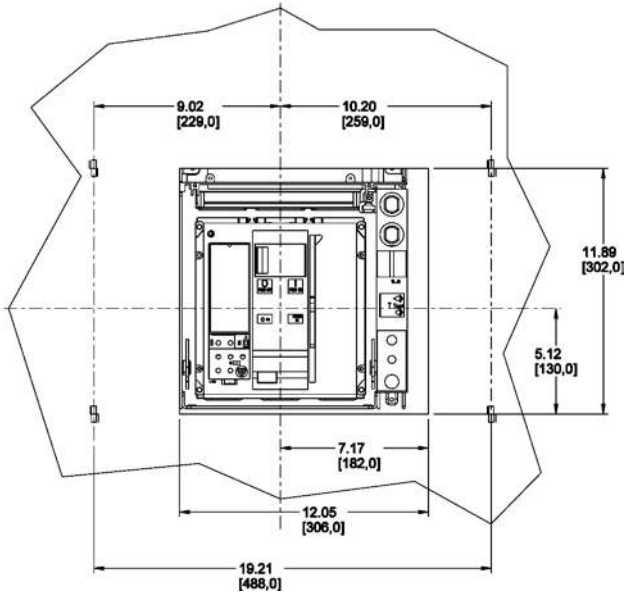


Connections

Door cutout

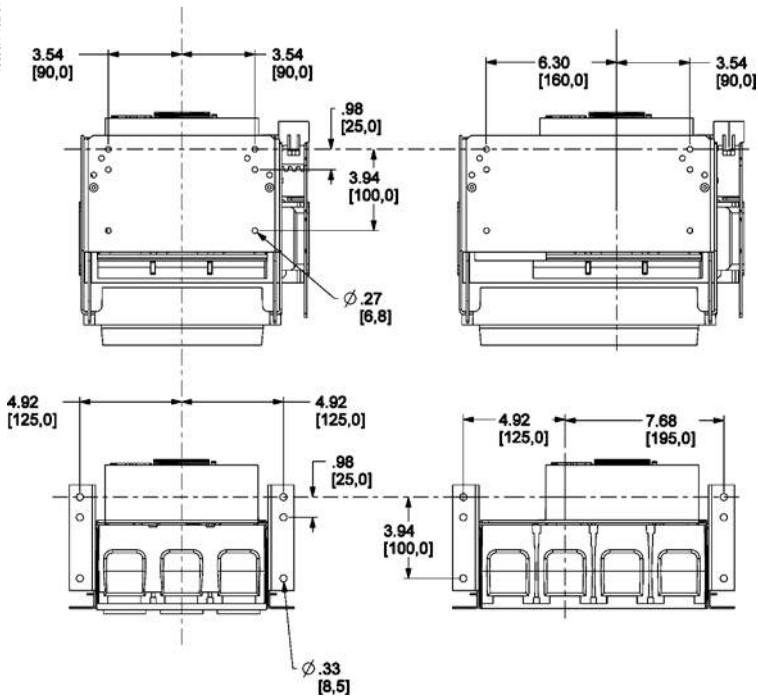
48096A-330-01

WITH DOOR ESCUTCHEON



"Pan" Dimensions

48096A-462-01



Note: dimensions in square brackets are in mm and other dimensions are in inches.

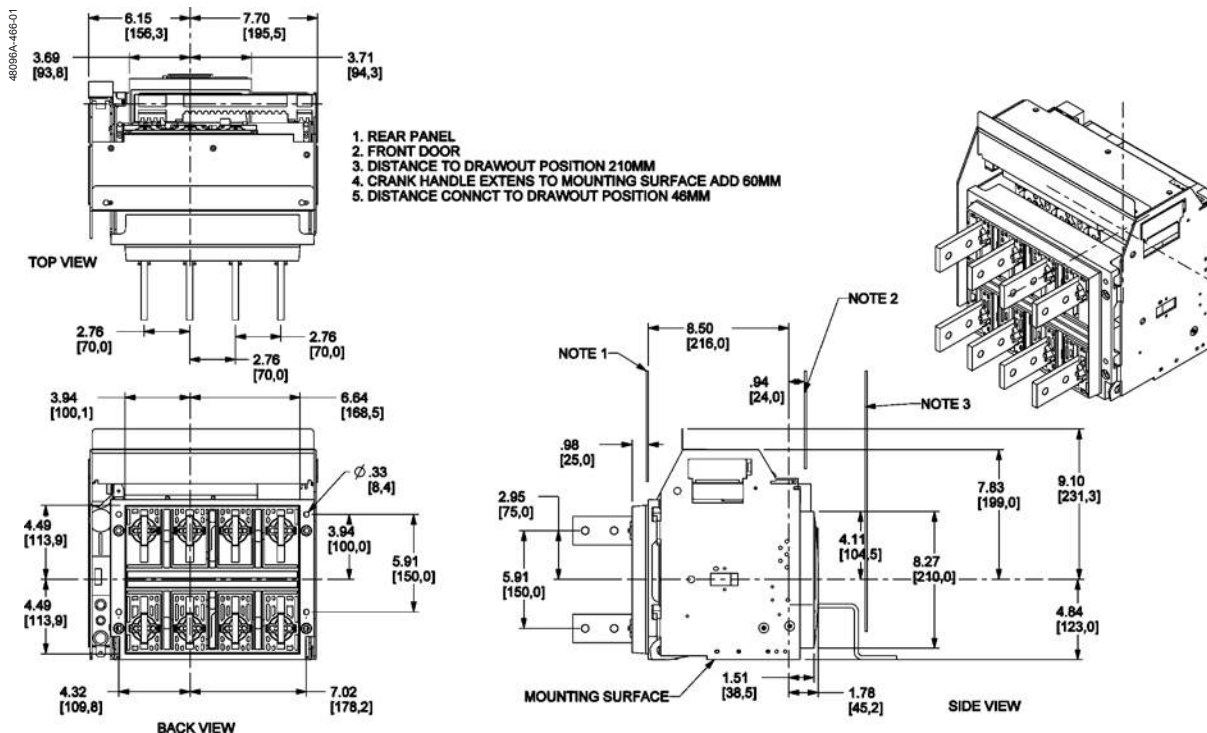


Dimensions of Masterpact NT 4-pole device

Number of poles	Rating	Dimension (H x W x D)		Vent areas		Bottom	
		In	mm	Top In ²	mm ²	In ²	mm ²
4P	800 A and 1200 A	18.25 x 15.8 x 9.5	463.5 x 401.3 x 214.3	9	5806	9	5806

Connections

General dimensions for all versions



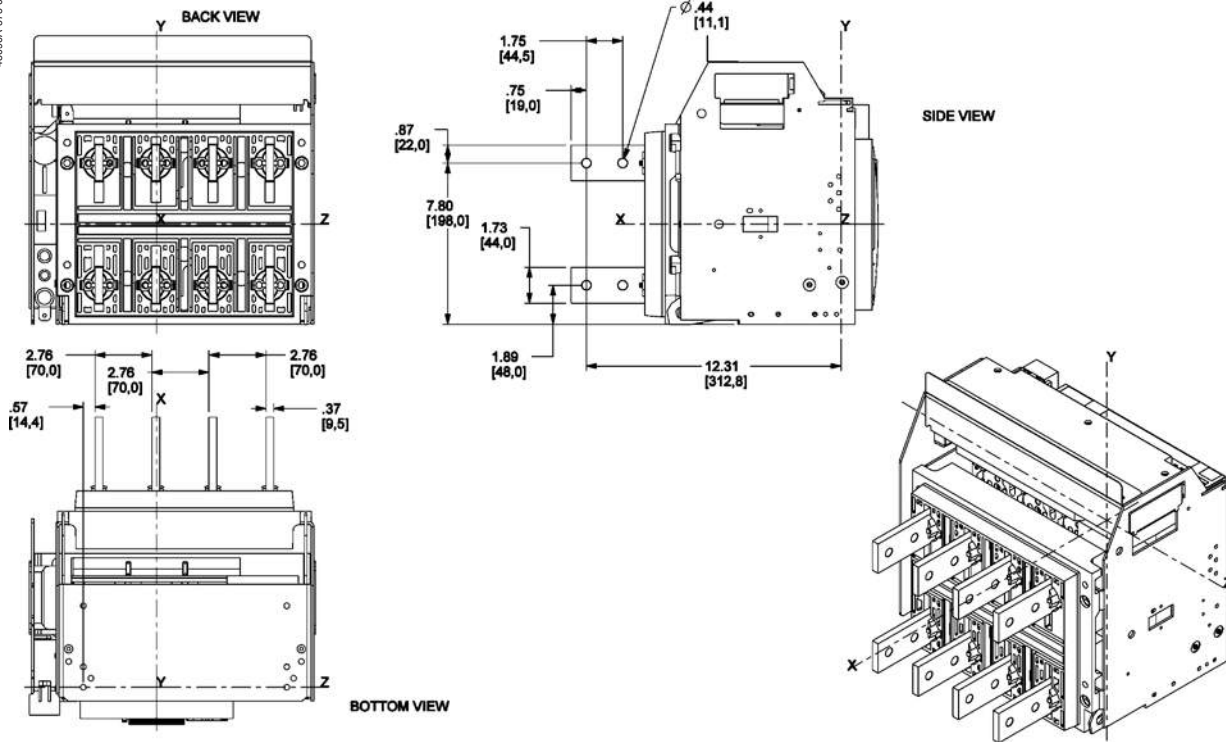
Note: dimensions in square brackets are in mm and other dimensions are in inches.



Connections

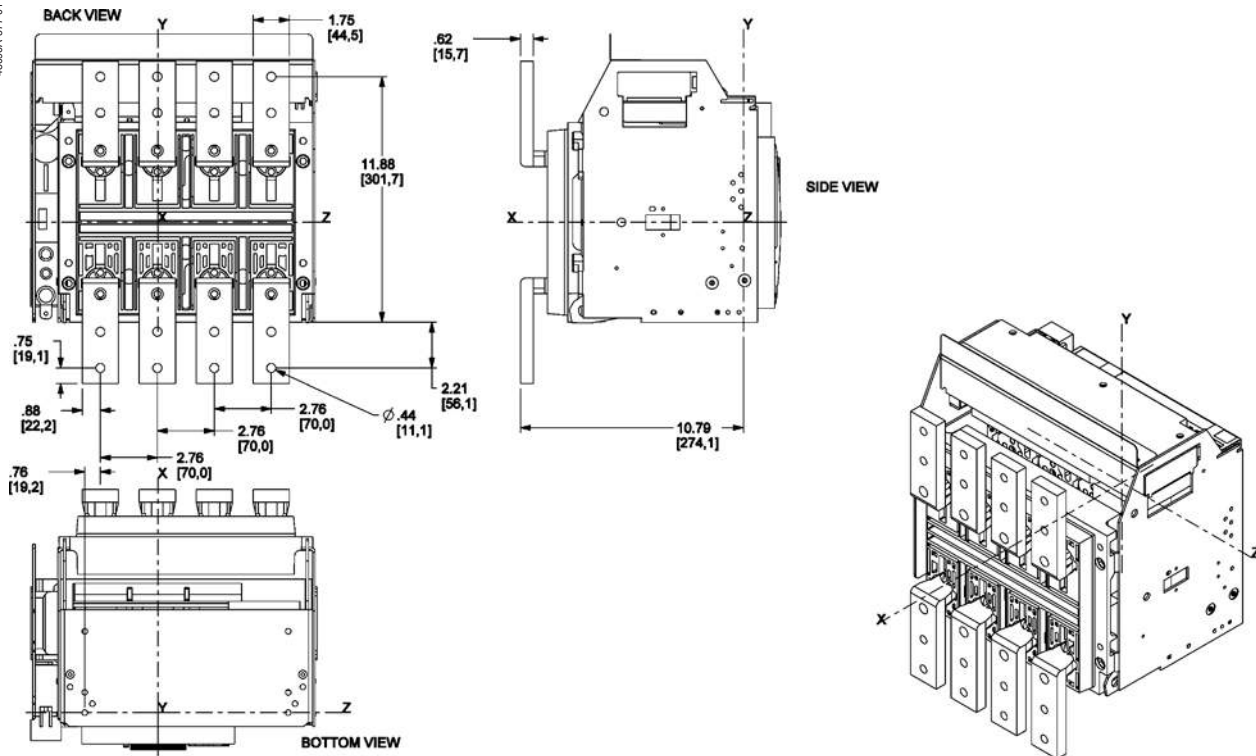
Vertical rear connection

48096A-375-01



"Pan" Dimensions

48096A-377-01

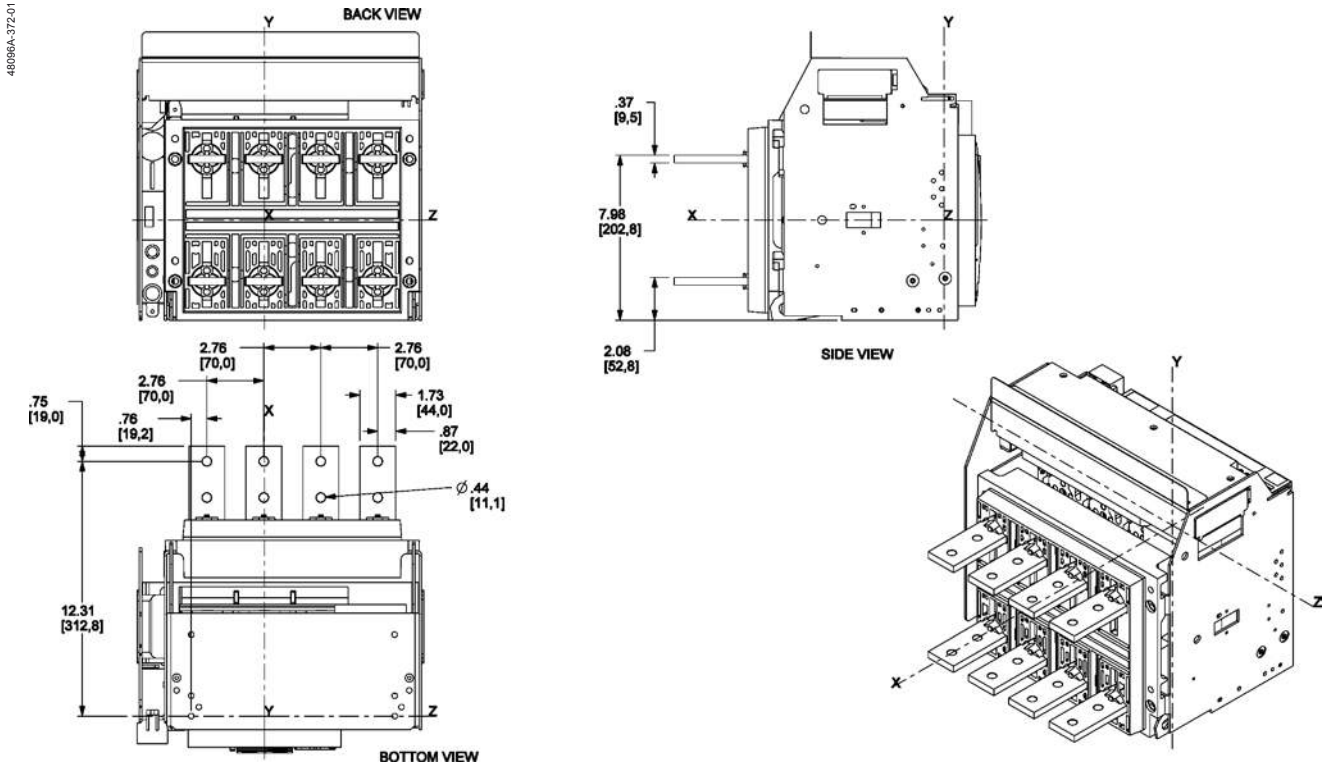


Note: dimensions in square brackets are in mm and other dimensions are in inches.

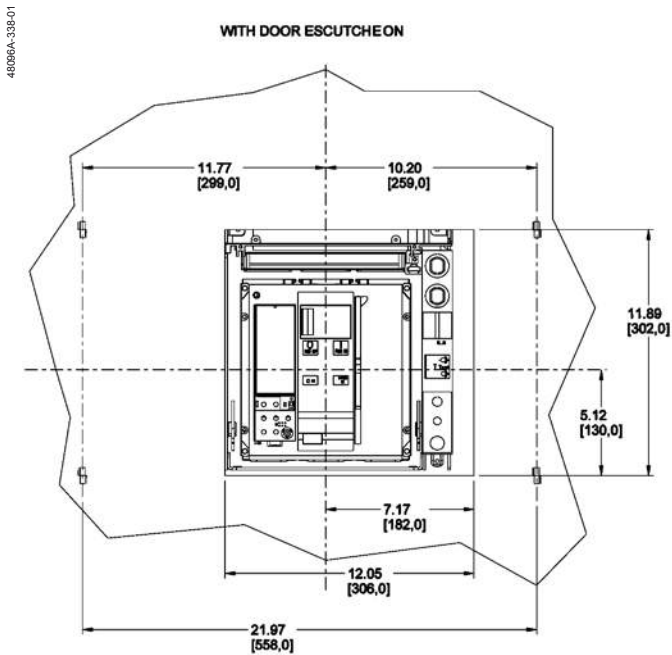


Connections

Horizontal rear connection



Door cutout

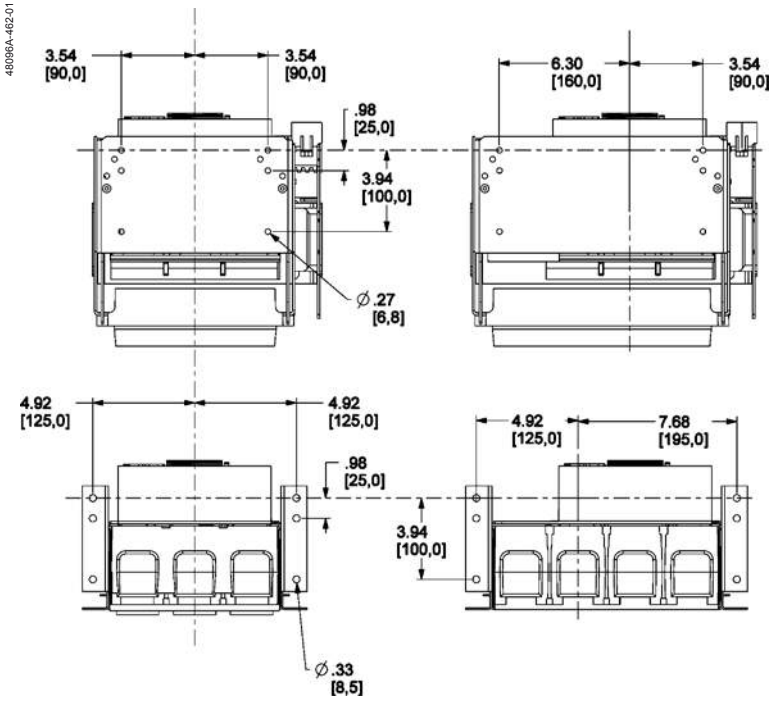


Note: dimensions in square brackets are in mm and other dimensions are in inches.



Connections

"Pan" Dimensions

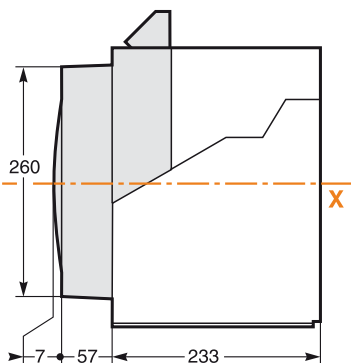


Note: dimensions in square brackets are in mm and other dimensions are in inches.

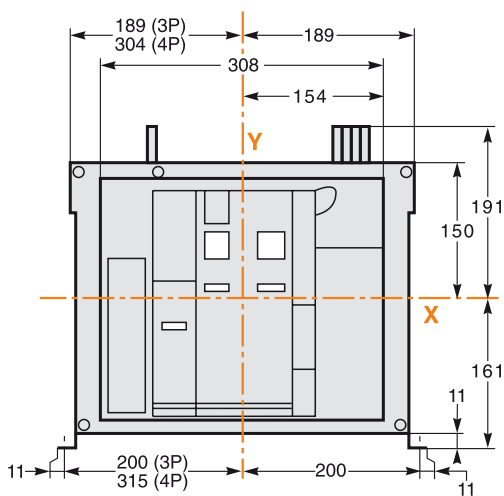


Dimensions

DB101267

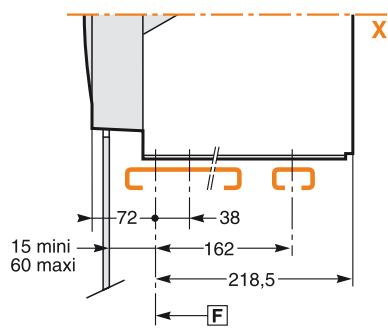


DB101268



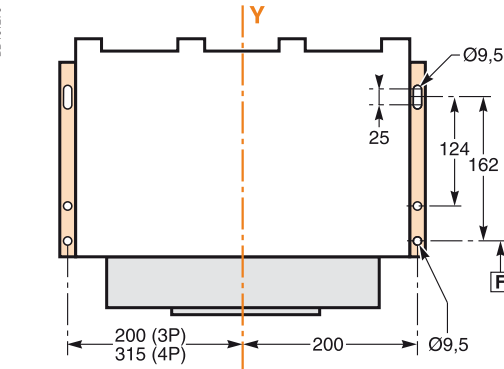
Mounting on base plate or rails

DB101269



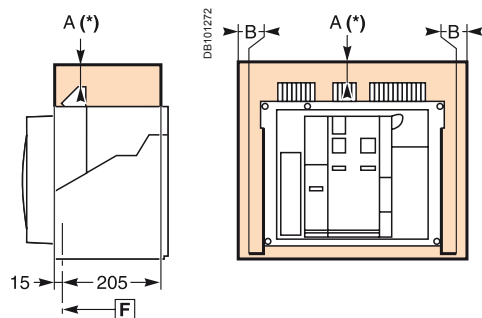
Mounting detail

DB101270



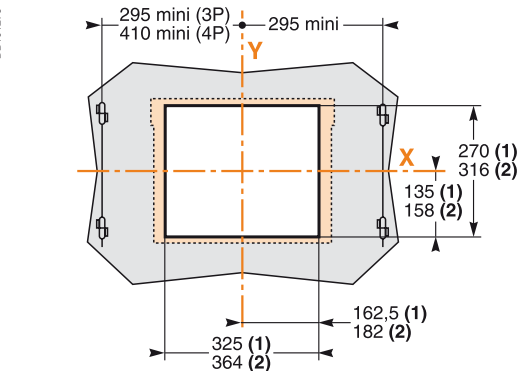
Safety clearances

DB101271



Door cutout

DB101273



	Parts		
	Insulated	Metal	Energised
A	0	0	100
B	0	0	60

Note: dimensions in mm.

F : datum.

(1) Without escutcheon.
(2) With escutcheon.

Note: X and Y are the symmetry planes for a 3-pole device.

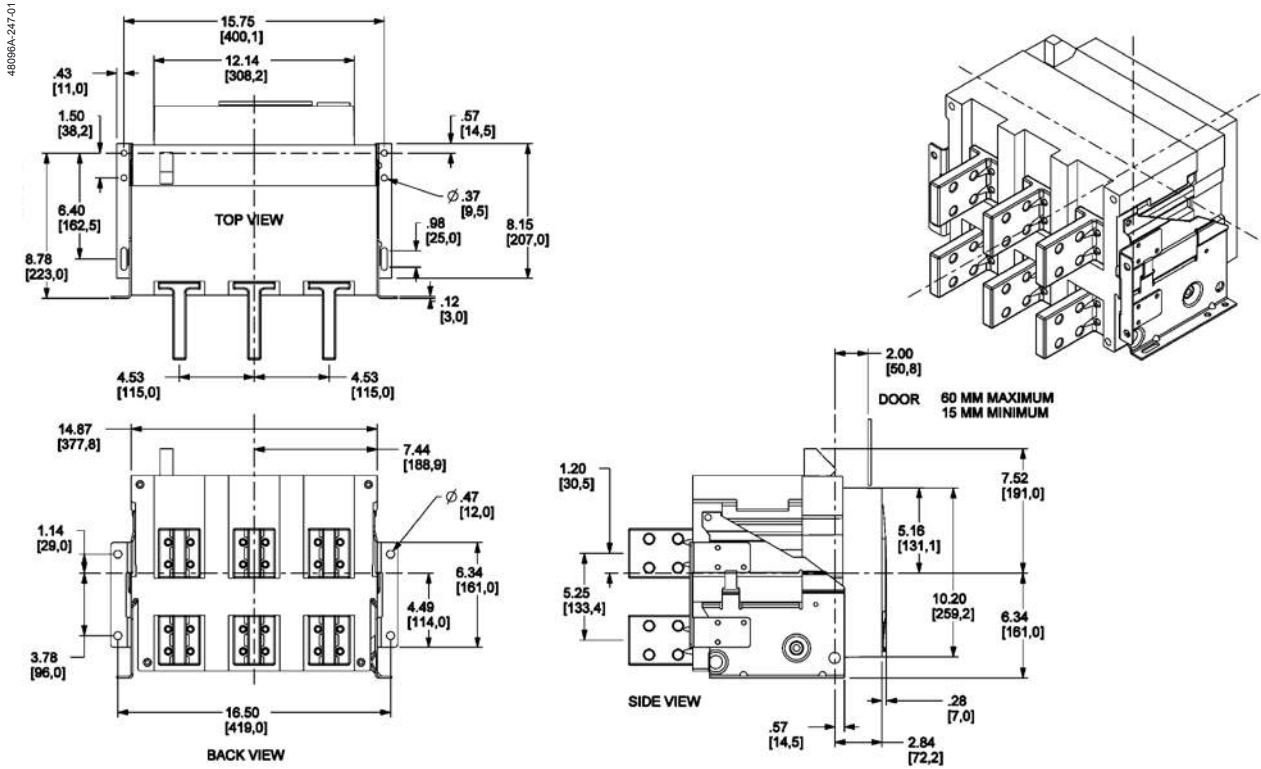
A(*) An overhead clearance of 110 mm is required to remove the arc chutes.
An overhead clearance of 20 mm is required to remove the terminal block.



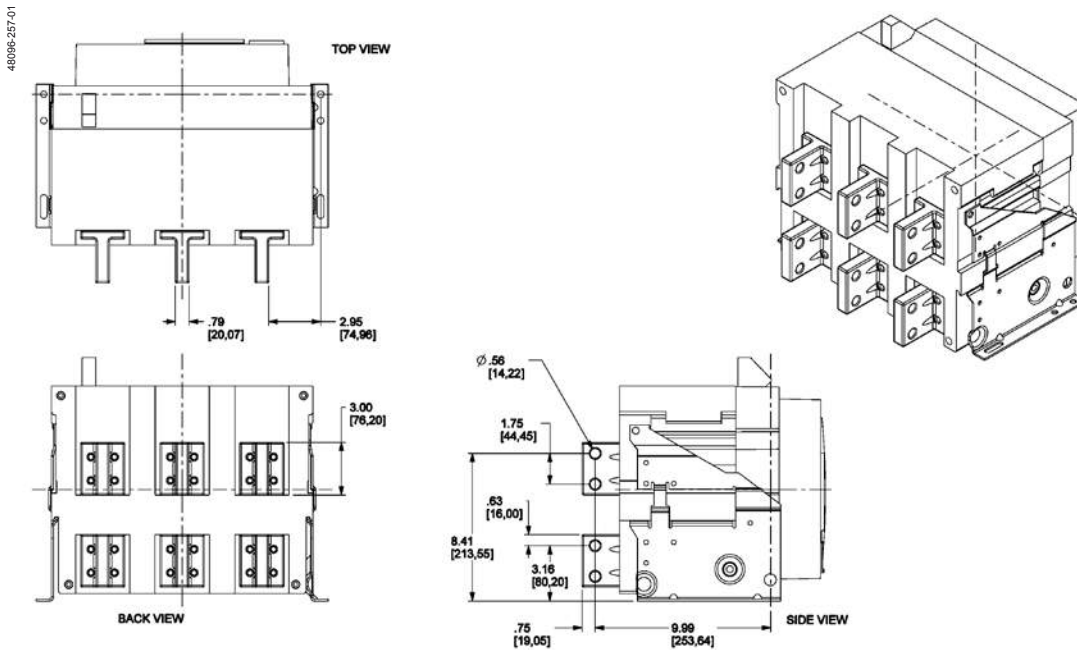
Fixed 3-pole device

Connections

General dimensions for all versions



Vertical rear connection from 800 A to 2000 A



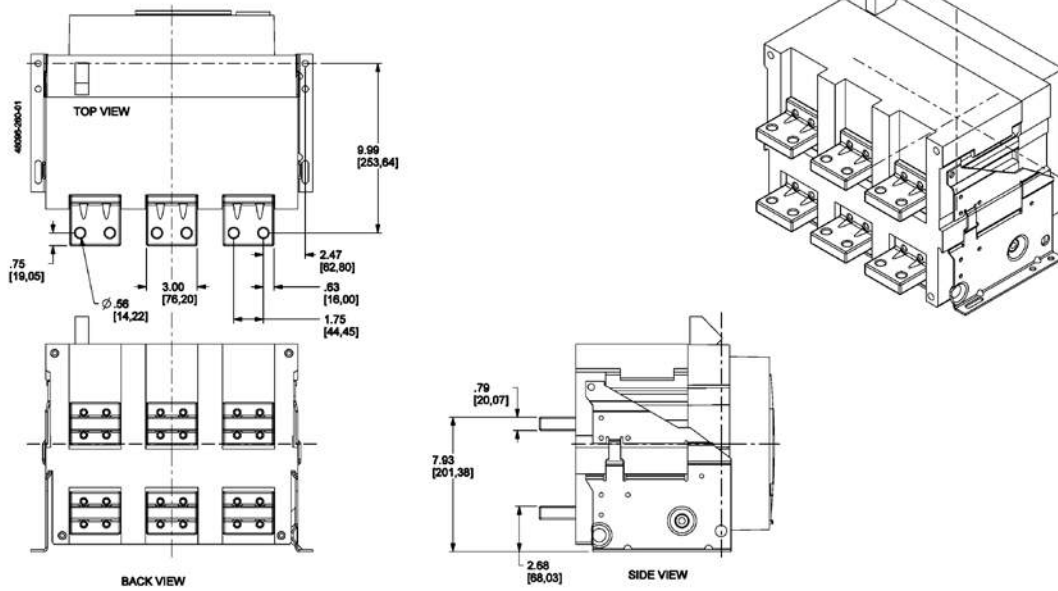
Note: dimensions in square brackets are in mm and other dimensions are in inches.



Connections

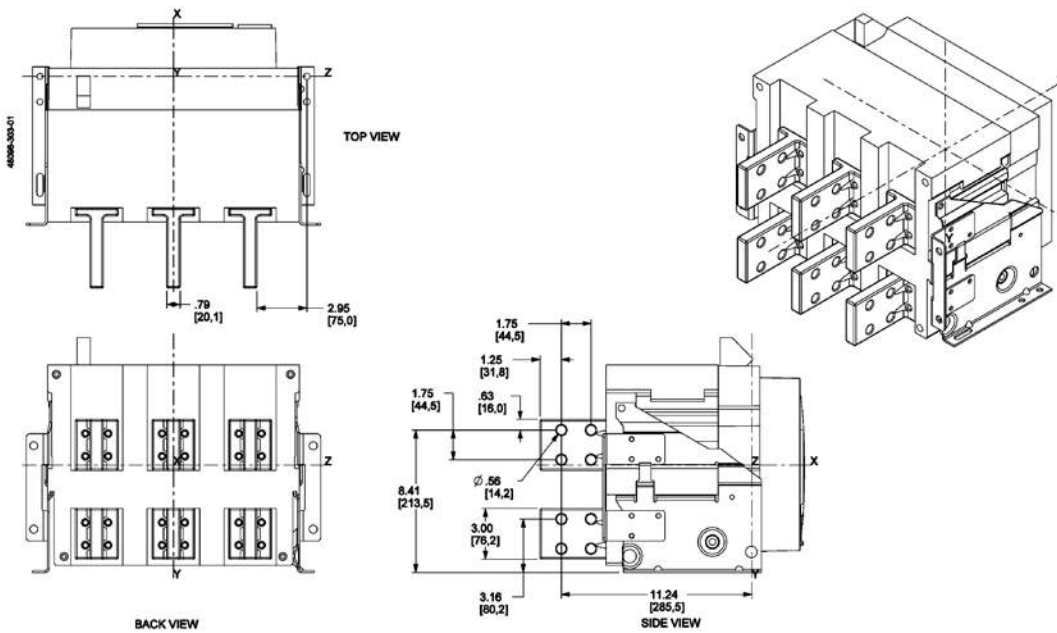
Horizontal rear connection from 800 A to 2000 A

4809EA-260-01



Horizontal rear connection from 2500 A to 3000 A

4809EA-303-01

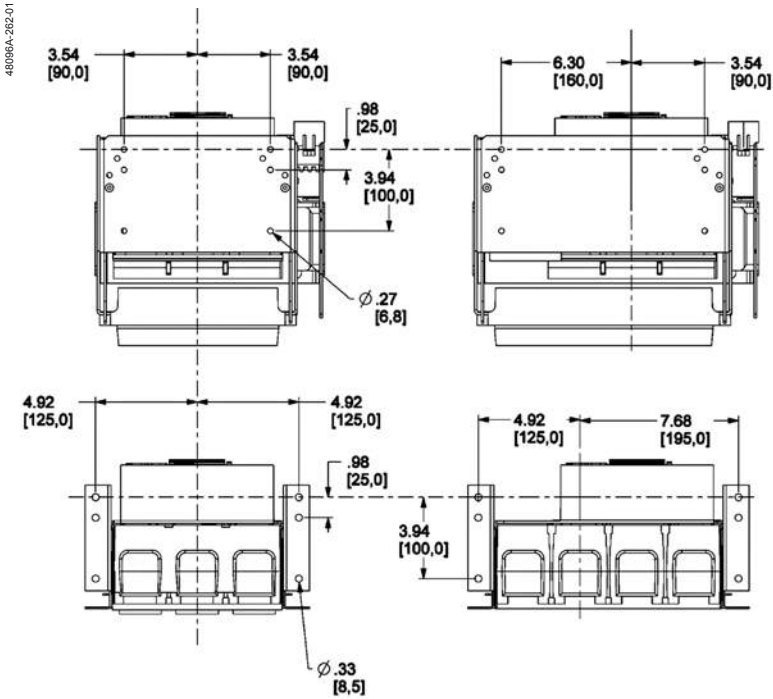


Note: dimensions in square brackets are in mm and other dimensions are in inches.

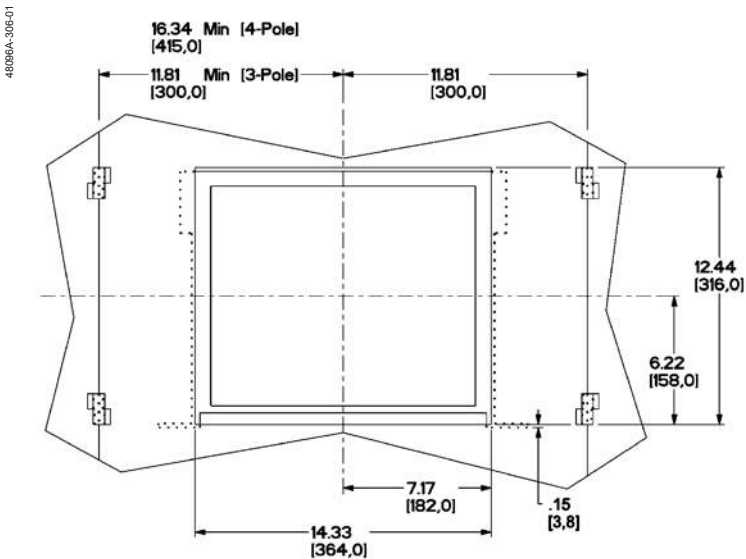


Connections

Horizontal rear connection from 2500 A to 3000 A



Door cutout from 800 A to 3000 A

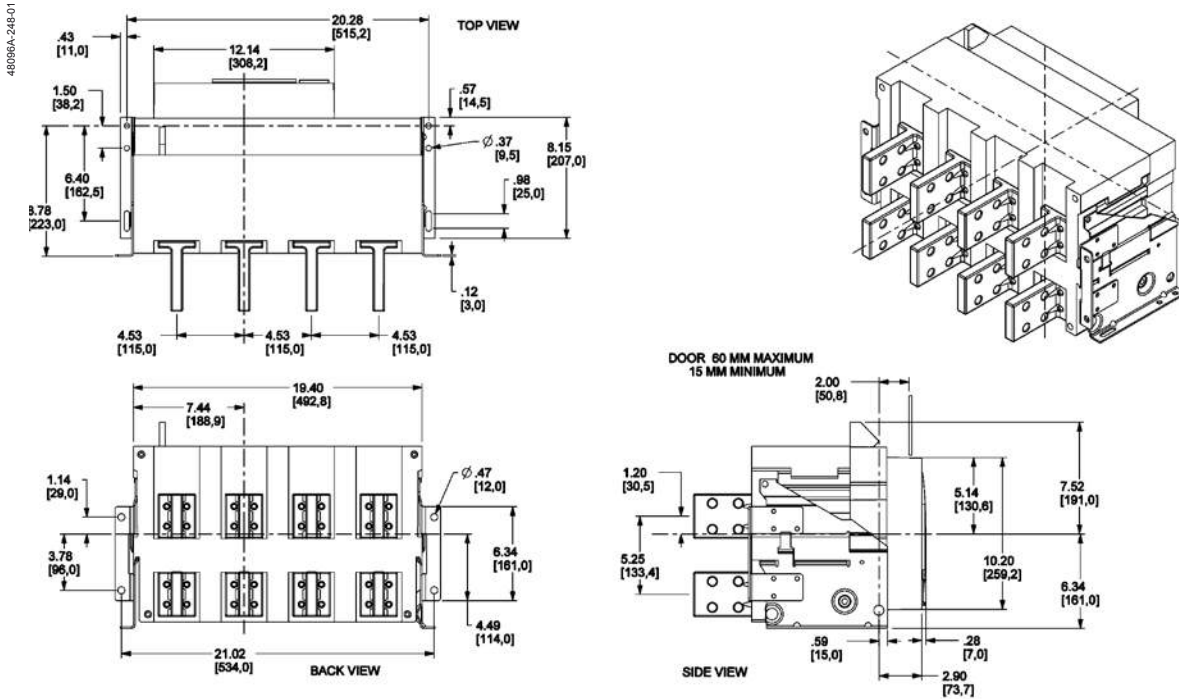


Note: dimensions in square brackets are in mm and other dimensions are in inches.

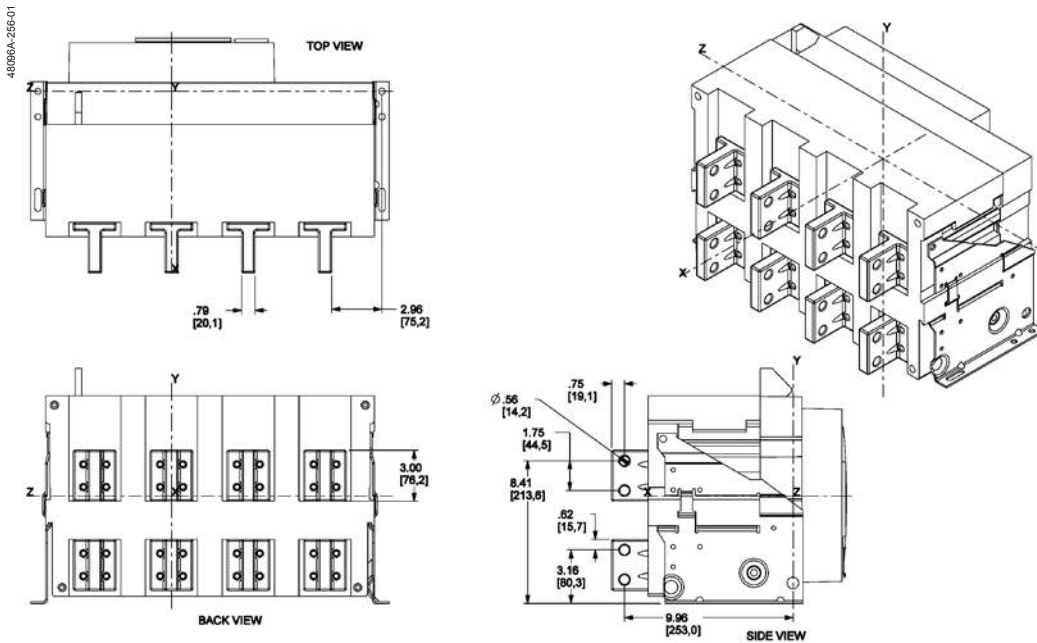


Connections

General dimensions for all versions



Vertical rear connection from 800 A to 2000 A



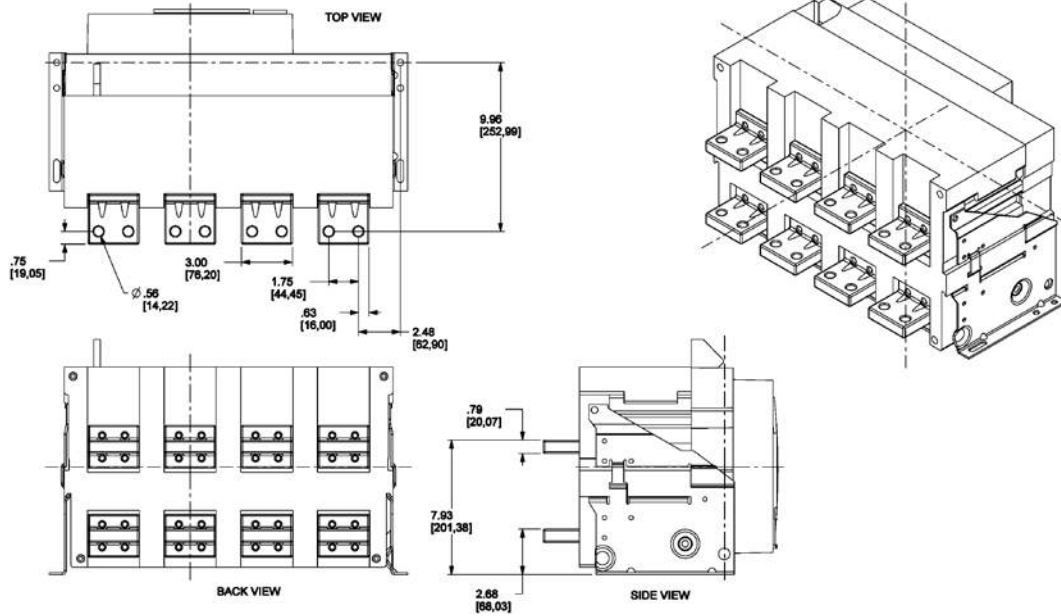
Note: dimensions in square brackets are in mm and other dimensions are in inches.



Connections

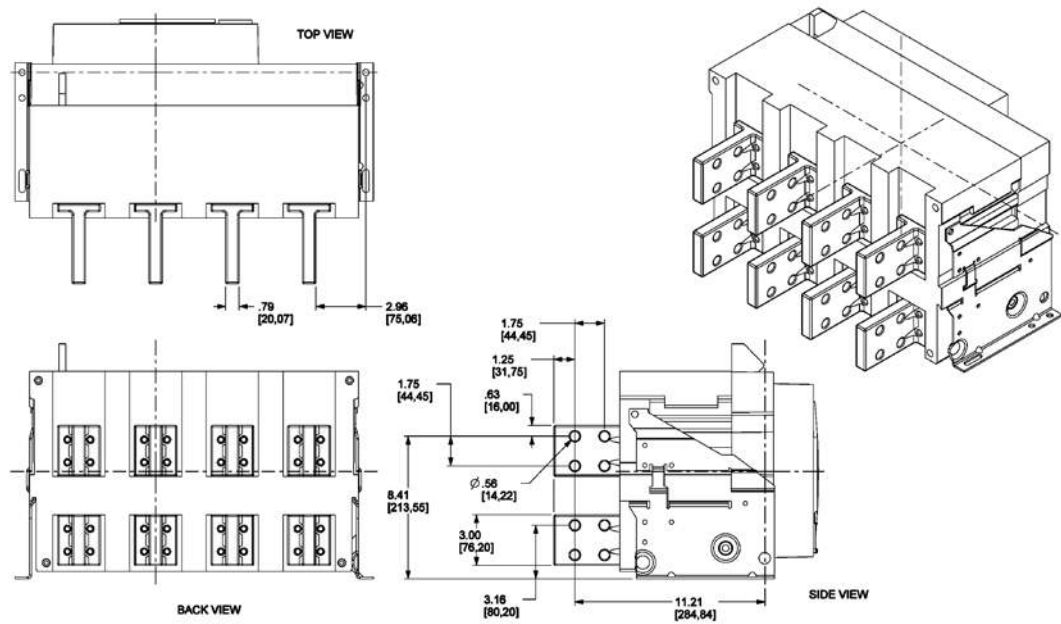
Horizontal rear connection from 800 A to 2000 A

48096A-261-01



Vertical rear connection from 2500 A to 3000 A

48096A-304-01



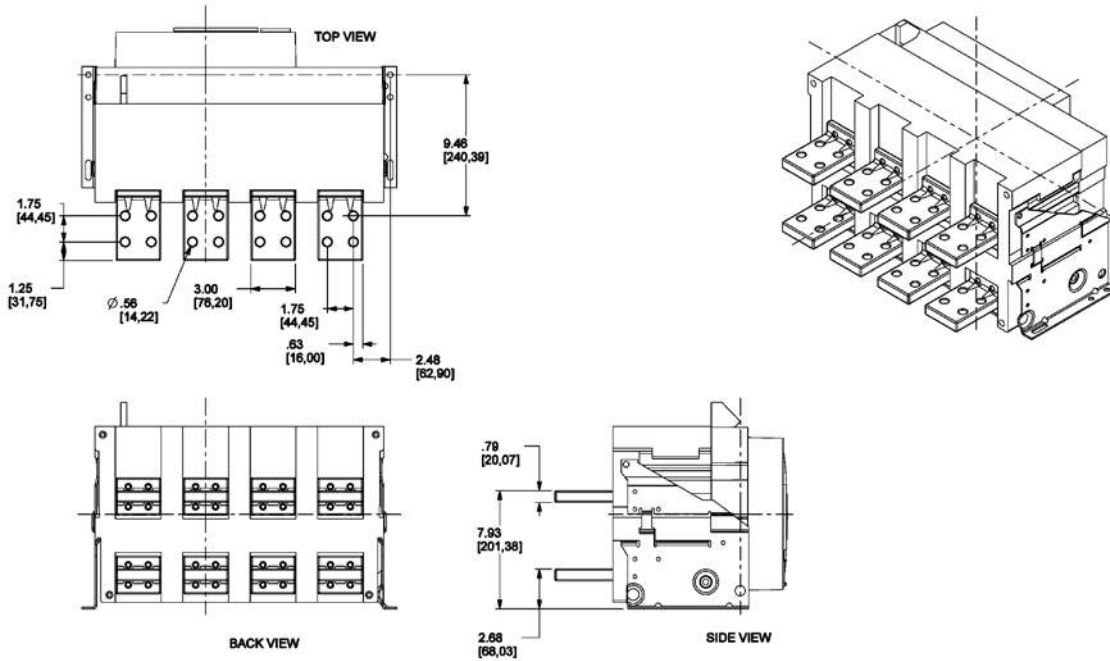
Note: dimensions in square brackets are in mm and other dimensions are in inches.



Connections

Horizontal rear connection from 2500 A to 3000 A

4809EA-305-01



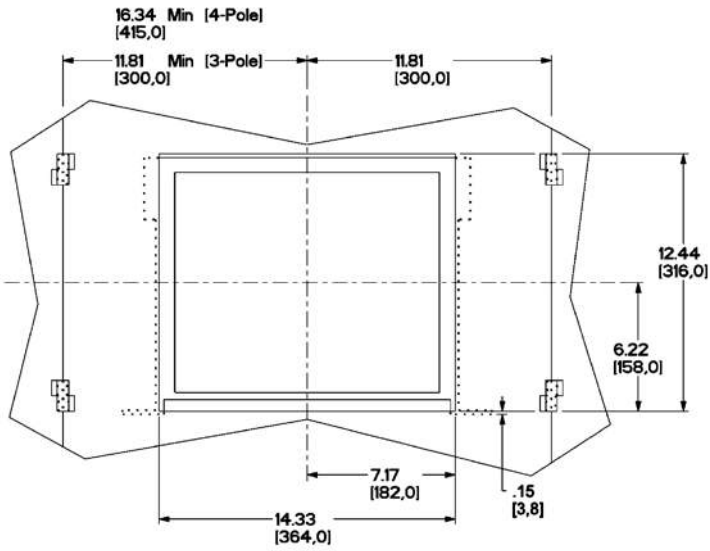
Note: dimensions in square brackets are in mm and other dimensions are in inches.



Connections

Door cutout from 800 A to 3000 A

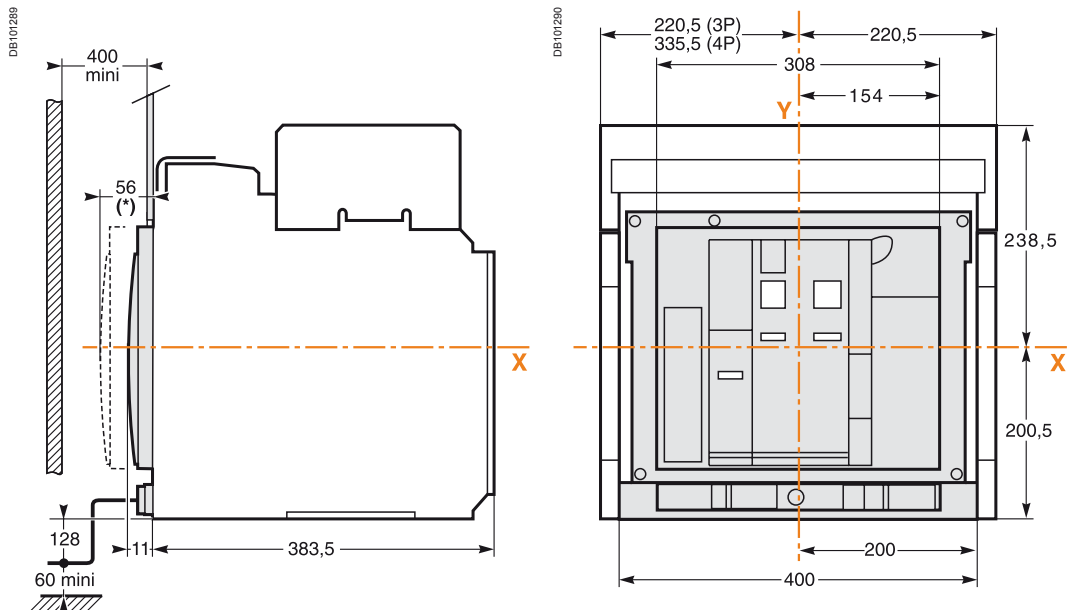
4809EA-300-01



Note: dimensions in square brackets are in mm and other dimensions are in inches.

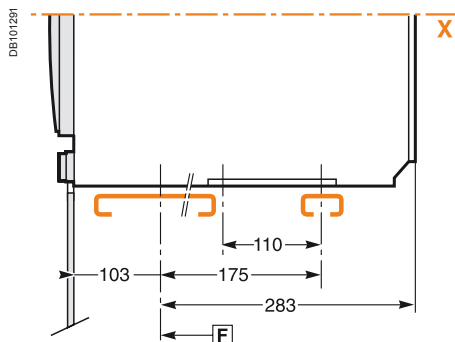


Dimensions

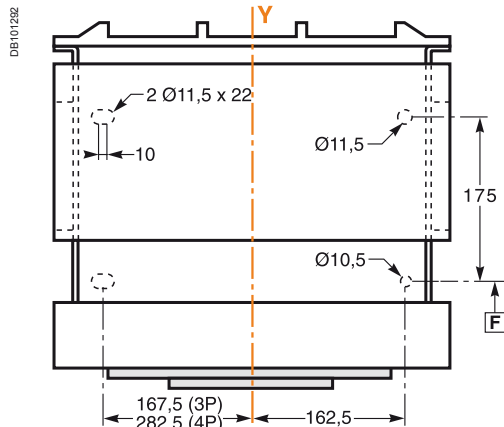


(*) Disconnected position.

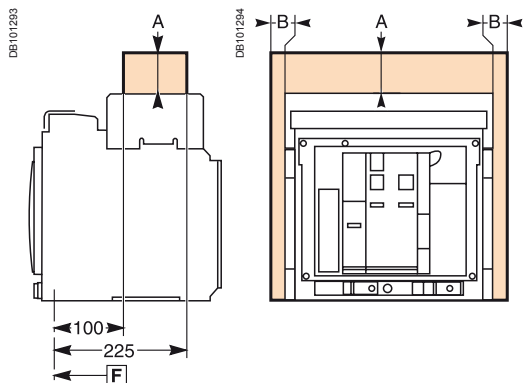
Mounting on base plate or rails



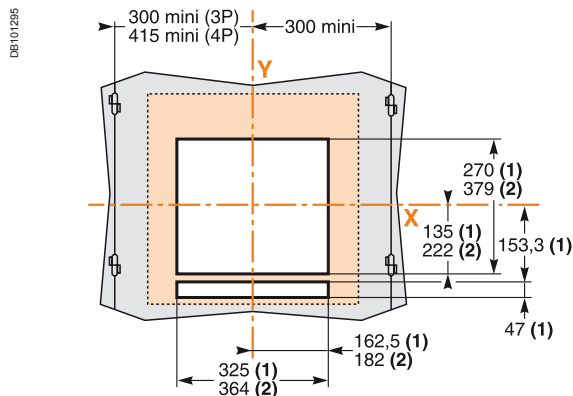
Mounting detail



Safety clearances



Door cutout



F : datum.

(1) Without escutcheon.
(2) With escutcheon.

Note: X and Y are the symmetry planes for a 3-pole device.

	Parts		
	Insulated	Metal	Energised
A	0	0	0
B	0	0	60

Note: dimensions in mm.



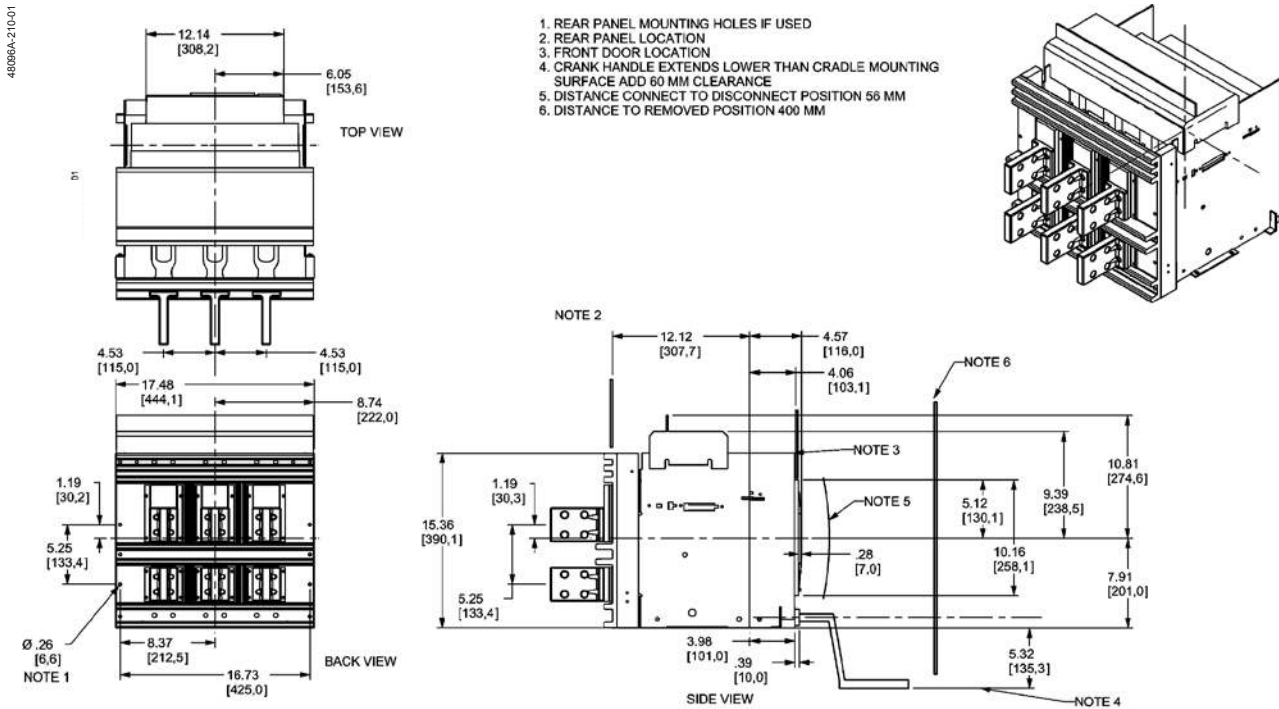
Drawout 3-pole device

Dimensions of Masterpact NW 3P

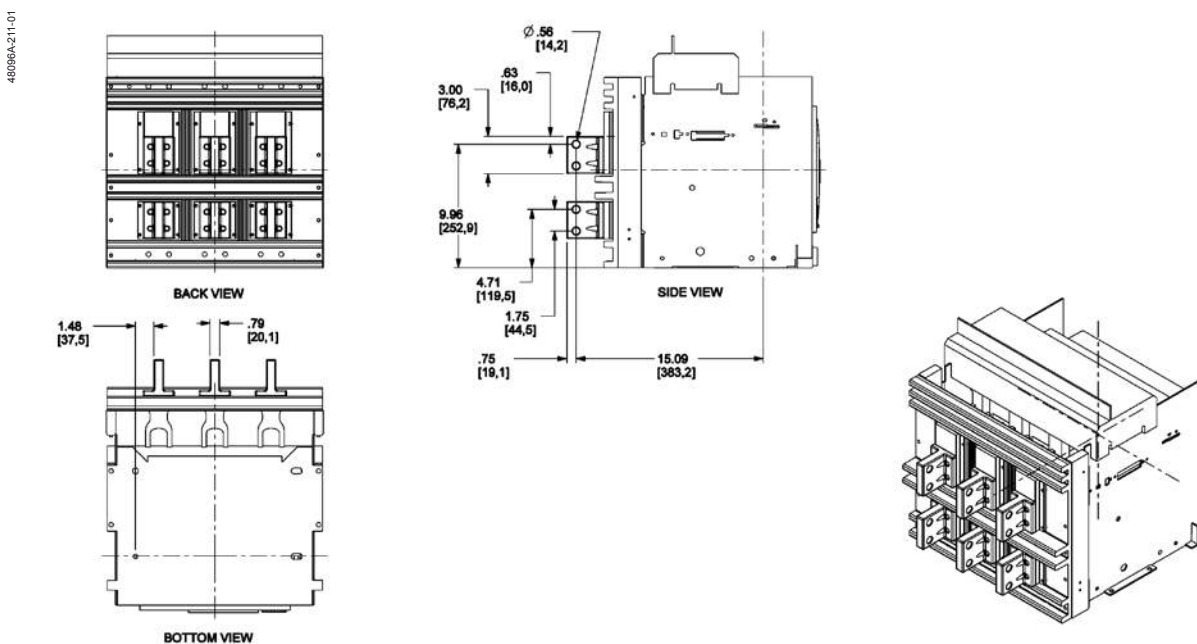
Number of poles	Rating	Dimension (H x W x D)		Vent areas		Bottom	
		In	mm	Top In ²	mm ²	In ²	mm ²
3P	Up to 3000 A	18.37 x 24 x 15.75	466.6 x 609.6 x 400	16.62	10720	16.62	10720
	4000 A and 5000 A	21.75 x 36 x 15.75	552.5 x 914.4 x 400	16.62	10720	16.62	10720

Connections

General dimensions for all versions



Vertical rear connection from 800 A to 2000 A



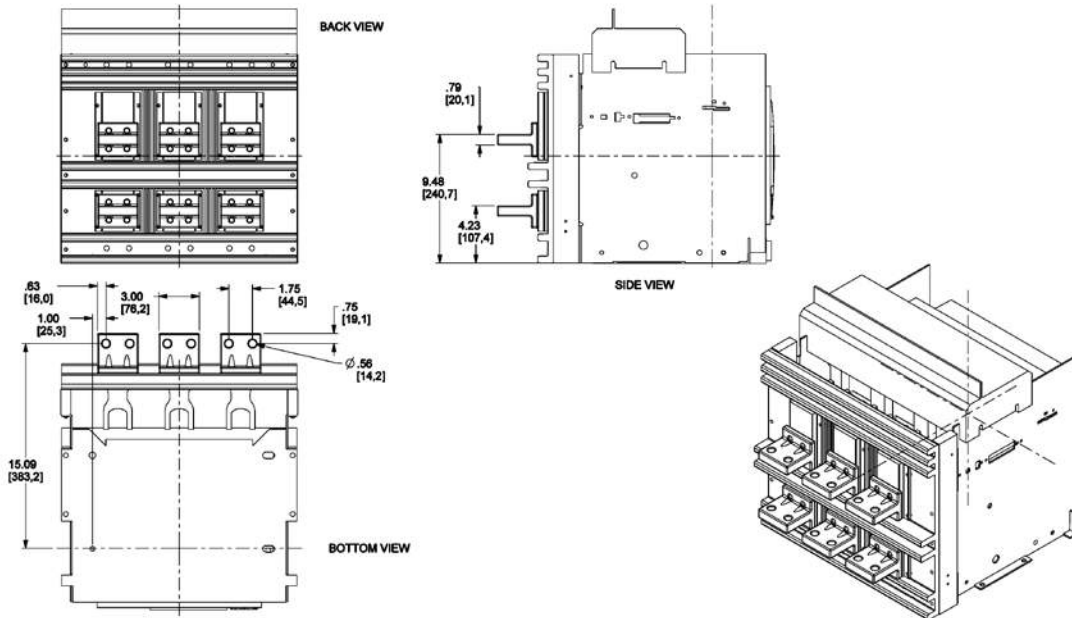
Note: dimensions in square brackets are in mm and other dimensions are in inches.



Connections

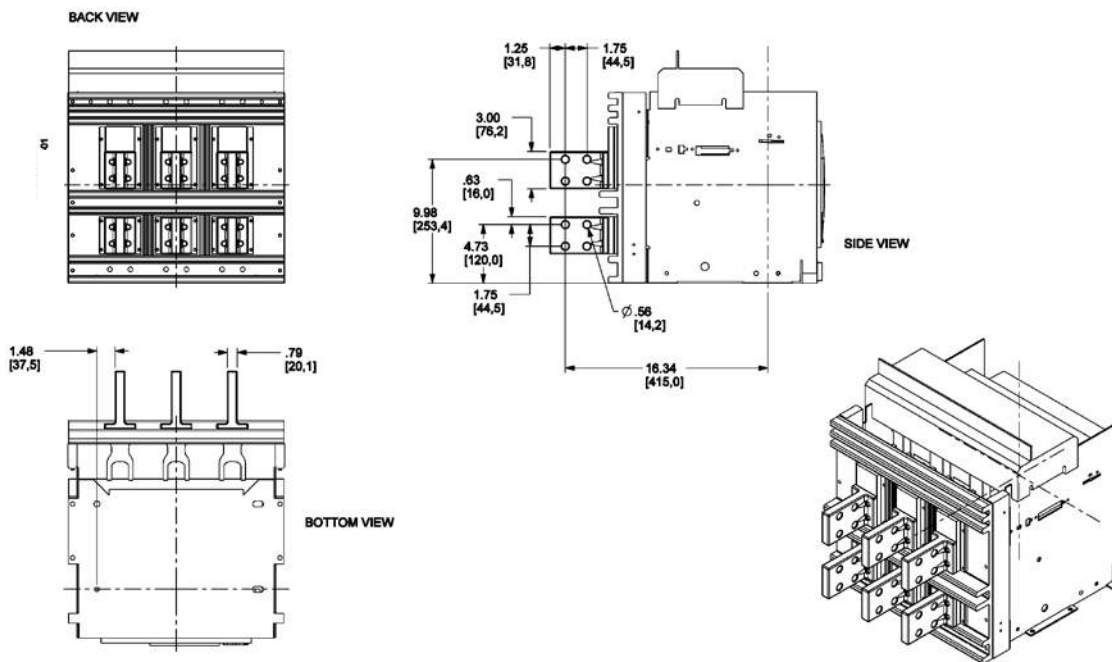
Horizontal rear connection from 800 A to 2000 A

4809BA-217-01



Vertical rear connection from 2500 A to 3000 A

4809BA-217-01



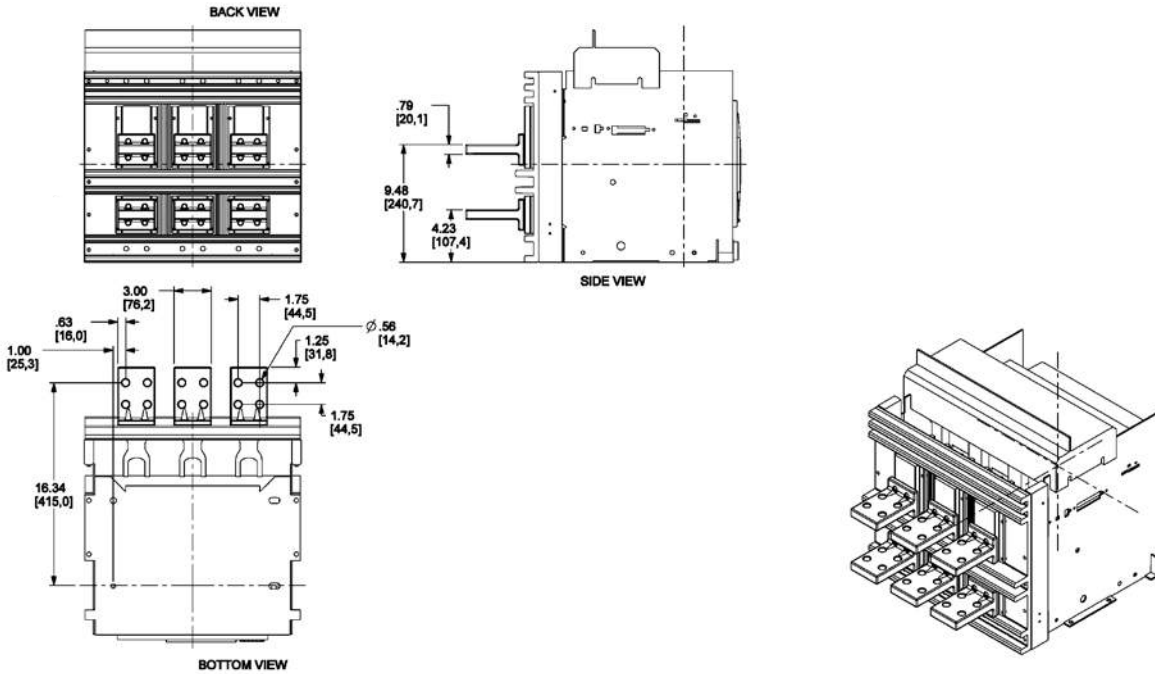
Note: dimensions in square brackets are in mm and other dimensions are in inches.



Connections

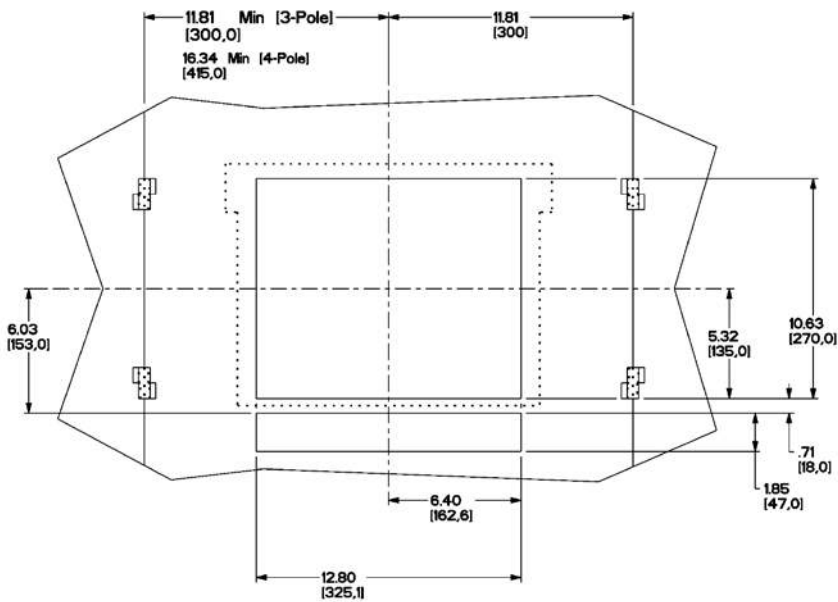
Horizontal rear connection from 2500 A to 3000 A

4800BA-213-01



Door cutout from 800 A to 3000 A

4800BA-225-01



Note: dimensions in square brackets are in mm and other dimensions are in inches.

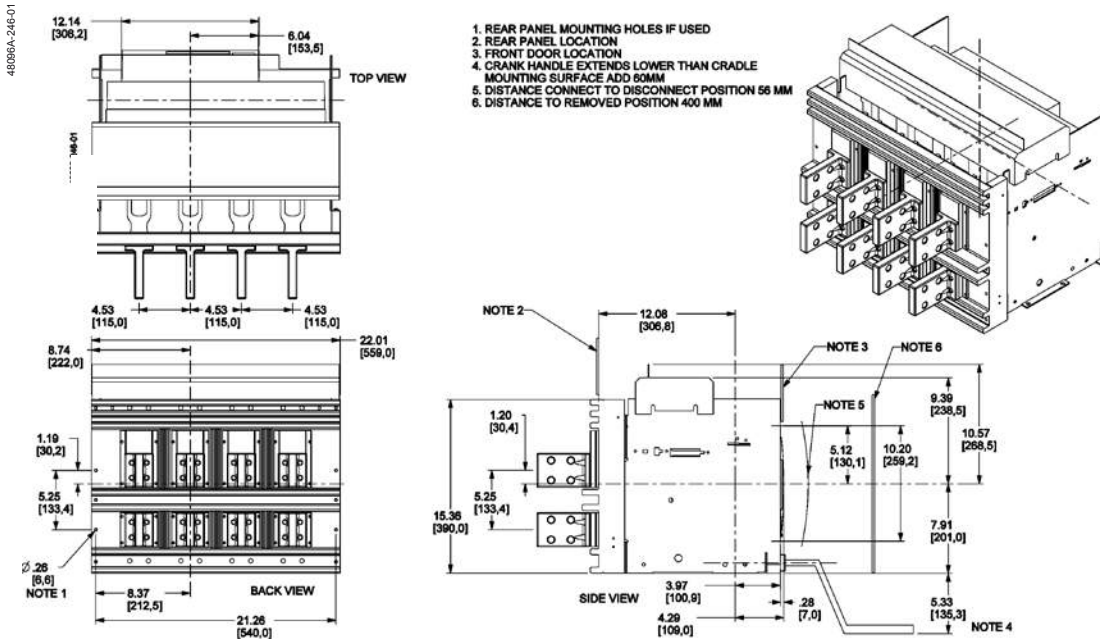


Dimensions of Masterpact NW 4P

Number of poles	Rating	Dimension (H x W x D)		Vent areas Top		Bottom	
		In	mm	In ²	mm ²	In ²	mm ²
4P	Up to 3000 A	18.37 x 30 x 15.75	466.6 x 762.0 x 400	16.62	10720	16.62	10720
	4000 A and 5000 A	21.75 x 45 x 15.75	552.5 x 1168.4 x 400	16.62	10720	16.62	10720

Connections

General dimensions for all versions



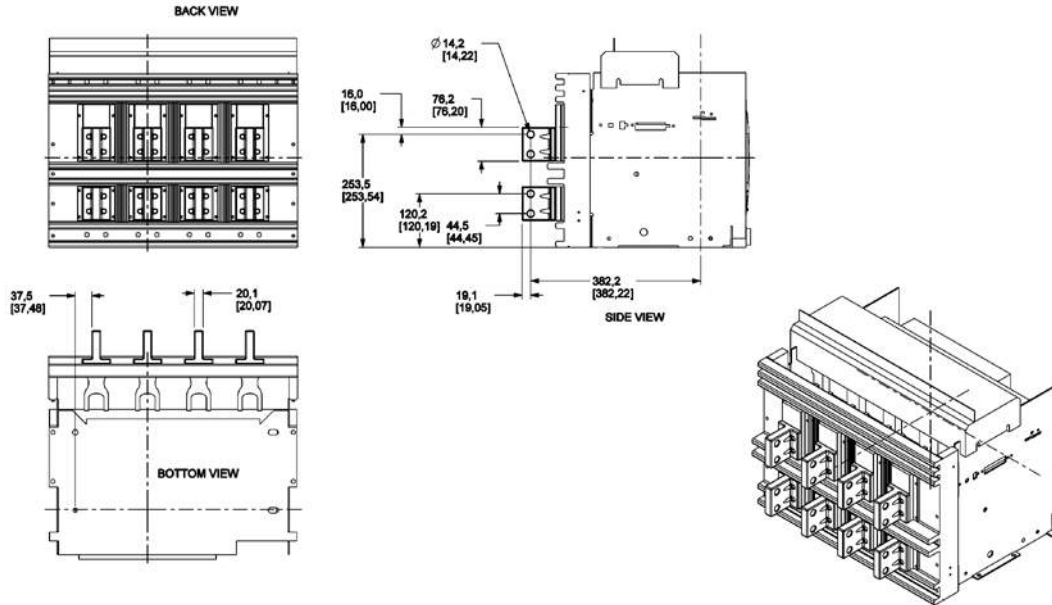
Note: dimensions in square brackets are in mm and other dimensions are in inches.



Connections

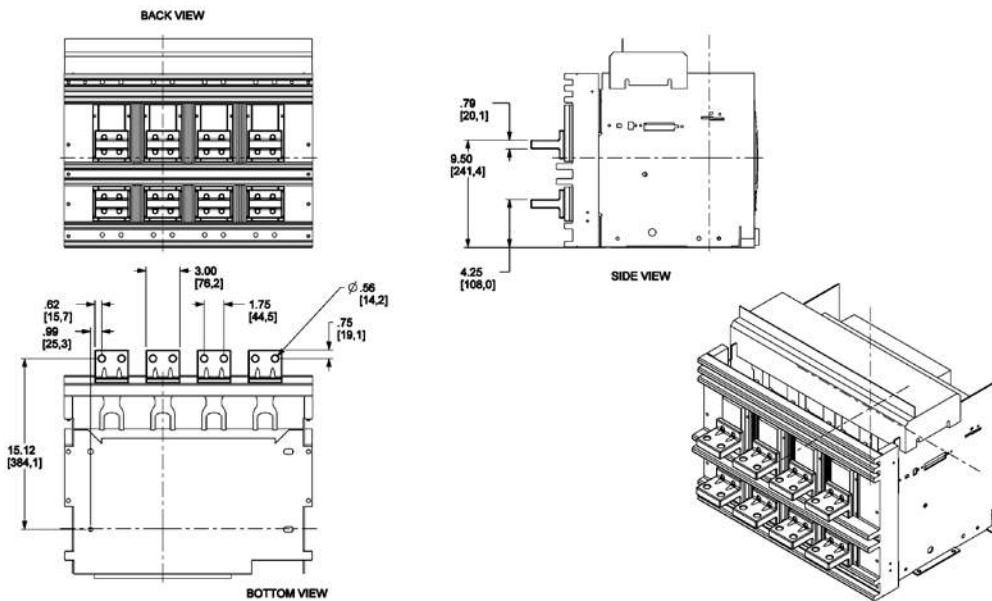
Vertical rear connection from 800 A to 3000 A

4809EA-255-01



Horizontal rear connection from 800 A to 3000 A

4809EA-255-01



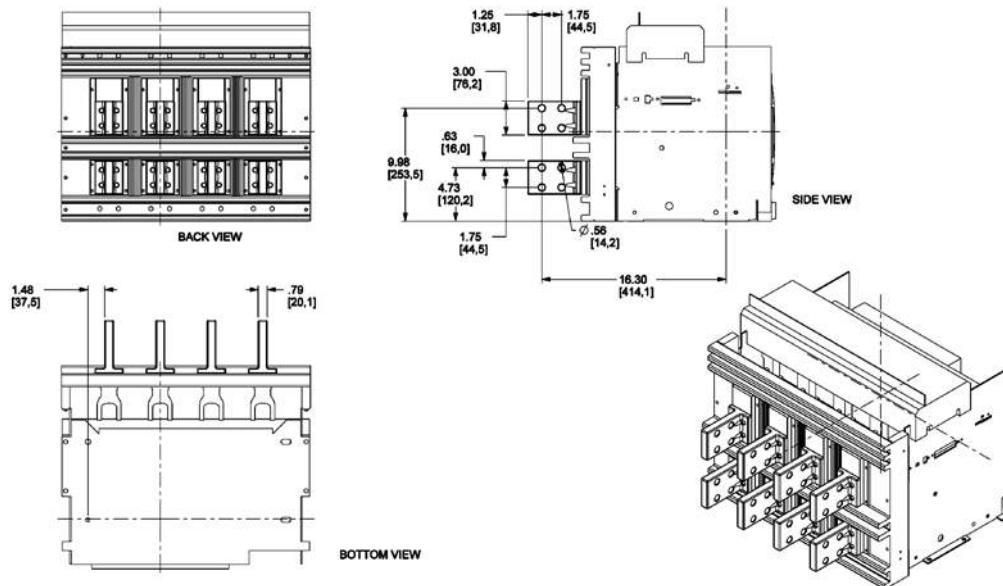
Note: dimensions in square brackets are in mm and other dimensions are in inches.



Connections

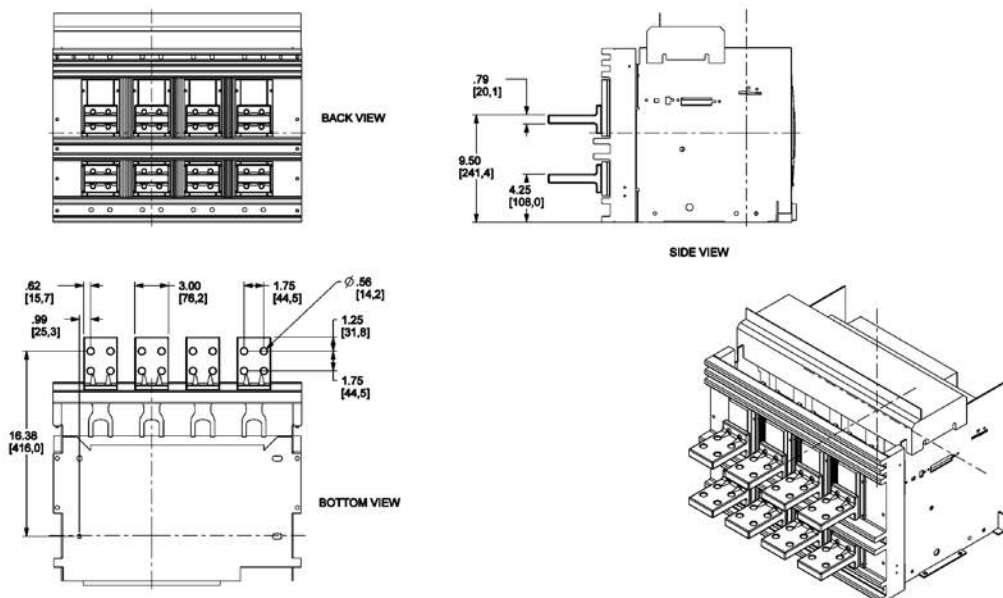
Vertical rear connection from 2500 A to 3000 A

4809EA-302-01



Horizontal rear connection from 2500 A to 3000 A

4809EA-255-01



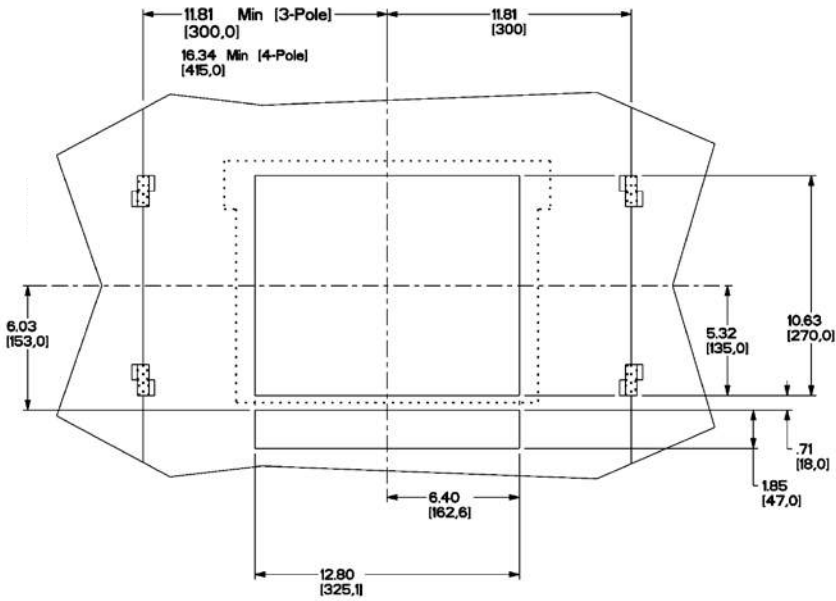
Note: dimensions in square brackets are in mm and other dimensions are in inches.



Connections

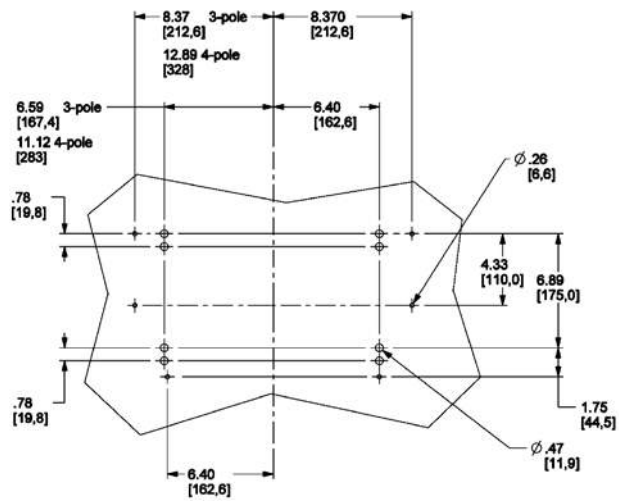
Door cutout from 800 A to 3000 A

46096A-225-01



Chassis mounting from 800 A to 3000 A

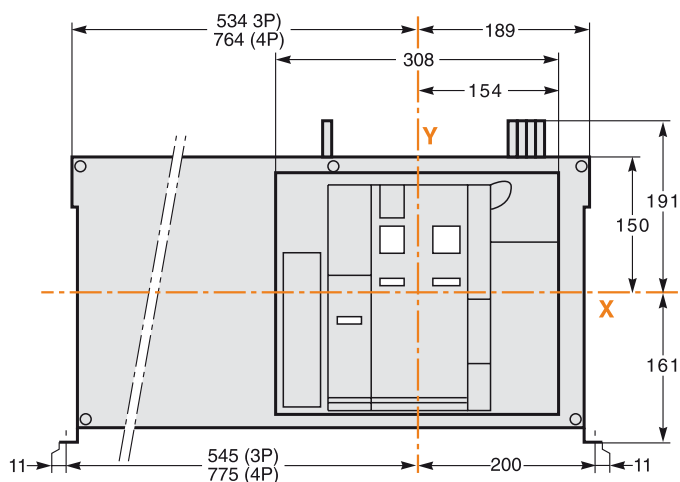
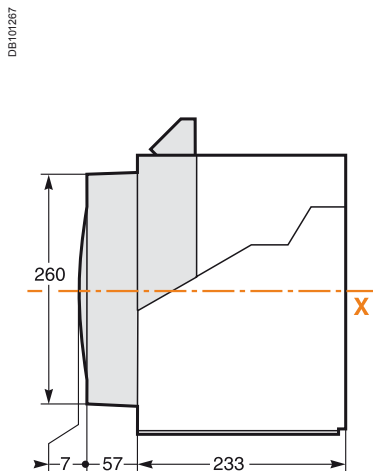
DB109033A



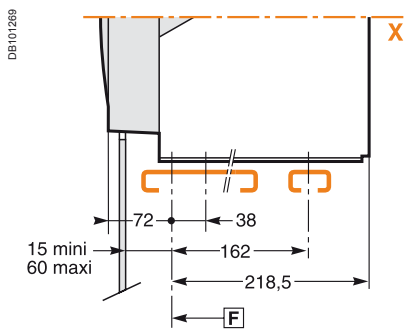
Note: dimensions in square brackets are in mm and other dimensions are in inches.



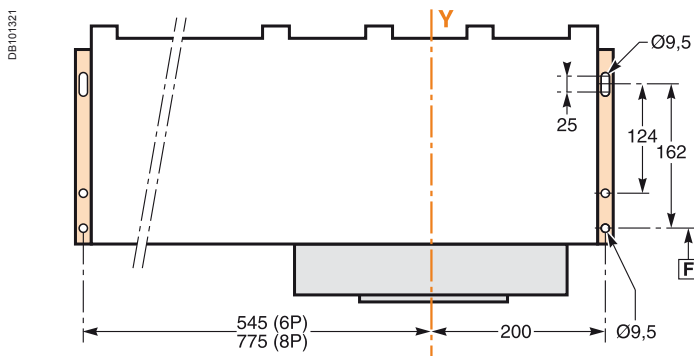
Dimensions



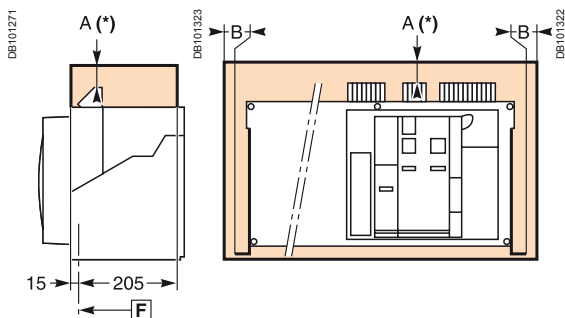
Mounting on base plate or rails



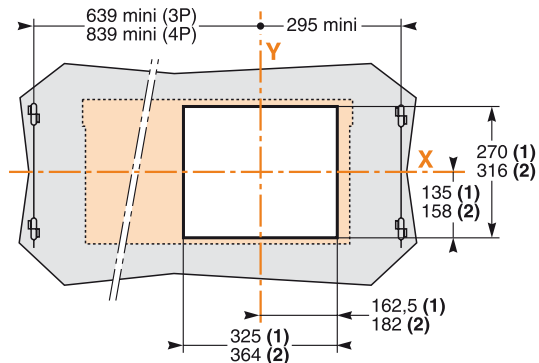
Mounting detail



Safety clearances



Door cutout



	Parts		Energised
	Insulated	Metal	
A	0	0	100
B	0	0	60

Note: dimensions in mm.

F : datum.

(1) Without escutcheon.
(2) With escutcheon.

Note: X and Y are the symmetry planes for a 3-pole device.

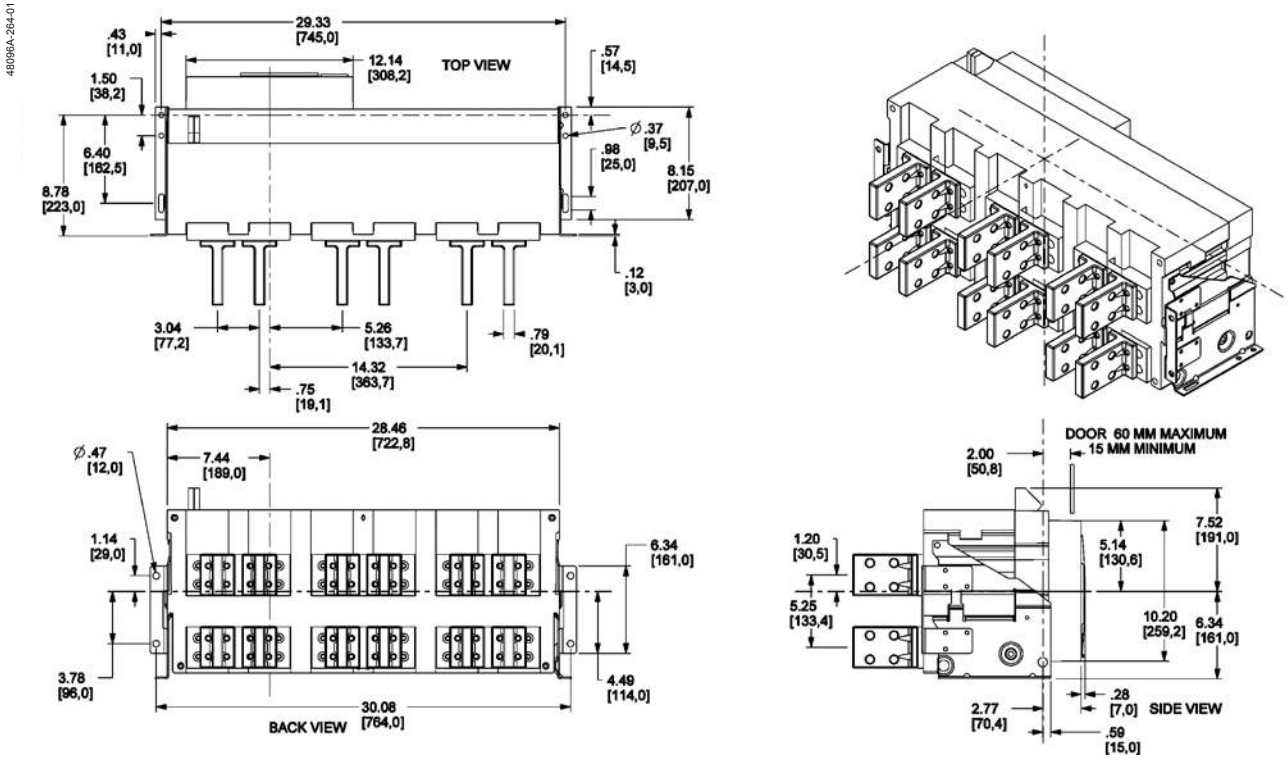
A(*) An overhead clearance of 110 mm is required to remove the arc chutes.
An overhead clearance of 20 mm is required to remove the terminal block.



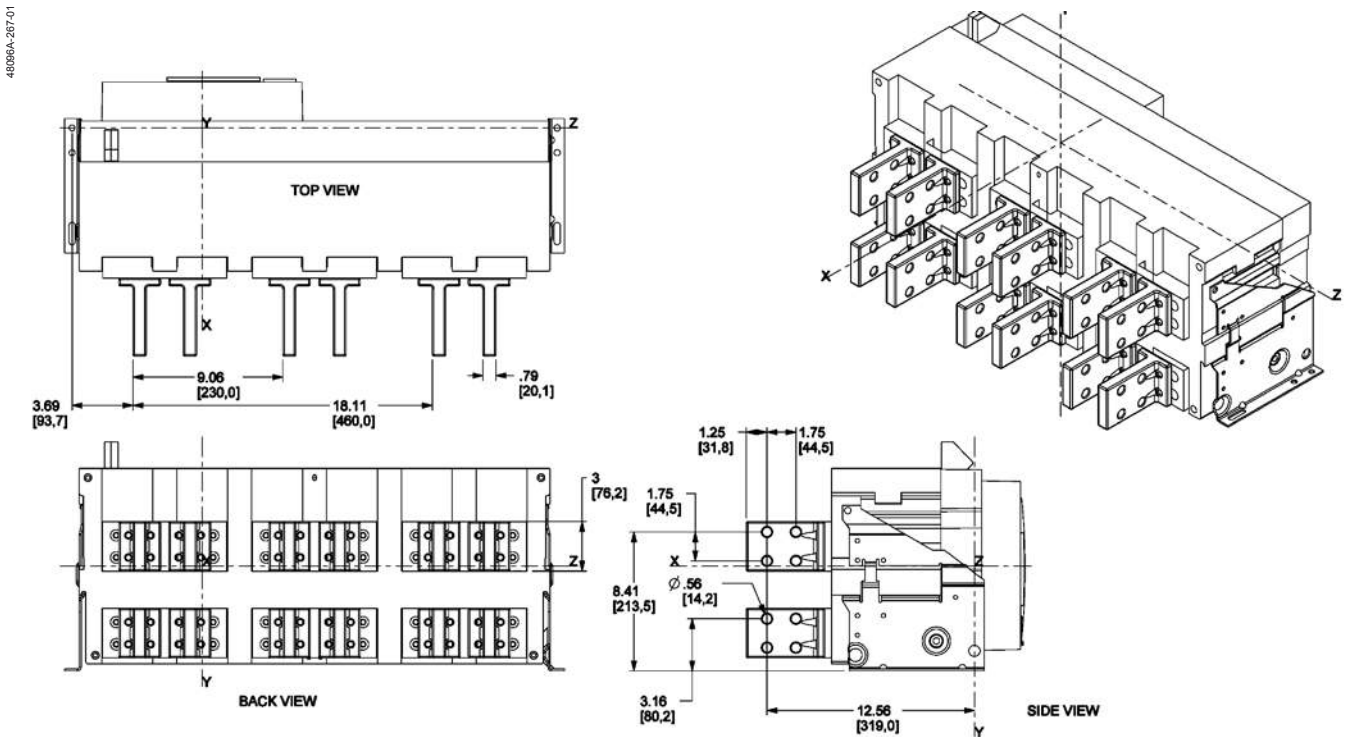
Fixed 3-pole device

Connections

General dimensions for all versions



Vertical rear connection 4000 A and 5000 A



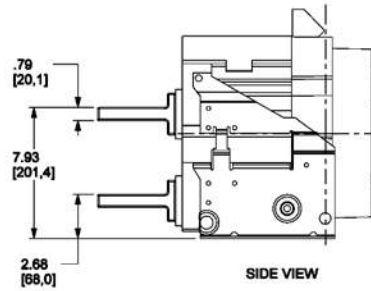
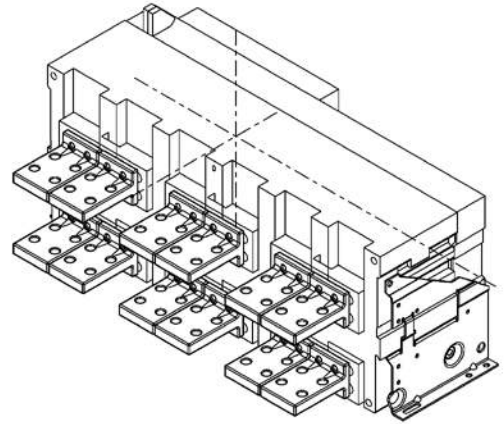
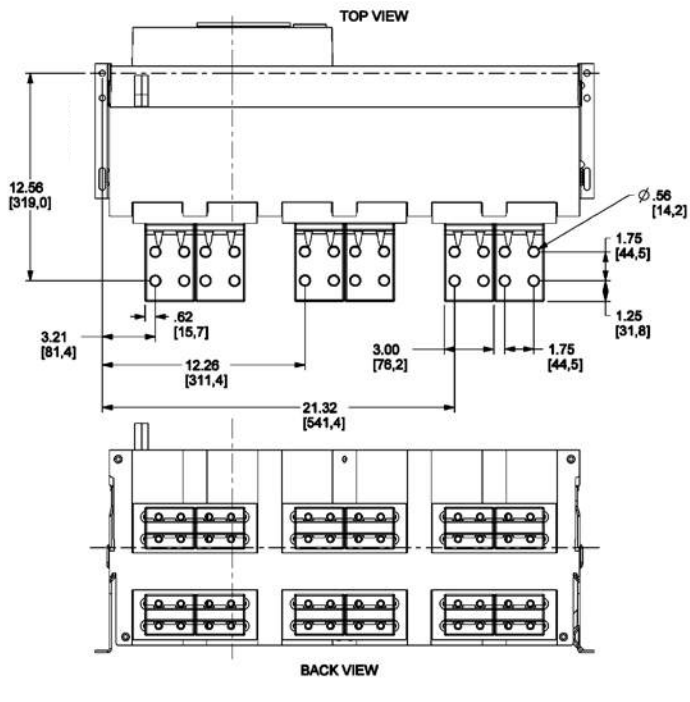
Note: dimensions in square brackets are in mm and other dimensions are in inches.



Connections

Horizontal rear connection 4000 A and 5000 A

4009EA-268-01



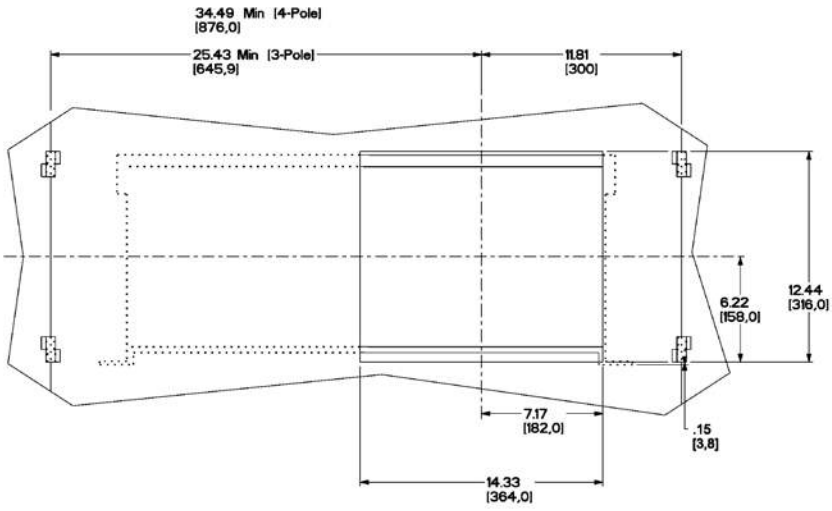
Note: dimensions in square brackets are in mm and other dimensions are in inches.



Connections

Door cutout 4000 A et 5000 A

48096A-307-01



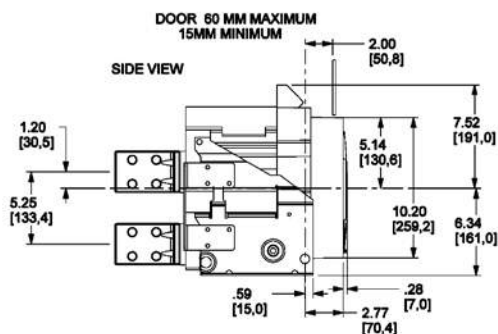
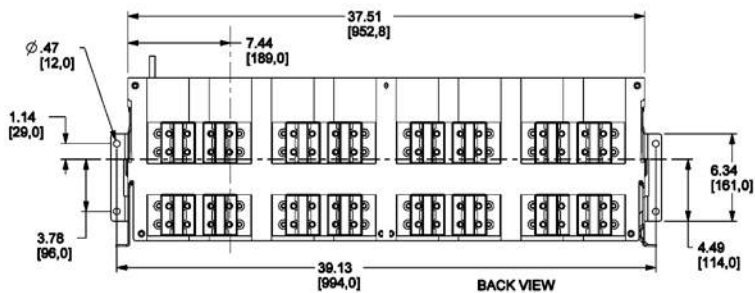
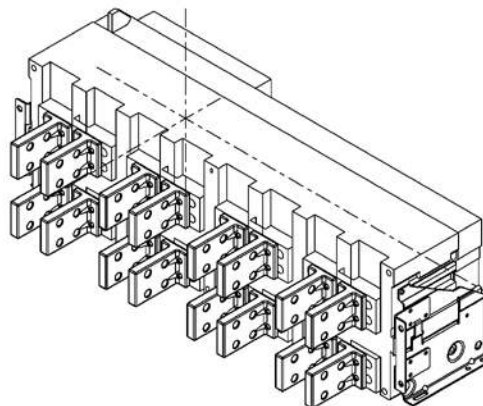
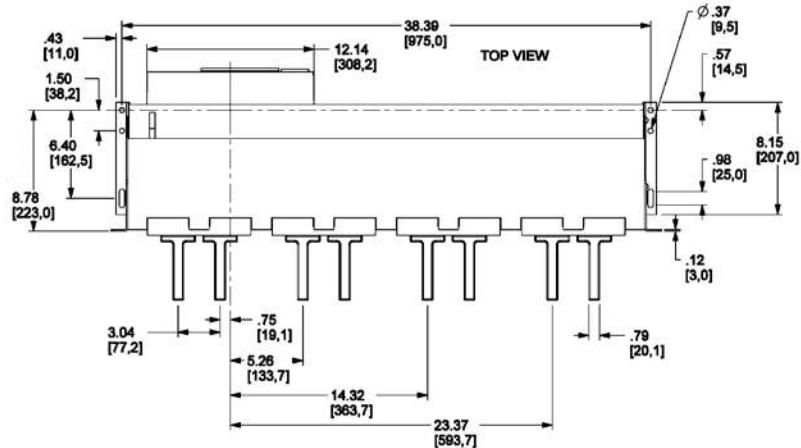
Note: dimensions in square brackets are in mm and other dimensions are in inches.



Connections

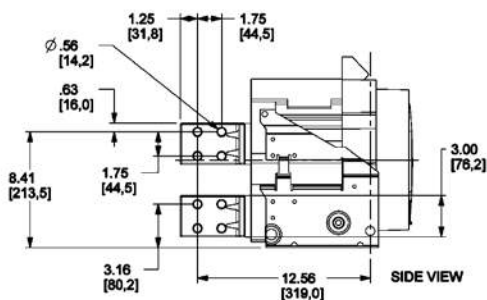
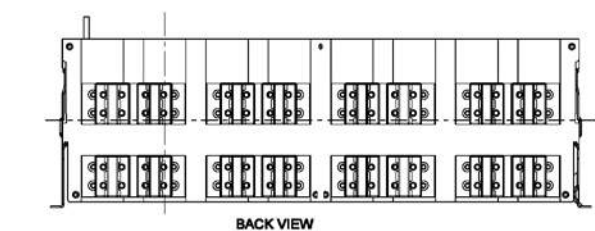
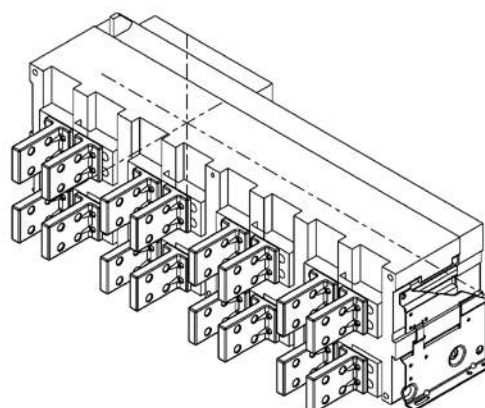
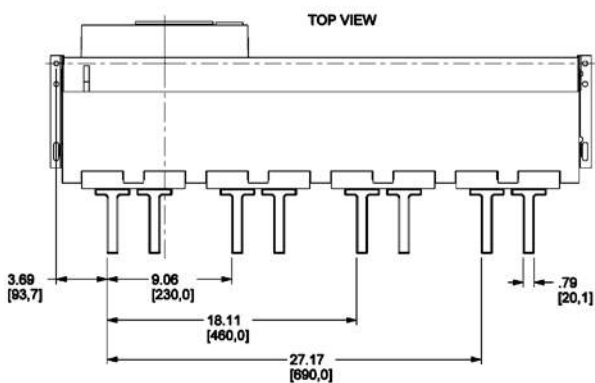
General dimensions for all versions

4809PA-265-01



Vertical rear connection 4000 A and 5000 A

4809PA-346-01



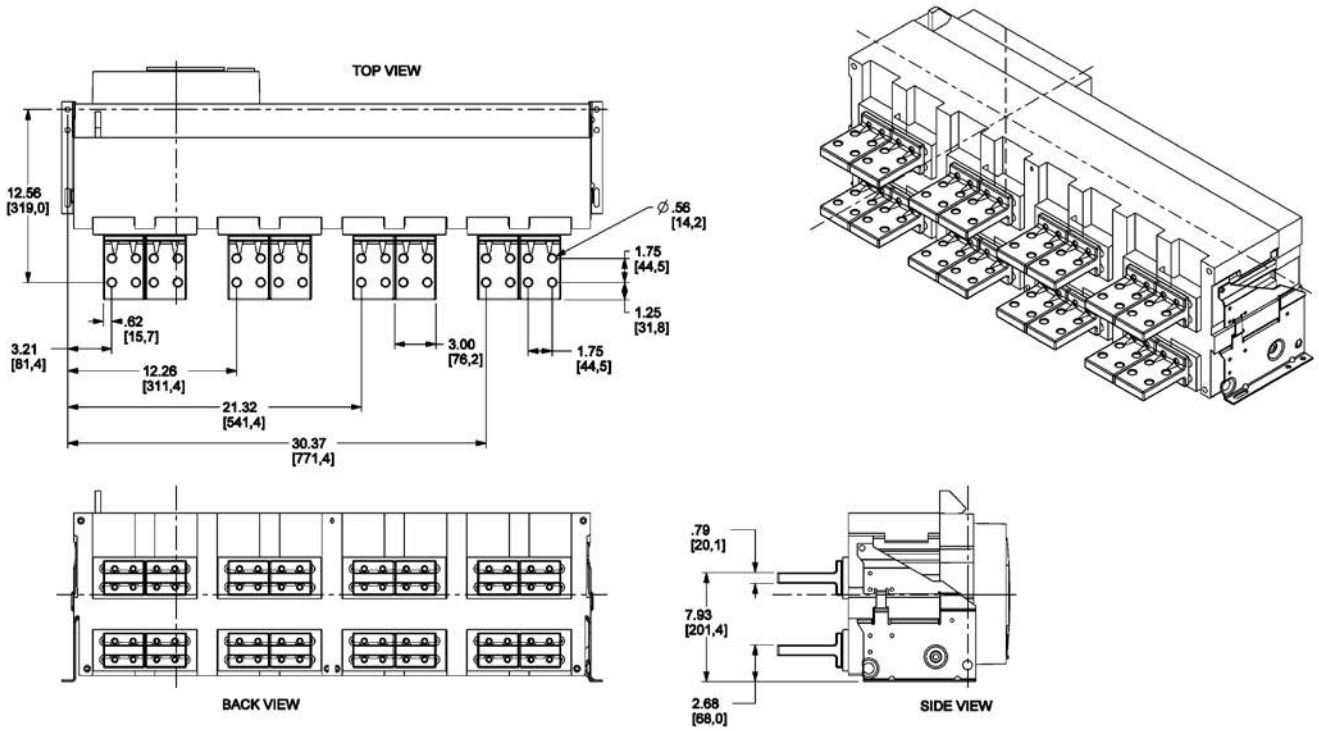
Note: dimensions in square brackets are in mm and other dimensions are in inches.



Connections

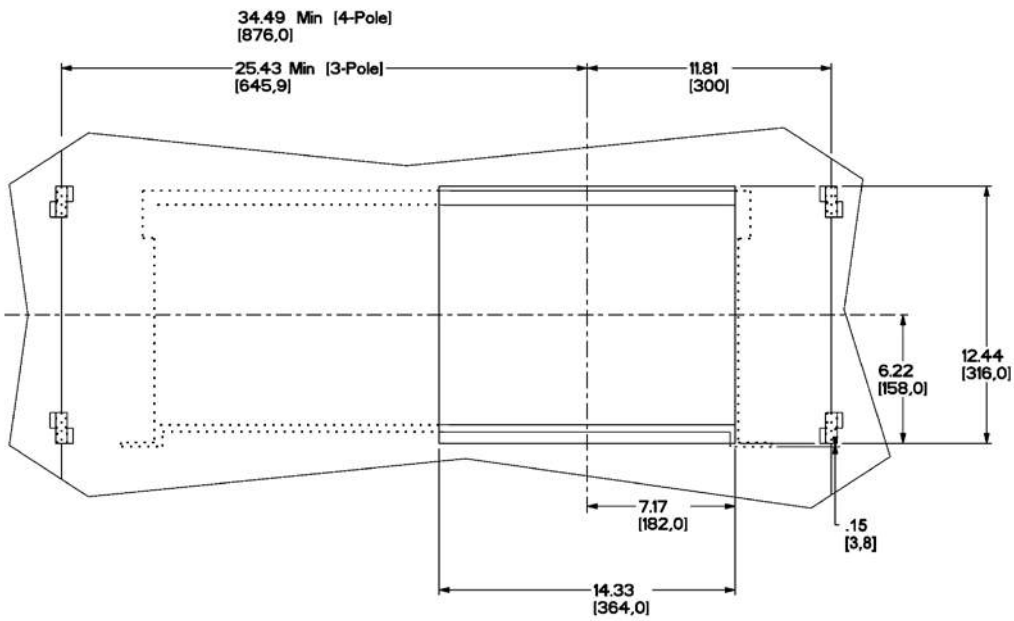
Horizontal rear connection 4000 A and 5000 A

4809BA-311-01



Door cutout 4000 A and 5000 A

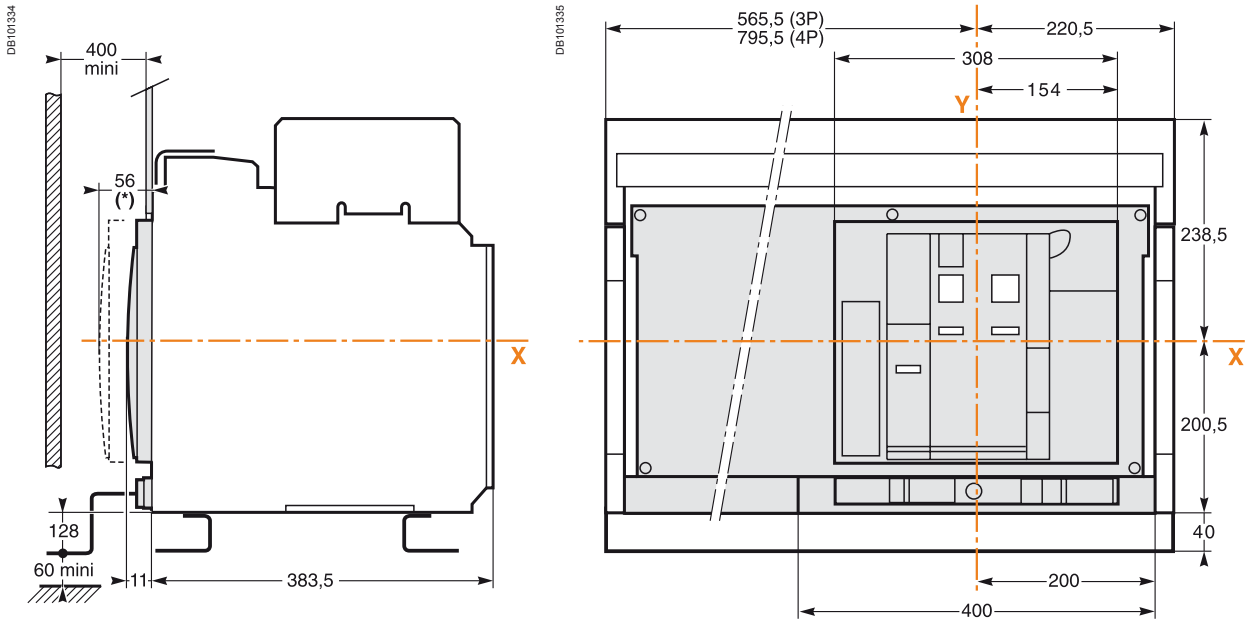
4809BA-307-01



Note: dimensions in square brackets are in mm and other dimensions are in inches.

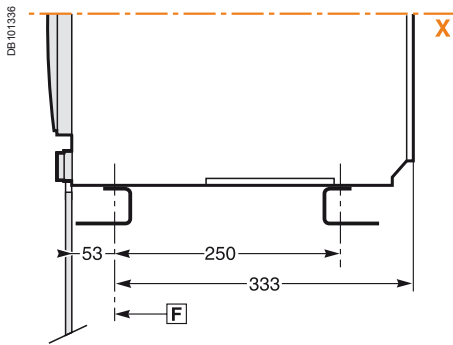


Dimensions

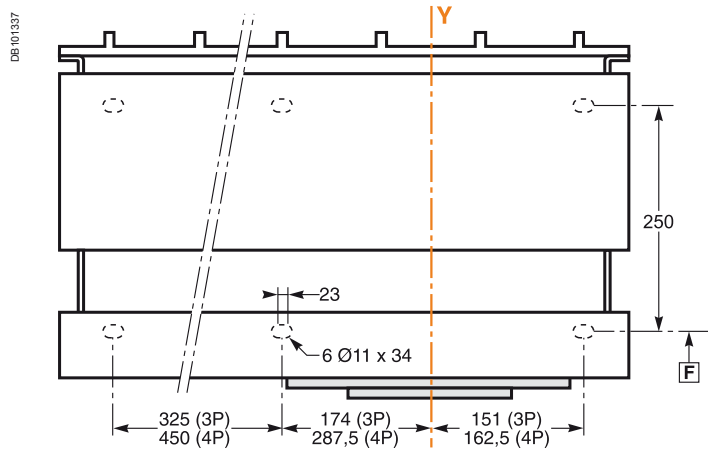


(*) Disconnected position.

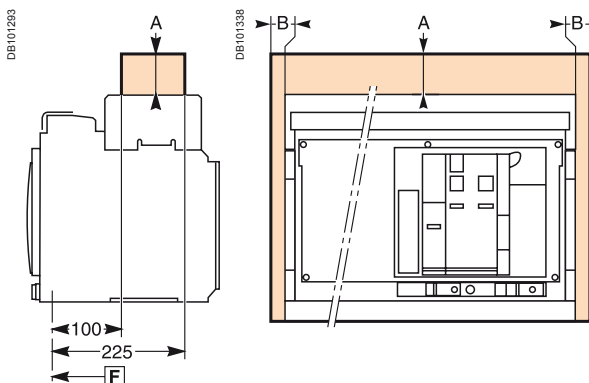
Mounting on base plate or rails



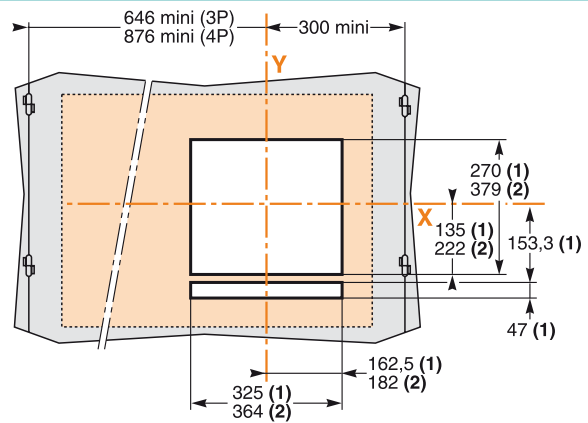
Mounting detail



Safety clearances



Door cutout



F : datum.

(1) Without escutcheon.
(2) With escutcheon.

Note: X and Y are the symmetry planes for a 3-pole device.

	Parts		
	Insulated	Metal	Energised
A	0	0	0
B	0	0	60

Note: dimensions in mm.

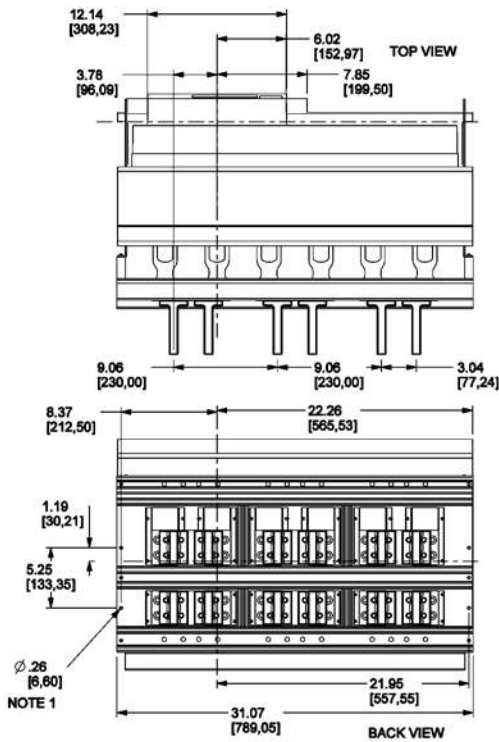


Drawout 3-pole device

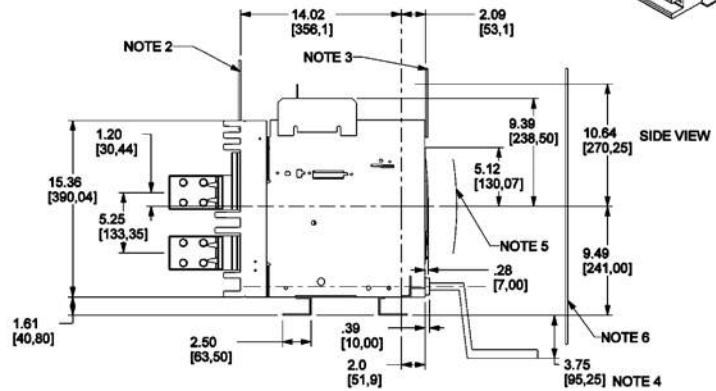
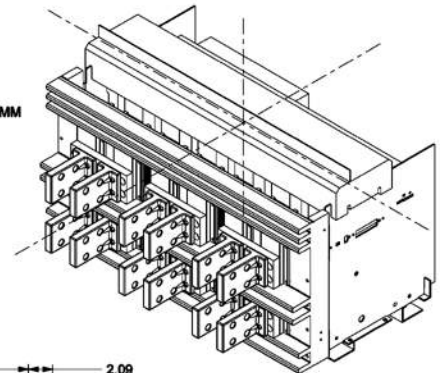
Connections

General dimensions for all versions

4809BA-21B-01

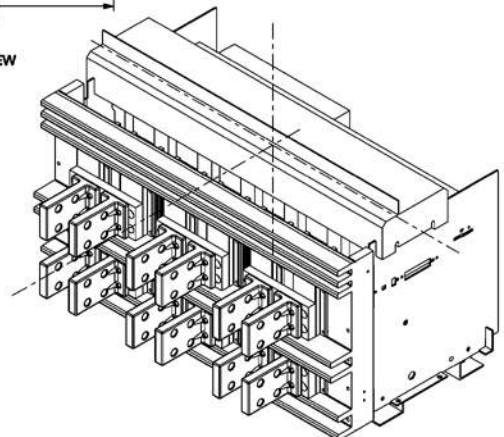
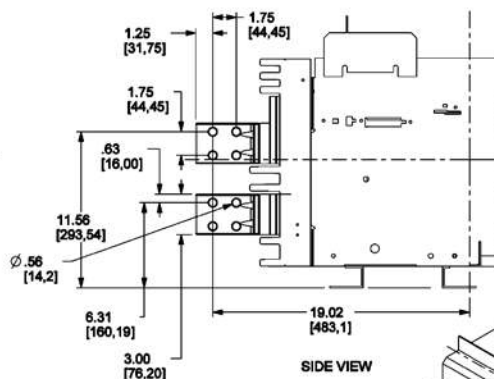
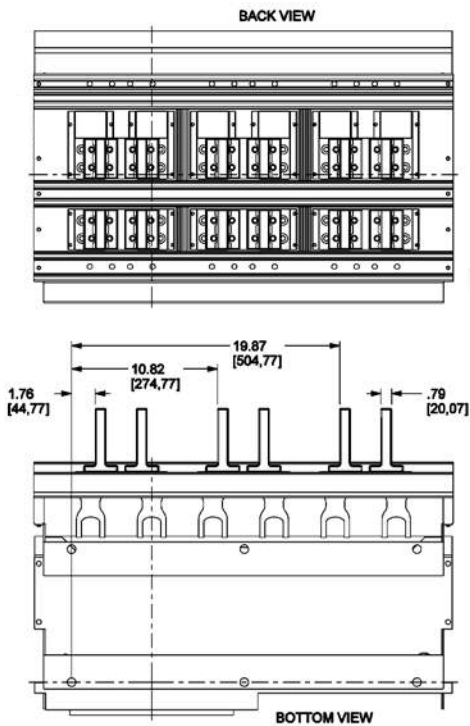


1. REAR MOUNTING PANEL HOLES IF USED
2. REAR PANEL LOCATION
3. FRONT DOOR LOCATION
4. CRANK HANDLE EXTENDS LOWER THAN CRADLE MOUNTING SURFACE ADD 60MM
5. DISTANCE CONNECT TO DISCONNECT POSITION 58MM
6. DISTANCE TO DRAWOUT POSITION 400MM



Vertical rear connection 4000 A and 5000 A

4809BA-21B-01



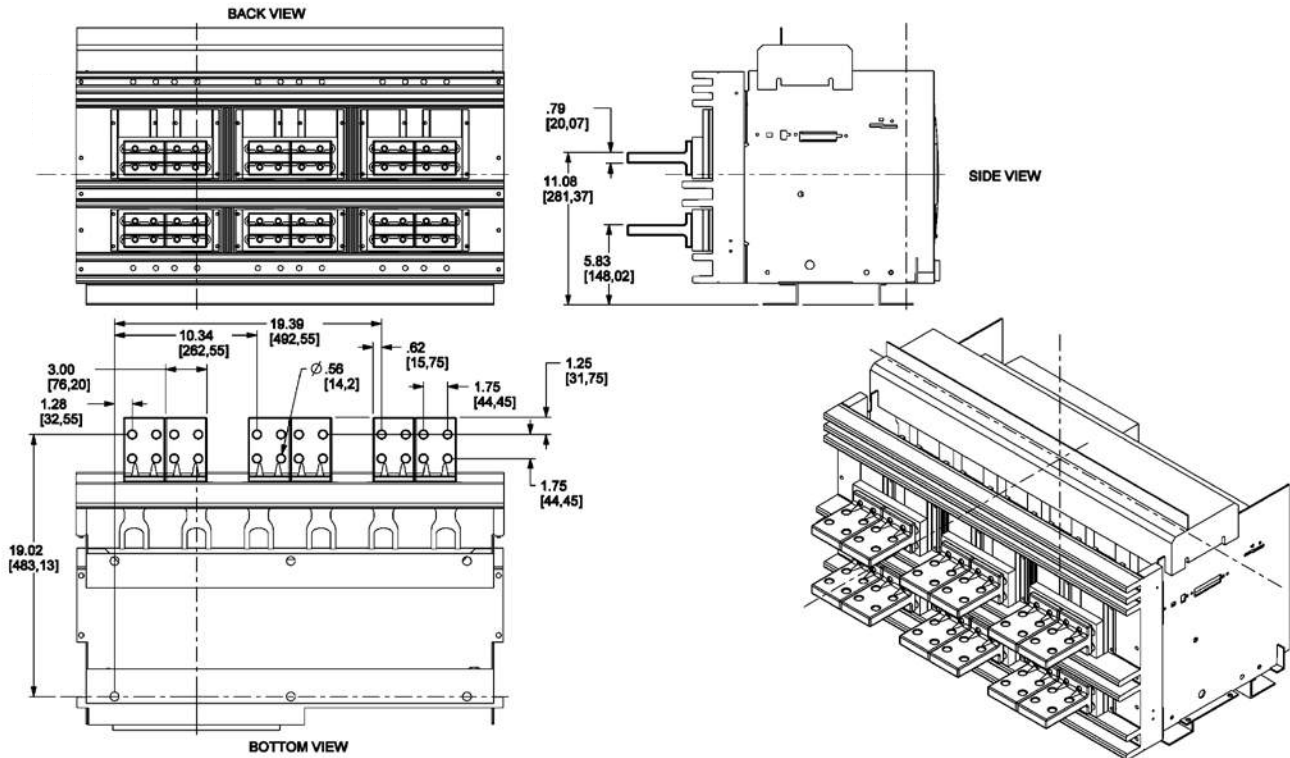
Note: dimensions in square brackets are in mm and other dimensions are in inches.



Connections

Horizontal rear connection 5000 A

4809EA-220-01



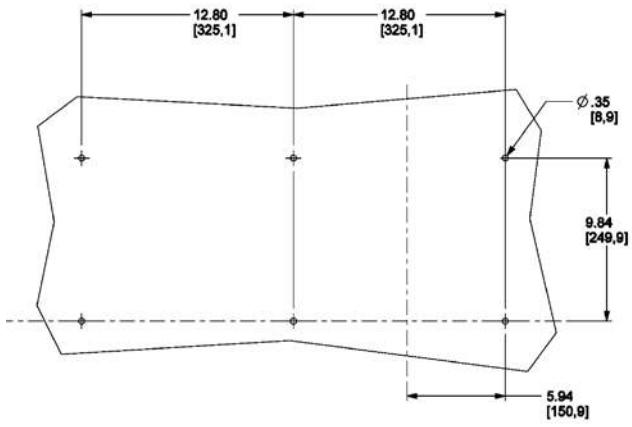
Note: dimensions in square brackets are in mm and other dimensions are in inches.



Connections

Cradle mounting from 4000 A and 5000 A

DB109034A



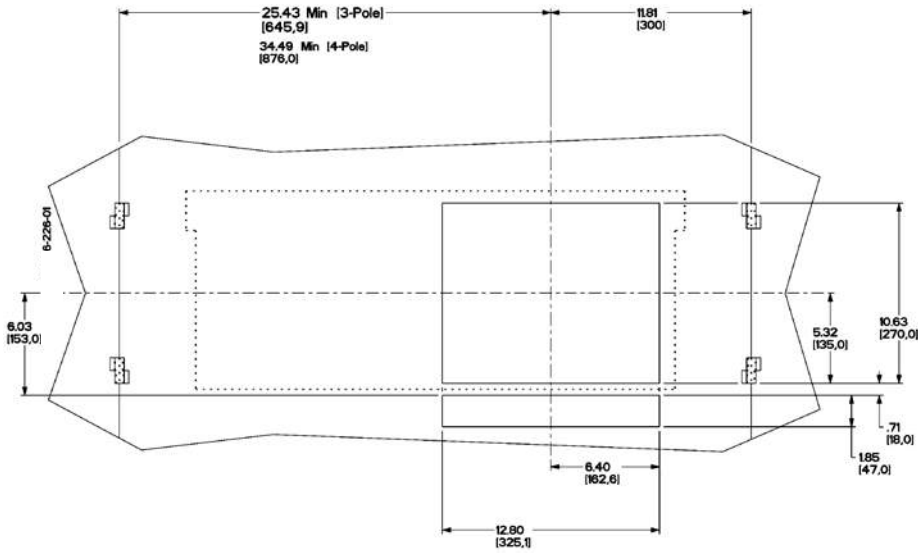
Note: dimensions in square brackets are in mm and other dimensions are in inches.



Connections

Door cutout 5000 A

4809PA-22E-01



Note: dimensions in square brackets are in mm and other dimensions are in inches.

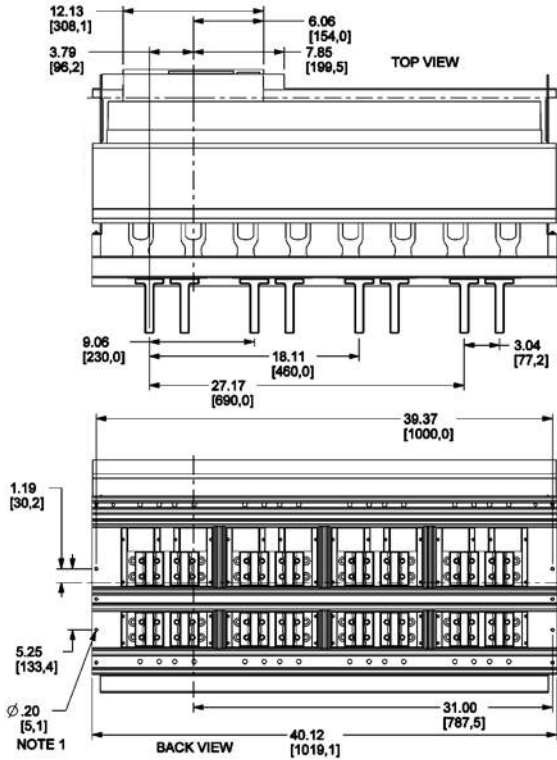


Drawout 4-pole device

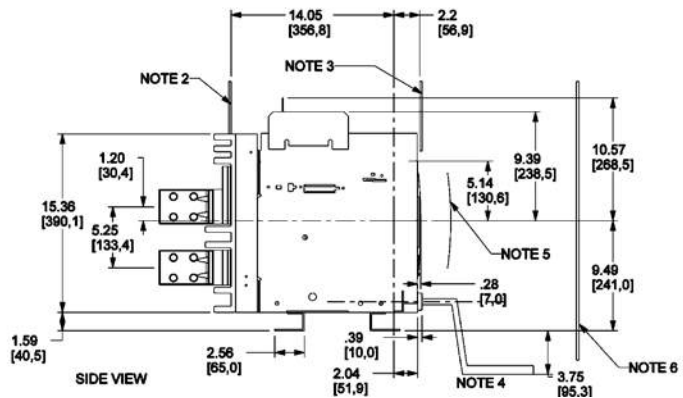
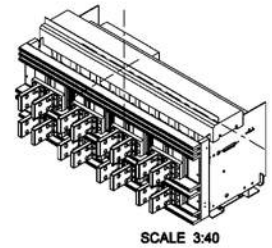
Connections

General dimensions for all versions

46096A-231-01



1. REAR MOUNTING PANEL HOLES IF USED
2. REAR PANEL LOCATION
3. FRONT DOOR LOCATION
4. CRANK HANDLE EXTENDS LOWER THAN CRADLE MOUNTING SURFACE ADD 60 MM
5. DISTANCE CONNECT TO DISCONNECT POSITION 56 MM
6. DISTANCE TO REMOVED POSITION 400 MM



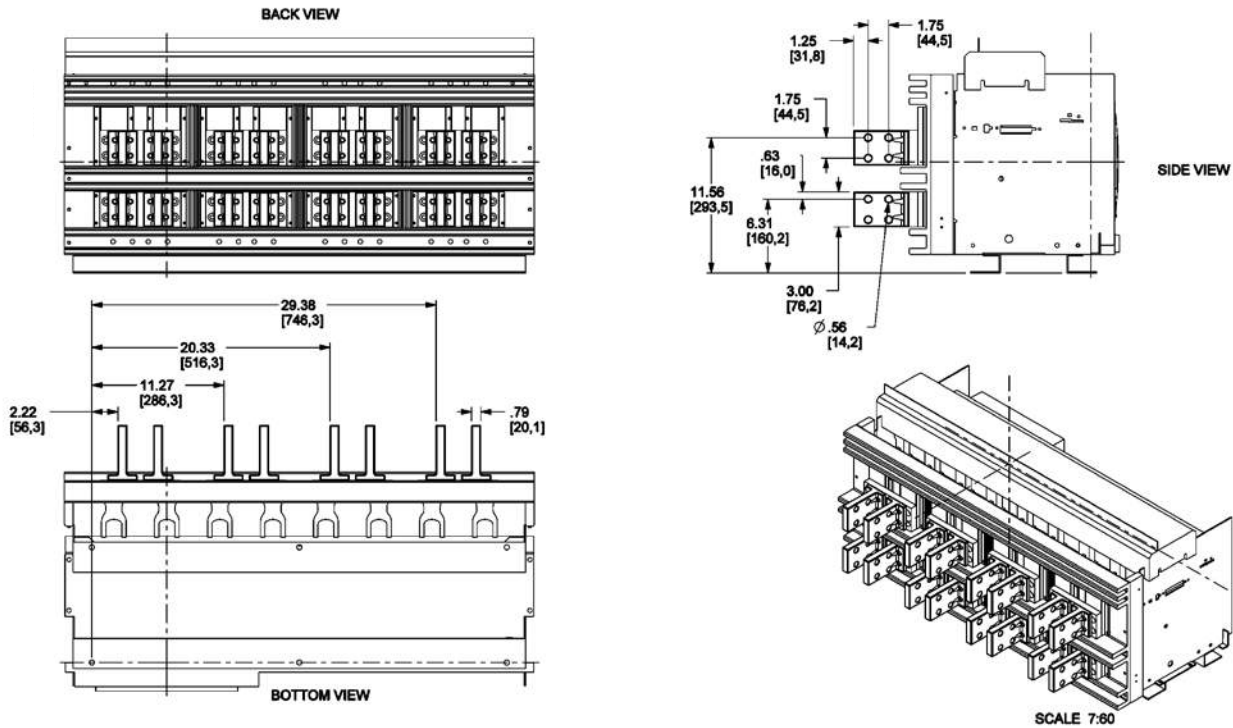
Note: dimensions in square brackets are in mm and other dimensions are in inches.



Connections

Vertical rear connection 5000 A

4809EA-243-01



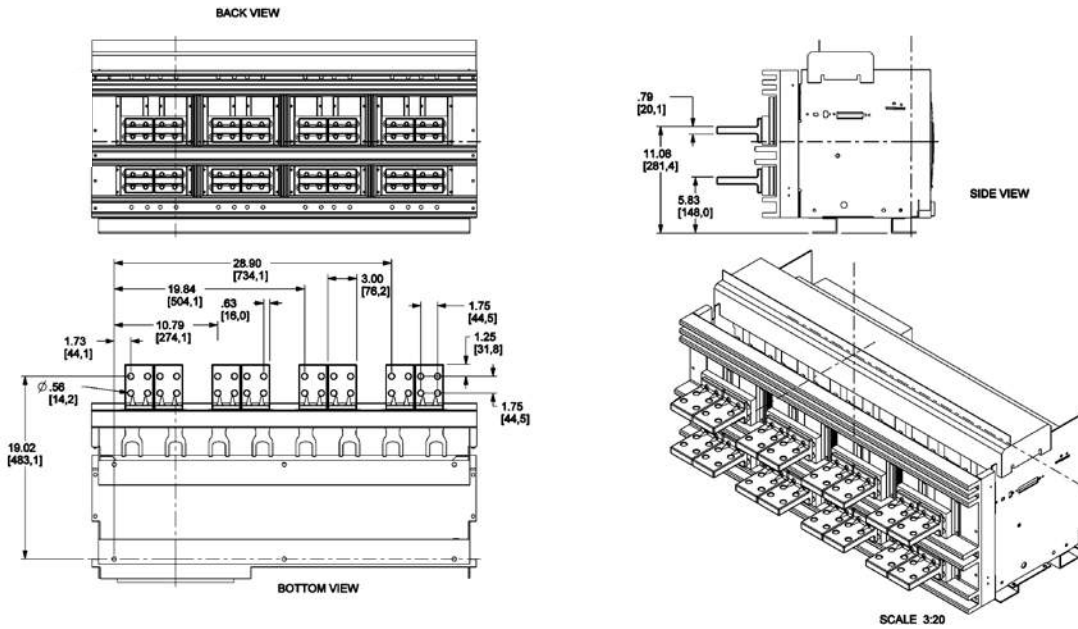
Note: dimensions in square brackets are in mm and other dimensions are in inches.



Connections

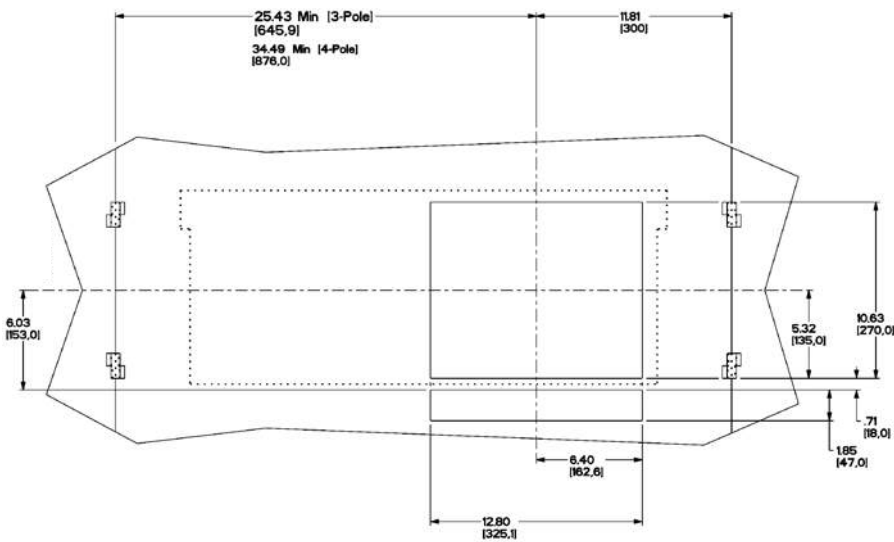
Horizontal rear connection from 4000 A to 5000 A

48096A-288-01



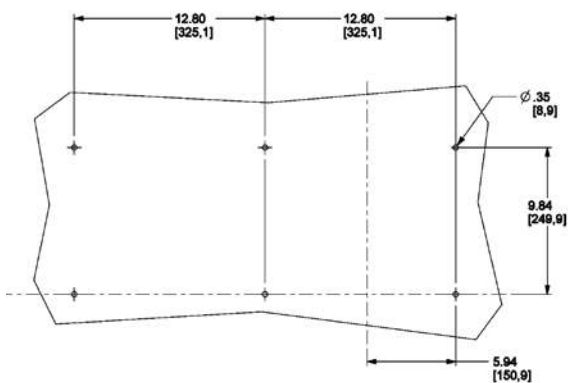
Door cutout 5000 A

48096A-225-01



Chassis mounting from 4000 A and 5000 A

DB 109034



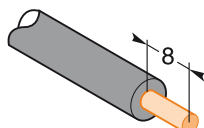
Note: dimensions in square brackets are in mm and other dimensions are in inches.



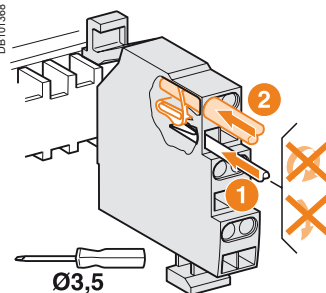
Connection of auxiliary wiring to terminal block

DB101387

-  S : 0,6 mm²
-  S : 2,5 mm²



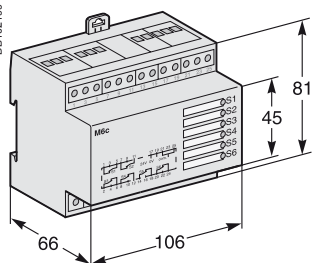
DB101388



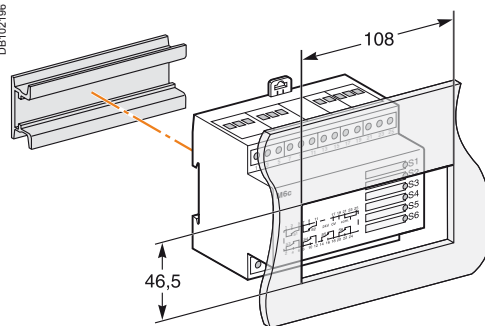
One conductor only per connection point.

Relay module

DB102199

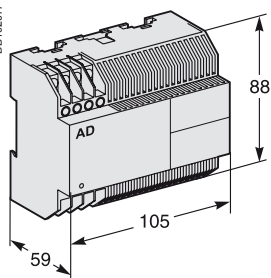


DB102198

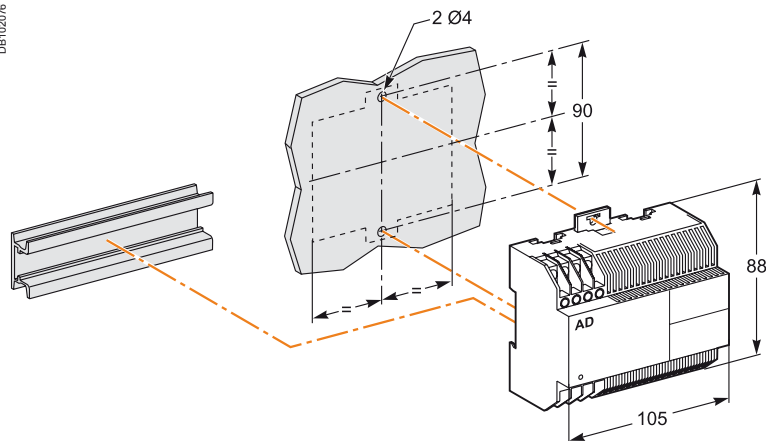


External power supply module (AD)

DB102077



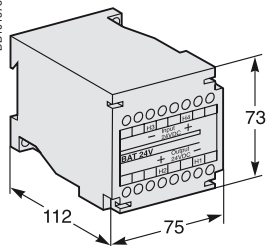
DB102076



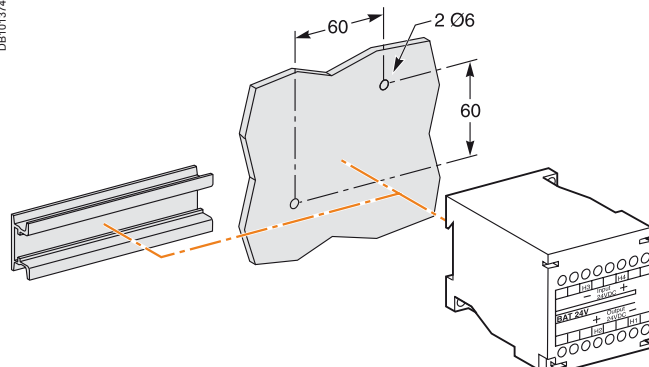
Battery module (BAT)

Mounting

DB101373



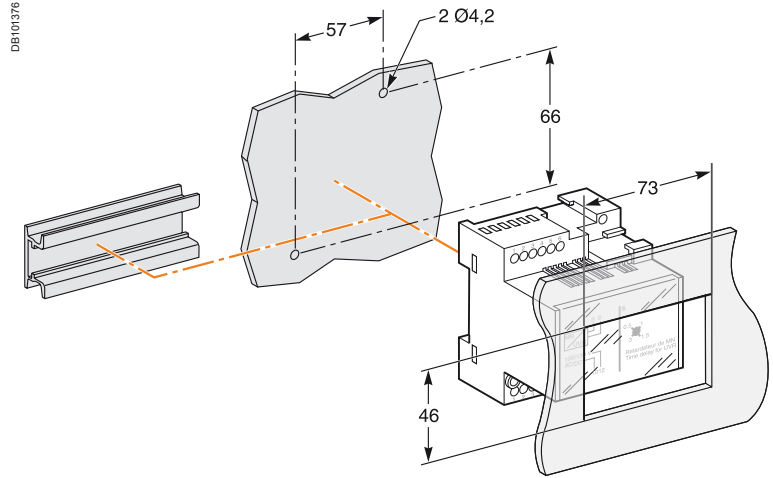
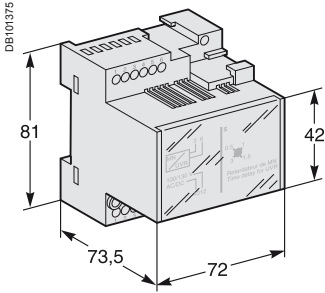
DB101374





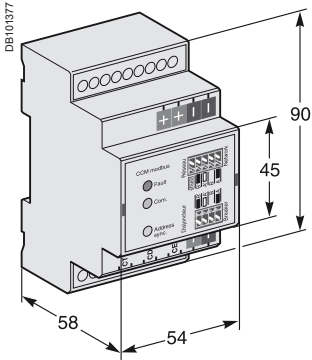
Delay unit for MN release

MNR



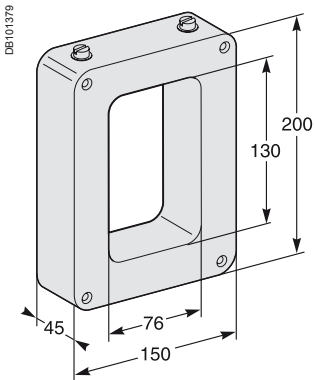
"Chassis" communication module

ModBUS

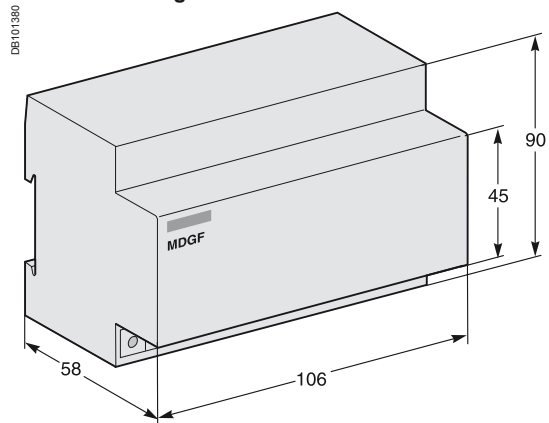


External sensor for source ground return (SGR) protection

Sensor



MDGF summing module

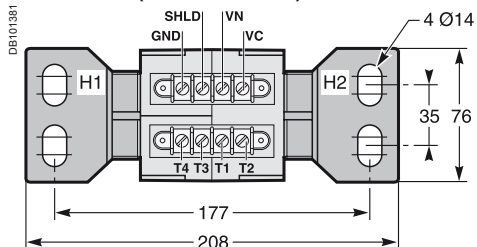




External sensor for external neutral

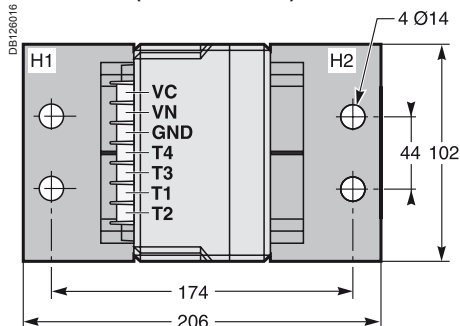
Dimensions

400/1600 A (NT08 and NT12)



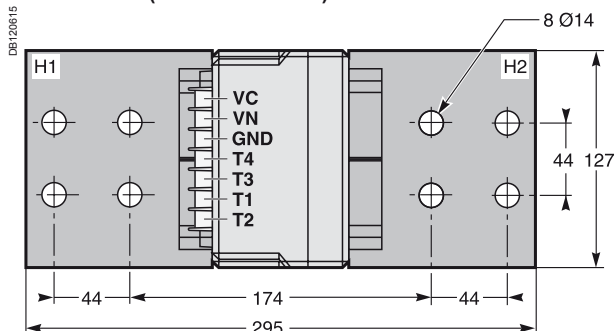
Height: 137 mm.

400/2000 A (NW08 to NW20)



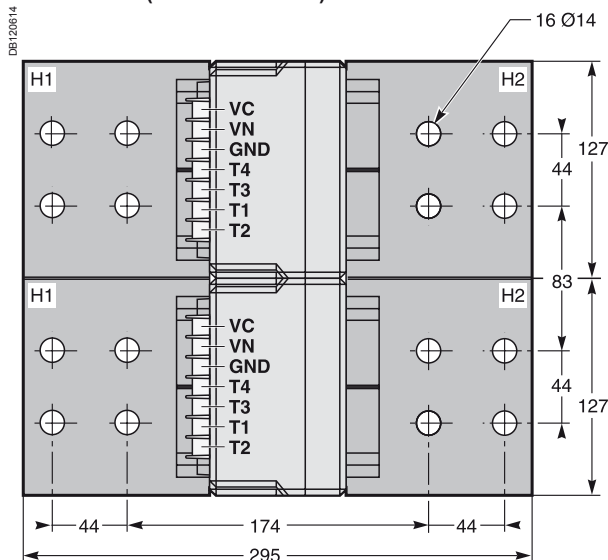
Height: 162 mm.

1000/4000 A (NW25 and NW30)



Height: 162 mm.

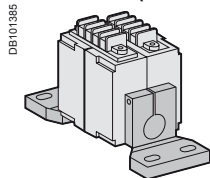
4000/5000 A (NW40 and NW50)



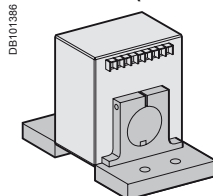
Height: 168 mm.

Installation

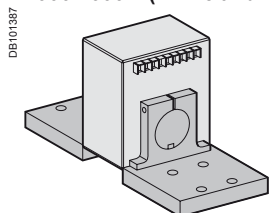
400/1600 A (NT08 and NT12)



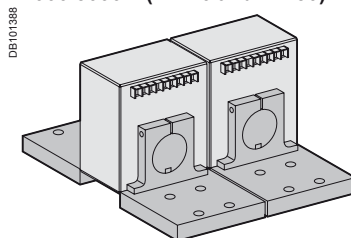
400/2000 A (NW08 to NW20)



1000/4000 A (NW25 and NW30)



4000/5000 A (NW40 and NW50)



2 current sensors supplied separately



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According to IEC 60364

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- all the components
- of an installation from a global point of view
- all the IEC standards modifications
- all the fundamental electrotechnical knowledge
- all the design stages, from medium to low voltage.





<i>Presentation</i>	1
<i>Functions and characteristics</i>	A-1
<i>Installation recommendations</i>	B-1
<i>Dimensions and connections</i>	C-1

Masterpact NT08 to NT12

Fixed and drawout devices	D-2
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Masterpact NW08 to NW50

Fixed and drawout devices	D-4
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Masterpact NT and NW

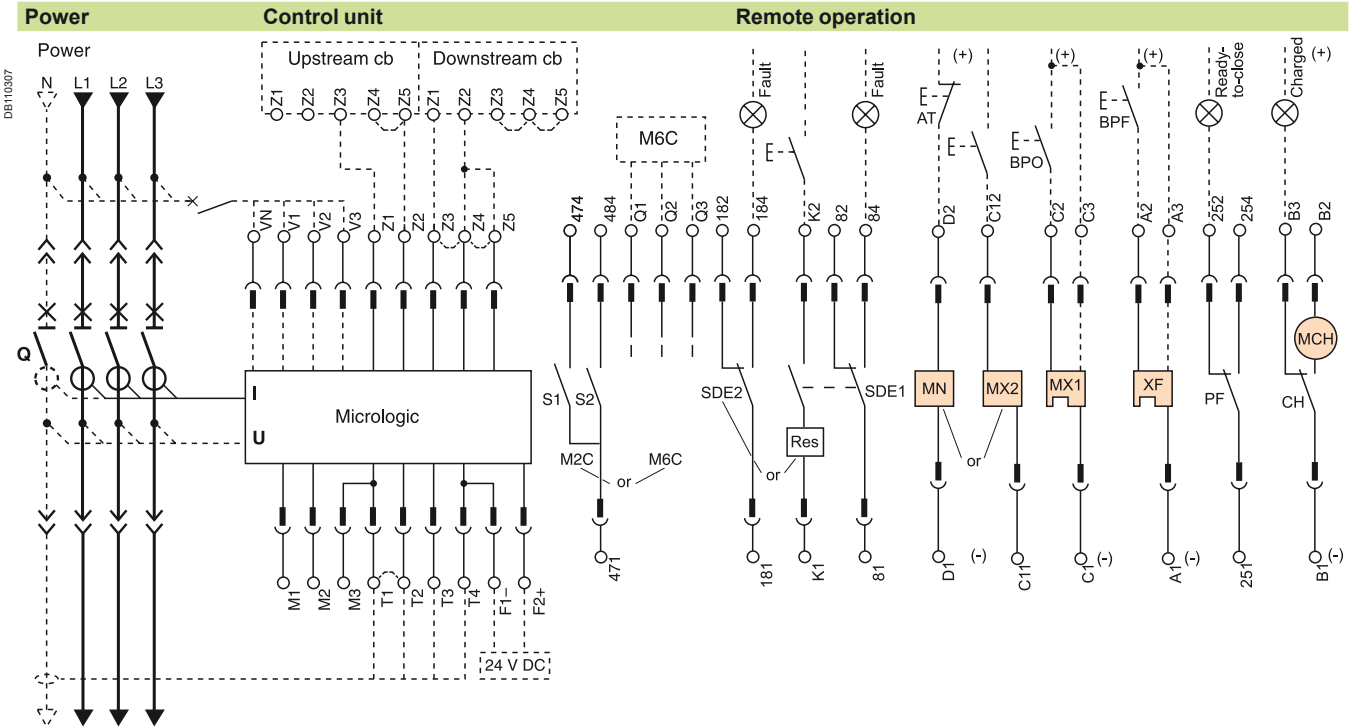
Communications option 24 V DC external power supply	D-6
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Ground-fault protection	
Neutral protection	
Zone selective interlocking	D-8

<i>Additional characteristics</i>	E-1
<i>Catalogue numbers</i>	F-1



The diagram is shown with circuits de-energised, all devices open, connected and charged and relays in normal position.



Terminal block marking	Control unit									
	Com	UC1		UC2		UC3		UC4 / M2C / M6C		
E5 E6	○	○	○	○	○	○	○	○	○	○
	Z5	M1	M2	M3	F2+	V3	484	Q3		
E3 E4	○	○	○	○	○	○	○	○	○	○
	Z3	Z4	T3	T4	VN	V2	474	Q2		
E1 E2	○	○	○	○	○	○	○	○	○	○
	Z1	Z2	T1	T2	F1-	V1	471	Q1		

Remote operation									
SDE2 / RES	SDE1	MN / MX2	MX1	XF	PF	MCH			
○	○	○	○	○	○	○			
184	K2	84	D2 / C12	C2	A2	254			
182		82	C3	A3		252			
181	K1	81	D1 / C11	C1	A1	251			
						B2			
						B3			
						B1			

A	P	H	Control unit
■	■	■	Com : E1-E6 communication
■	■	■	UC1 : Z1-Z5 zone selective interlocking Z1 = ZSI OUT SOURCE Z2 = ZSI OUT ; Z3 = ZSI IN SOURCE Z4 = ZSI IN ST (short time) Z5 = ZSI IN GF (ground-fault)
■	■	■	UC2 : T1, T2, T3, T4 = external neutral
■	■	■	UC3 : F2+, F1- external 24 DC power supply external voltage connector (must be connected to the neutral with a 3P circuit breaker)
■	■	■	UC4 : External Voltage Connector (PTE option) or M2C : 2 programmable contacts (external relay) ext. 24 V DC power supply required. or M6C : 6 programmable contacts to be connected to the external module (M6C) ext. 24 V DC power supply required.

Remote operation									
SDE2	RES	SDE1	MN	MX2	MX1	XF	PF	MCH	
○	○	○	○	○	○	○	○	○	
184	K2	84	D2	C12	C2	A2	254	B2	
182		82			C3	A3	252	B3	
181	K1	81	D1	C11	C1	A1	251	B1	

SDE2 : fault-trip indication contact
or
Res : remote reset

SDE1 : fault-trip indication contact (supplied as standard)

MN : undervoltage release
or
MX2 : shunt release

MX1 : shunt release (standard or communicating)

XF : closing release (standard or communicating)

PF : ready-to-close contact

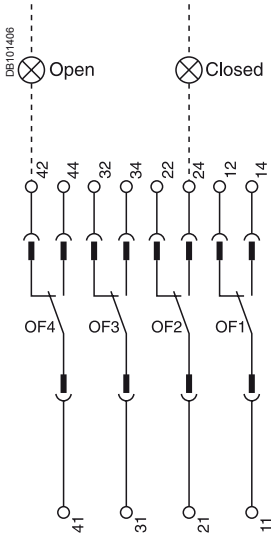
MCH : electric motor (*).

Note: when communicating MX or XF releases are used, the third wire (C3, A3) must be connected even if the communication module is not installed.

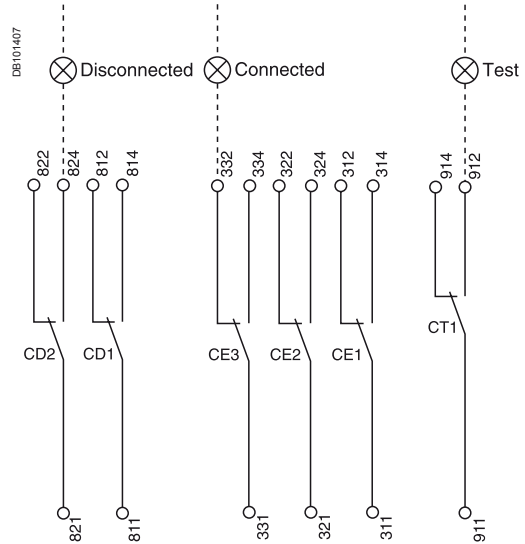
A : digital ammeter.
P : A + power meter + additional protection.
H : P + harmonics.



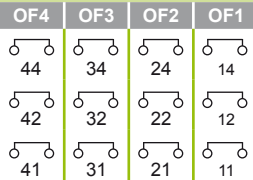
Indication contacts



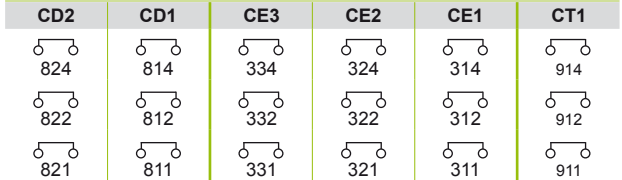
Chassis contacts



Indication contacts



Chassis contacts



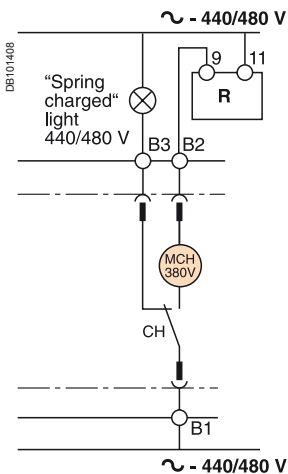
Indication contacts

OF4 / OF3 / OF2 / OF1 : ON/OFF indication contacts

(*) **Spring charging motor 440/480 V CA**
(380 V motor + additional resistor).

Chassis contacts

CD2 : disconnected position contacts
CD1 : disconnected position contacts
CE3 : connected position contacts
CE2 : connected position contacts
CE1 : connected position contacts
CT1 : test position contacts

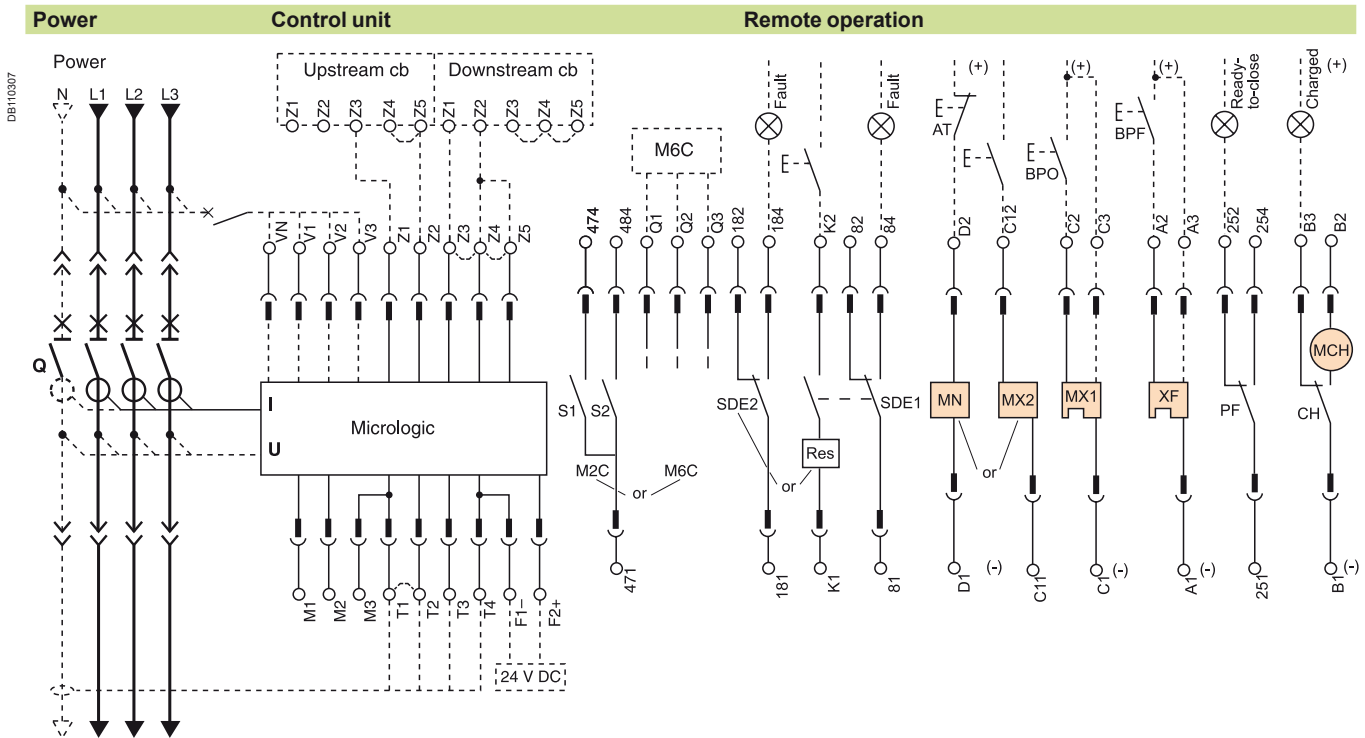


Key:

- drawout device only.
- SDE1, OF1, OF2, OF3, OF4 supplied as standard.
- interconnected connections (only one wire per connection point).



The diagram is shown with circuits de-energised, all devices open, connected and charged and relays in normal position



Terminal block marking	Control unit										
	Com	UC1	UC2	UC3	UC4	M2C / M6C					
E5 E6	○	○	○	○	○	○	○	○	○	○	○
E3 E4	○	○	○	○	○	○	○	○	○	○	○
E1 E2	○	○	○	○	○	○	○	○	○	○	○

Remote operation											
SDE2 / RES	SDE1	MN / MX2	MX1	XF	PF	MCH					
○	○	○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○	○	○	○	○
○	○	○	○	○	○	○	○	○	○	○	○

A	P	H	Control unit
■	■	■	Com : E1-E6 communication
■	■	■	UC1 : Z1-Z5 zone selective interlocking Z1 = ZSI OUT SOURCE Z2 = ZSI OUT ; Z3 = ZSI IN SOURCE Z4 = ZSI IN ST (short time) Z5 = ZSI IN GF (ground-fault)
■	■	■	UC2 : T1, T2, T3, T4 = external neutral
■	■	■	UC3 : F2+, F1- external 24 DC power supply VN external voltage connector (must be connected to the neutral with a 3P circuit breaker)
■	■	■	UC4 : External Voltage Connector (PTE option)
■	■	■	M2C : 2 programmable contacts (internal relay) ext. 24 V DC power supply required
■	■	■	or M6C : 6 programmable contacts (to be connected to the external module M6C) ext. 24 V DC power supply required

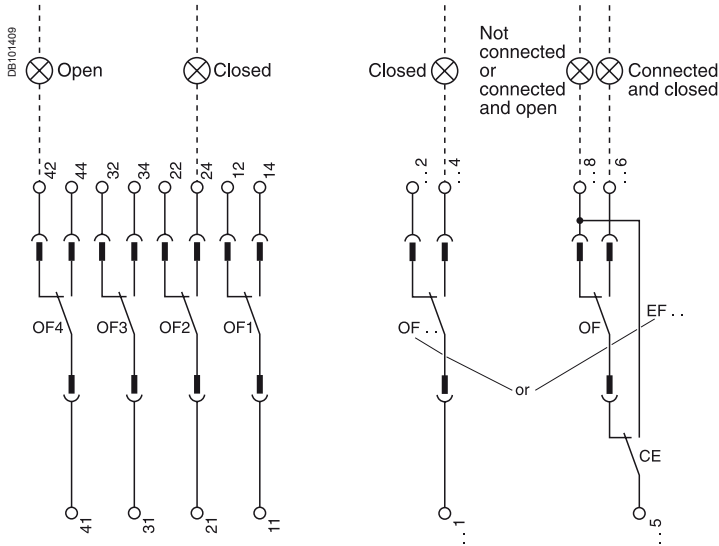
Remote operation											
SDE2 : fault-trip indication contact											
or											
Res : remote reset											
SDE1 : fault-trip indication contact (supplied as standard)											
or											
MN : undervoltage release											
or											
MX2 : shunt release											
MX1 : shunt release (standard or communicating)											
XF : closing release (standard or communicating)											
PF : ready-to-close contact											
MCH : electric motor											

Note: when communicating MX or XF releases are used, the third wire (C3, A3) must be connected even if the communication module is not installed.

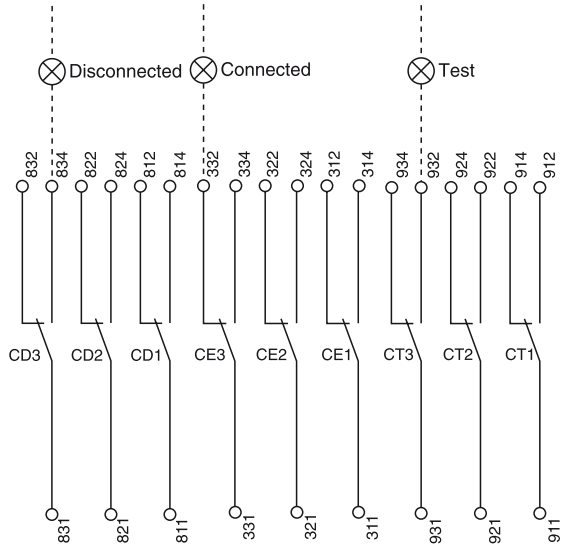
A : digital ammeter.
P : A + power meter + additional protection.
H : P + harmonics.



Indication contacts



Chassis contacts



Indication contacts

OF4	OF3	OF2	OF1	OF24	OF23	OF22	OF21	OF14	OF13	OF12	OF11
44	34	24	14	244	234	224	214	144	134	124	114
42	32	22	12	242	232	222	212	142	132	122	112
41	31	21	11	241	231	221	211	141	131	121	111
				or	or	or	or	or	or	or	or
EF24	EF23	EF22	EF21	EF14	EF13	EF12	EF11				
248	238	228	218	148	138	128	118				
246	236	226	216	146	136	126	116				
245	235	225	215	145	135	125	115				

Chassis contacts

CD3	CD2	CD1	CE3	CE2	CE1	CT3	CT2	CT1
834	824	814	334	324	314	934	924	914
832	822	812	332	322	312	932	922	912
831	821	811	331	321	311	931	921	911
						or		
CE6	CE5	CE4	CE9	CE8	CE7			
364	354	344	394	384	374			
362	352	342	392	382	372			
361	351	341	391	381	371			

Indication contacts

OF4 :	ON/OFF indication contacts	OF24 or EF24	Combined "connected-deconnected" indication contacts
OF3		OF23 or EF23	
OF2		OF22 or EF22	
OF1		OF21 or EF21	
		OF14 or EF14	
		OF13 or EF13	
		OF12 or EF12	
		OF11 or EF11	

Chassis contacts

CD3	disconnected position contacts	CE3	connected position contacts	CT3	test position contacts
CD2		CE2		CT2	
CD1		CE1		CT1	
or			or		
CE6	connected position contacts	CE9	connected position contacts	CE8	position contacts
CE5		CE7		CE7	
CE4		CD6	disconnected position contacts	CD5	position contacts
		CD4		CD4	

Key:

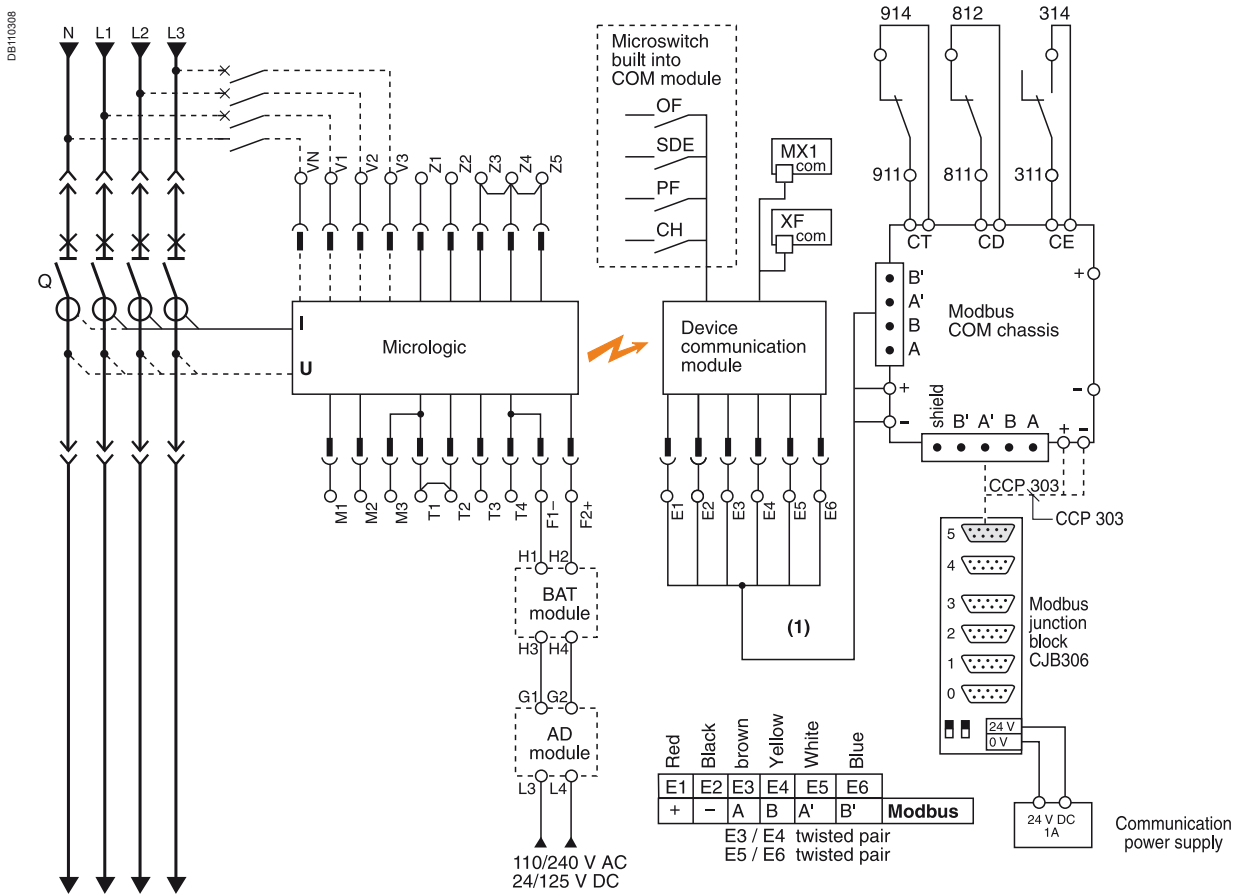
drawout device only.

SDE1, OF1, OF2, OF3, OF4 supplied as standard.

interconnected connections (only one wire per connection point).



Connection of the communications option



None of the control-unit protection functions require an auxiliary source. However, the 24 V DC external power-supply (AD module) is required for certain operating configurations as indicated in the table below:

Circuit breaker Voltage measurement inputs	Closed		Open
	Powered	Not powered	
M2C, M6C programmable contacts option	Yes	Yes	Yes
Protection function	No	No	No
Display function	No (2)	No (3)	Yes
Time-stamping function	No	No	Yes (4)
Circuit-breaker status indications and control via communications bus	No	No	No
Identification, settings, operation and maintenance aids via communications bus	No (2)	No (3)	Yes

- (1) Drawout device equipped with Modbus chassis COM.
- (2) Except for Micrologic A control units (if current < 20 % In).
- (3) Except for Micrologic A control units.
- (4) Time setting is manual and can be carried out automatically by the supervisor via the communications bus.

The communications bus requires its own 24 V DC power source (E1, E2). This source is not the same as the 24 V DC external power-supply module (F1-, F2+)

In case of using the 24 V DC external power supply (AD module), maximum cable length between 24 V DC (G1, G2) and the control unit (F1-, F2+) must not exceed 10 meters.

The BAT battery module, mounted in series upstream of the AD module, ensures an uninterrupted supply of power if the AD module power supply fails.

The voltage measurement inputs are standard equipment on the downstream connectors of the circuit breaker.

External connections are possible using the PTE external voltage measurement input option. With this option, the internal voltage measurement inputs are disconnected and terminals VN, V1, V2, V3 are connected only to the control unit (Micrologic P and H only). The PTE option is required for voltages less than 220 V and greater than 690 V (in which case a voltage transformer is compulsory). For three-pole devices, the system is supplied with terminal VN connected only to the control unit (Micrologic P and H).

When the PTE option is implemented, the voltage measurement input must be protected against short-circuits. Installed as close as possible to the busbars, this protection function is ensured by a P25M circuit breaker (1 A rating) with an auxiliary contact (cat. no. 21104 and 21117). This voltage measurement input is reserved exclusively for the control unit and must not ever be used to supply other circuits outside the switchboard.



Examples using the COM communications option

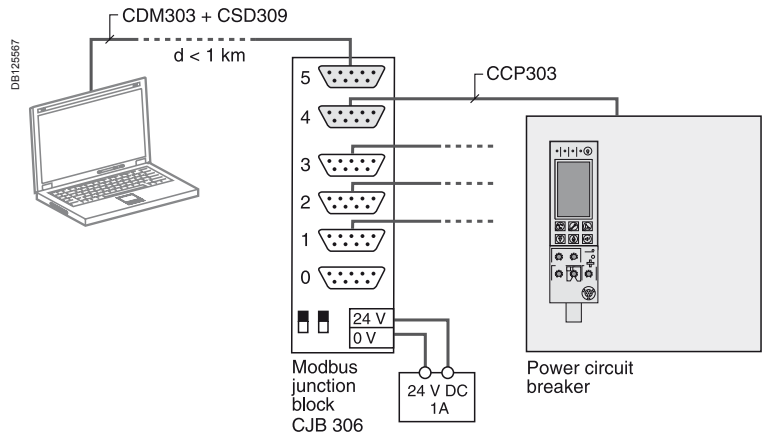
Switchboard display unit

This architecture provides remote display of the variables managed by Micrologic control units equipped with the COM Modbus module:

- I (Micrologic A)
- I, U, P, E (Micrologic P)
- I, U, P, E, THD (Micrologic H)

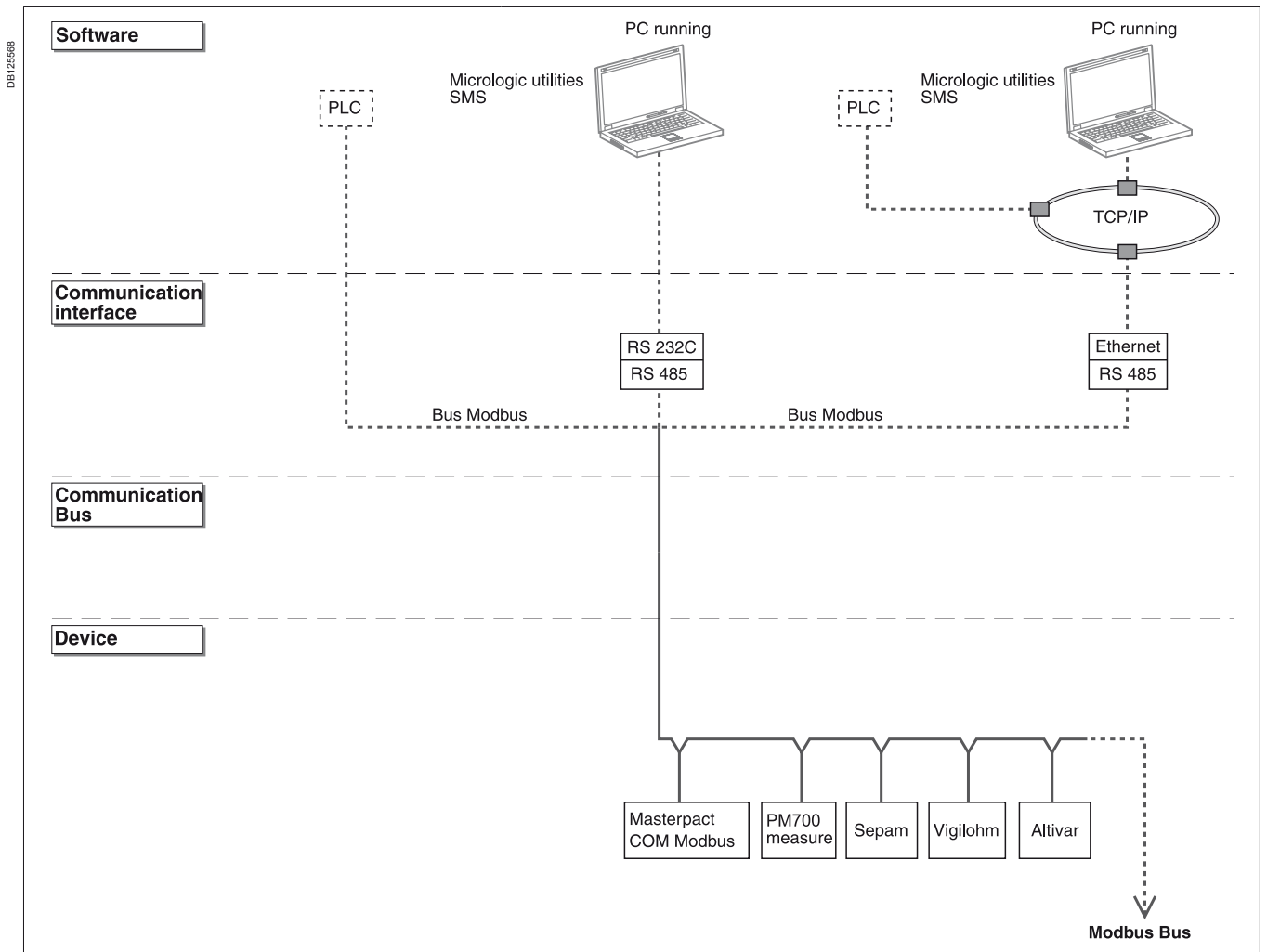
No programming is required.

For Micrologic A control unit (if current < 20 % In), it is recommended to use the 24 V DC external power supply (AD module).



Communicating switchboard

This configuration provides remote display and control of Masterpact equipped with the Modbus COM module.





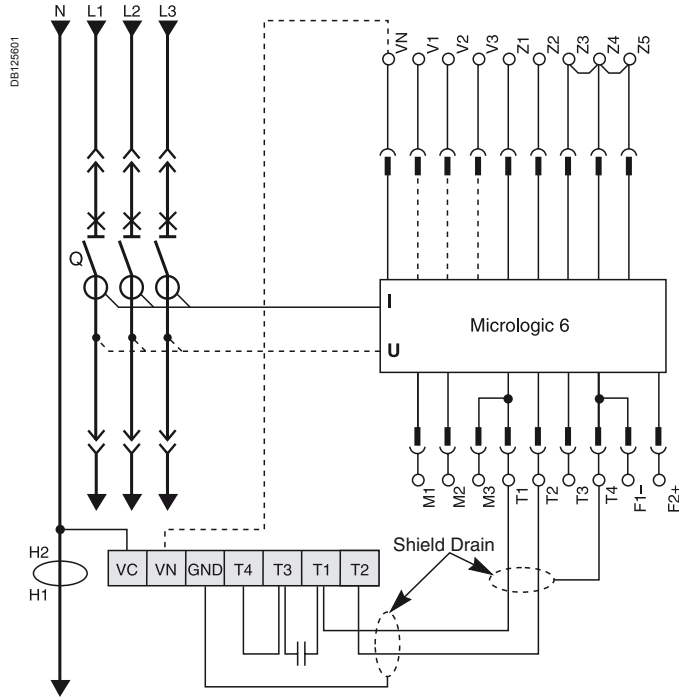
Masterpact NT and NW

Ground-fault protection
Neutral protection
Zone selective interlocking

External sensor (CT) for residual ground-fault protection

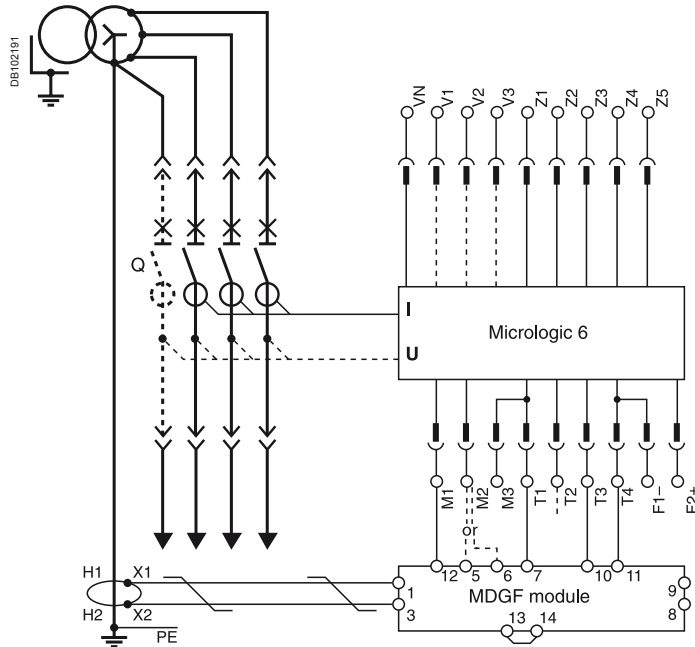
Connection of current-transformer secondary circuit for external neutral

- Masterpact equipped with a Micrologic 6 A/P/H:
- shielded cable with 2 twisted pairs
 - T1 twisted with T2
 - maximum length 10 meters
 - cable cross-sectional area 0.4 to 1.5 mm²
 - recommended cable: Belden 9552 or equivalent.
- For proper wiring of neutral CT, refer to instruction Bulletin 48041-082-01 shipped with it.
Do not remove factory-installed jumper between T1 and T2 unless neutral CT is connected.
Do not install jumper between T3 and T4.
If supply is via the top, follow the schematics.
If supply is via the bottom, control wiring is identical; for the power wiring, H1 is connected to the source side, H2 to the load side.
For four-pole versions, for residual ground-fault protection, the current transformer for the external neutral is not necessary.
Connection for signal VN is required only for power measurements (3 Ø, 4 wires, 4 CTs).



External transformer for source ground return (SGR) ground-fault protection

- ### Connection of the secondary circuit:
- Masterpact equipped with a Micrologic 6 A/P/H:
- unshielded cable with 1 twisted pair
 - maximum length 150 meters
 - cable cross-sectional area 0.4 to 1.5 mm²
 - terminals 5 and 6 may not be used at the same time
 - use terminal 5 for NW08 to 30
 - use terminal 6 for NW40 to 50
 - recommended cable: Belden 9409 or equivalent.





Neutral protection

- three pole circuit breaker:
 - Masterpact equipped with Micrologic P or H
 - the current transformer for external neutral is necessary (the wiring diagram is identical to the one used for the residual ground-fault protection)
- four pole circuit breaker:
 - Masterpact equipped with Micrologic A, P or H
 - the current transformer for external neutral is not necessary

Zone selective interlocking

Zone-selective interlocking is used to reduce the electrodynamic forces exerted on the installation by shortening the time required to clear faults, while maintaining time discrimination between the various devices.

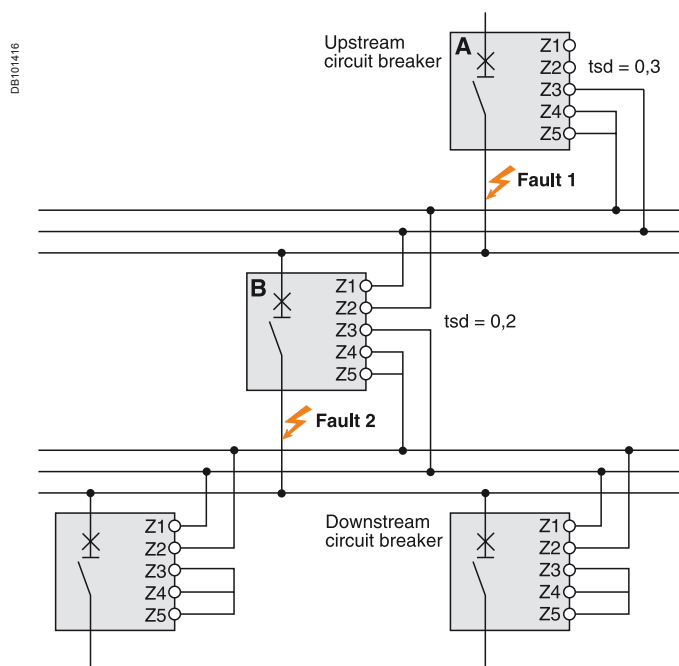
A pilot wire interconnects a number of circuit breakers equipped with Micrologic A/P/H control units, as illustrated in the diagram above.

The control unit detecting a fault sends a signal upstream and checks for a signal arriving from downstream. If there is a signal from downstream, the circuit breaker remains closed for the full duration of its tripping delay. If there is no signal from downstream, the circuit breaker opens immediately, regardless of the tripping-delay setting.

Fault 1:
Only circuit breaker A detects the fault. Because it receives no signal from downstream, it opens immediately, regardless of its tripping delay set to 0.3.

Fault 2:
Circuit breakers A and B detect the fault. Circuit breaker A receives a signal from B and remains closed for the full duration of its tripping delay set to 0.3. Circuit breaker B does not receive a signal from downstream and opens immediately, in spite of its tripping delay set to 0.2.

Note: the maximum permissible distance between two devices is 3000 m. A downstream circuit breaker can "control" up to ten upstream circuit breakers.



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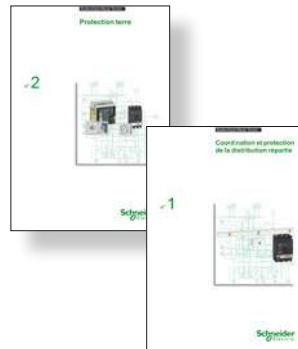
- complete library: technical documents, catalogs, FAQs, brochures...
- selection guides from the e-catalog.
- product discovery sites and their Flash animations.

You will also find illustrated overviews, news to which you can subscribe, the list of country contacts...



The technical guide

These technical guides help you comply with installation standards and rules i.e.: the electrical installation guide, the protection guide, the switchboard implementation guide, the technical booklets and the co-ordination tables all form genuine reference tools for the design of high performance electrical installations. For example, the LV protection co-ordination guide - discrimination and cascading - optimises choice of protection and connection devices while also increasing markedly continuity of supply in the installations.





<i>Presentation</i>	3
<i>Functions and characteristics</i>	A-1
<i>Installation recommendations</i>	B-1
<i>Dimensions and connections</i>	C-1
<i>Electrical diagrams</i>	D-1

Tripping curves	E-2
------------------------	-----

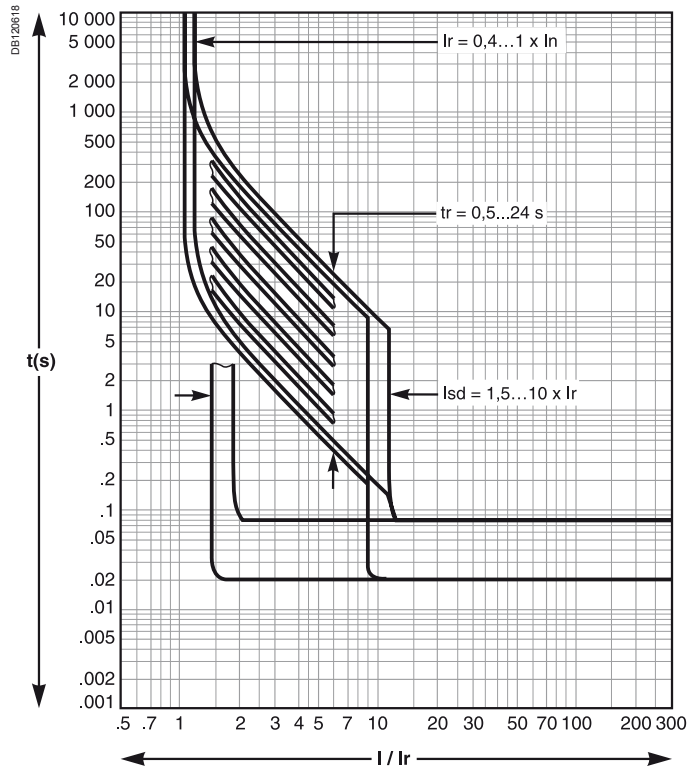
Limitation curves

Current limiting	E-4
Energy limiting	E-5
<i>Catalogue numbers</i>	F-1

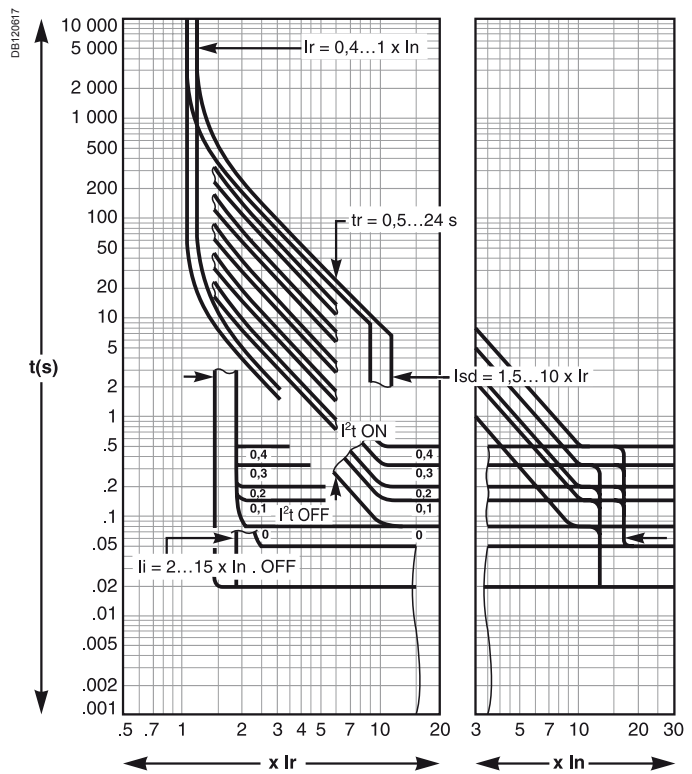


Tripping curves

Micrologic 3.0

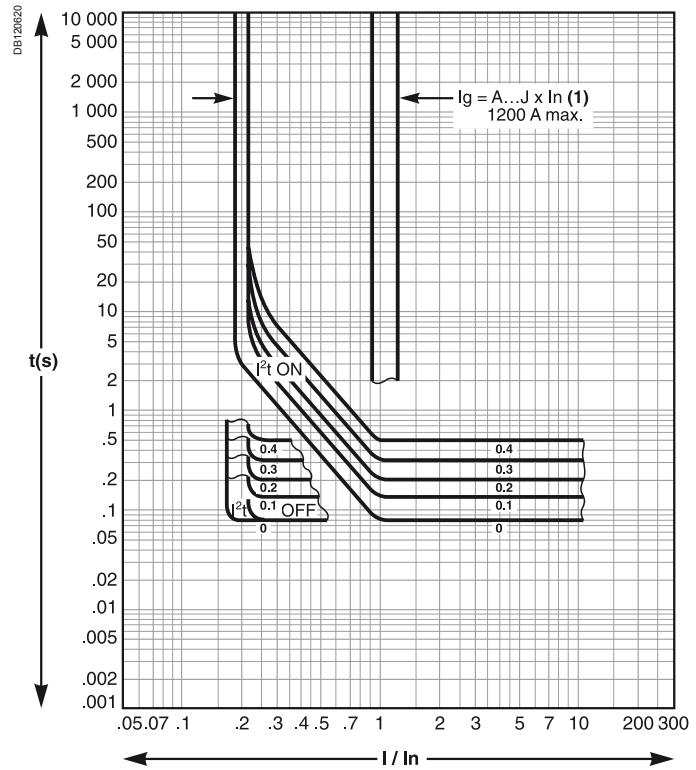


Micrologic 5.0, 6.0





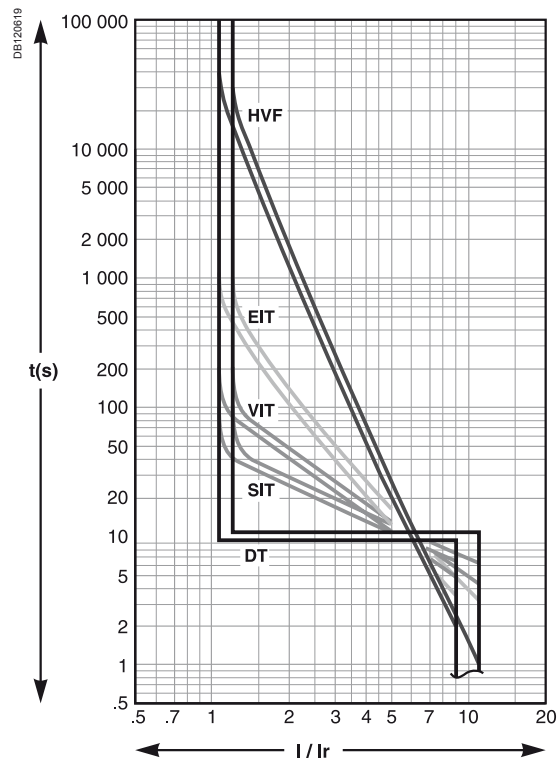
Ground fault protection (Micrologic 6.0)



(1)

$I_g = I_n \times \dots$	A	B	C	D	E	F	G	H	I
$I_g < 400 \text{ A}$	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
$400 \text{ A} \leq I_g \leq 1200 \text{ A}$	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
$I_g > 1200 \text{ A}$	500	640	720	800	880	960	1040	1120	1200

IDMTL curve (Micrologic P and H)

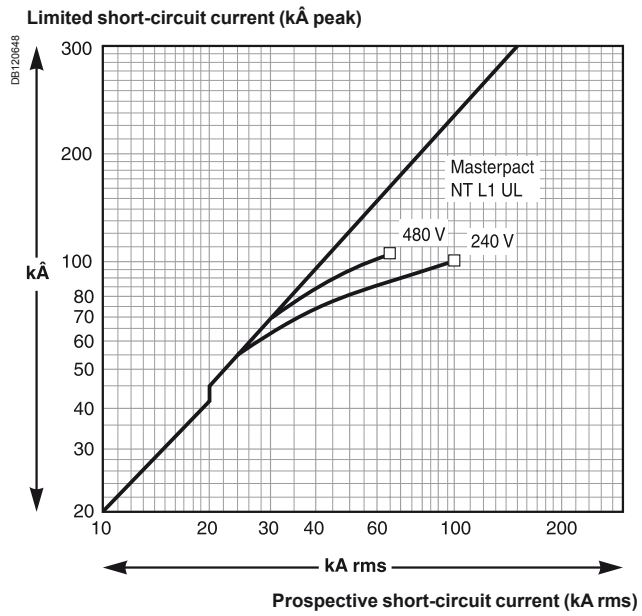




Limitation curves

Current limiting

Voltage 240/480 V AC (UL 489 Listed NT L1)

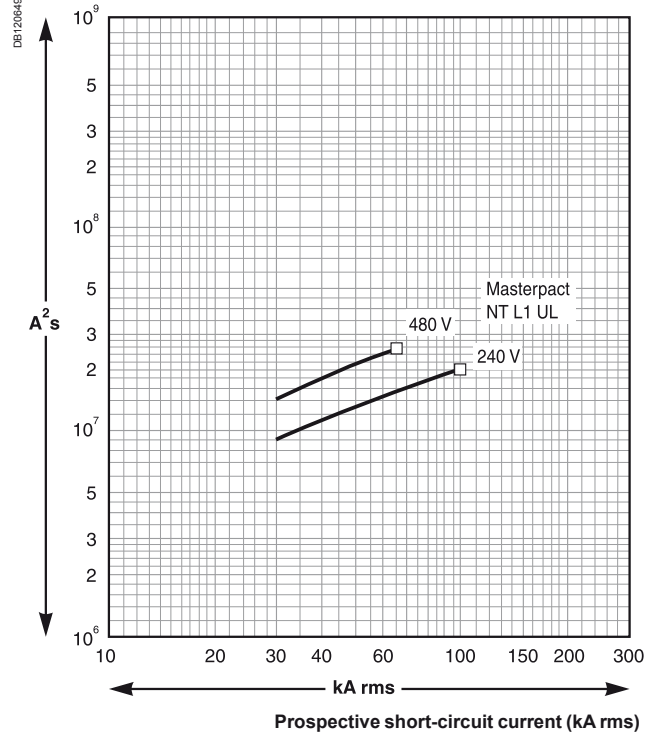




Energy limiting

Voltage 240/480 V AC (UL 489 Listed NT L1)

Limited energy



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<i>Installation recommendations</i>	B-1
<i>Dimensions and connections</i>	C-1
<i>Electrical diagrams</i>	D-1
<i>Additional characteristics</i>	E-1
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NT08 to NT12 drawout circuit breakers	
Circuit breakers	F-6
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Circuit breakers	F-24
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Switch-disconnectors	F-25
Masterpact NT or NW	
Circuit breaker and automatic switch	F-26



NT08 to NT12 fixed circuit breakers

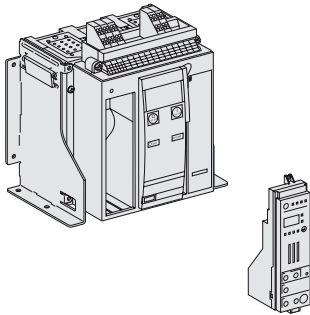
Circuit breakers

A Masterpact fixed circuit breaker is described by 4 catalogue numbers corresponding to:

- the basic circuit breaker
- a control unit
- top connection see page F-3
- a bottom connection see page F-3.

A communication option and various auxiliaries and accessories may also be added.

E46423



Basic circuit breaker

Type N			
			3P
	Frame rating	Interrupting current (KAIR RMS for U = 480 V)	
NT08	800	50	33631
NT12	1200	50	33633

Type L1			
			3P
	Frame rating	Interrupting current (KAIR RMS for U = 480 V)	
NT08	800	65	33635
NT12	1200	65	33637

Micrologic control unit

Ammeter A			3P
Micrologic 3.0 A	basic protection		64787
Micrologic 5.0 A	selective protection		64788
Micrologic 6.0 A	selective + earth-fault protection		64854

Power meter P			3P
Micrologic 5.0 P	selective protection		64789
Micrologic 6.0 P	selective + earth-fault protection		64791

Harmonic meter H			3P
Micrologic 5.0 H	selective protection		64790
Micrologic 6.0 H	selective + earth-fault protection		64792

Long time rating plug			3P
Long time rating plug standard A	$I_r = I_n \times 0.4 \text{ to } 1$		As standard
Long time rating plug low setting B	$I_r = I_n \times 0.4 \text{ to } 1$		48819
Long time rating plug high setting C	$I_r = I_n \times 0.42 \text{ to } 1$		48820
Long time rating plug D	$I_r = I_n \times 0.42 \text{ to } 1$		48836
Long time rating plug low setting E	$I_r = I_n \times 0.6 \text{ to } 1$		48837
Long time rating plug high setting F	$I_r = I_n \times 0.84 \text{ to } 1$		48838
Long time rating plug G	$I_r = I_n \times 0.66 \text{ to } 0.82$		48839
Long time rating plug low setting H	$I_r = I_n \times 0.48 \text{ to } 0.64$		48840

Communication option		3P
Modbus COM		47405

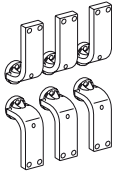
Brand option		3P
Square D Brand		47802

Portable data acquisition		3P
Masterpact GetnSet product with battery and accessories		48789



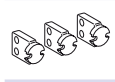
Connections

Front connection (1)

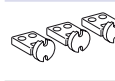
	800/1200 A	Top	3P	4P
		Bottom	34105	34106
			34107	34108

Rear connection (1)

Vertical connection

	800/1200 A	Top	3P	4P
		Bottom	34097	34098
			34099	34100

Horizontal connection

	800/1200 A	Top	3P	4P
		Bottom	34101	34102
			34103	34104

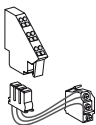
(1) Those connections are used on switch-disconnectors [see page F-12](#).

NT08 to NT12 fixed circuit breakers

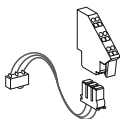
Indication contacts



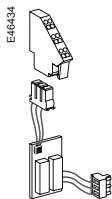
ON/OFF indication contacts (OF)		
E46463	Changeover contacts (6 A - 240 V)	4 - As standard
	1 low-level OF to replace 1 standard OF (4 max.)	47339



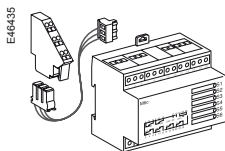
"Fault trip" indication contacts (SDE)		
E47758	Changeover contact (5 A - 240 V)	1 - As standard
	1 additional SDE (5 A - 240 V)	47340
	or 1 additional low-level SDE	47341



Programmable contacts ⁽¹⁾ (programmed via Micrologic control unit)		
E46434	2 contacts (M2C) (5 A - 240 V)	47403
	6 changeover contacts (M6C) (5 A - 240 V)	47404
	<i>(1) For Micrologic control units P and H only.</i>	



M2C.



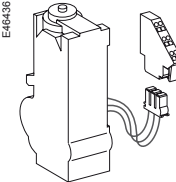
M6C.



Remote operation

Remote ON/OFF

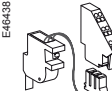
Gear motor

	AC 50/60 Hz	48/60 V	MCH
		100/130 V	47391
		200/250 V	47395
		277/415 V	47396
		440/480 V	47398
	DC	47400	
		24/30 V	47390
		48/60 V	47391
		100/130 V	47392
		200/250 V	47393

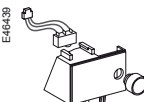
Instantaneous voltage releases

Standard		Closing release	
		XF	MX
AC 50/60 Hz	12 V DC	47349	47359
	24 V AC/DC	47350	47360
	48 V AC/DC	47351	47361
	120 V AC/DC	47352	47362
	240 V AC/DC	47353	47363
	277 V AC	47354	47364
	380/480 V AC	47355	47365
Communicants		XF com	MX com
	AC 50/60 Hz	47310	47320
	DC	47311	47321
	48 V AC/DC	47312	47322
	120 V AC/DC	47313	47323
	240 V AC/DC	47314	47324
	277 V AC	47315	47325
380/480 V AC	47316	47326	

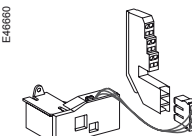
"Ready to close" contact (1 max.)

		PF
	1 changeover contact (5 A - 240 V)	47342
	1 low-level changeover contact (3 A - 240 V)	47343

Electrical closing pushbutton

		BPFE
	1 pushbutton	47512

Remote reset after fault trip

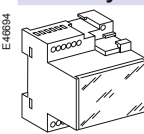
	Electrical reset	Res
	110/130 V AC	47344
	220/240 V AC	47345
	Automatic reset	RAR
	Adaptation	47346

Remote tripping

Instantaneous voltage release

		2 nd MX	or	MN
		AC 50/60 Hz	12 V DC	47369
DC	24 V AC/DC	47370		47380
	48 V AC/DC	47371		47381
	120 V AC/DC	47372		47382
	240 V AC/DC	47373		47383
	277 V AC	47374		
	380/480 V AC	47375		47385

MN delay unit

	AC 50/60 Hz	48/60 V AC/DC	R (non-adjustable)	Rr (adjustable)
	DC	100/130 V AC/DC	33684	33680
		200/250 V AC/DC	33685	33681
		380/480 V AC/DC		33682
				33683



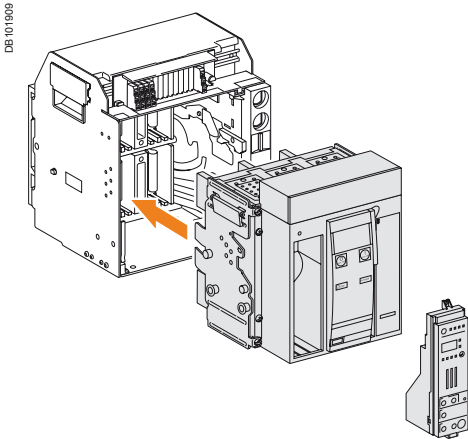
NT08 to NT12 drawout circuit breakers

Circuit breakers

A Masterpact drawout circuit breaker is described by 5 catalogue numbers corresponding to:

- the basic circuit breaker
- a control unit
- a chassis
- a top connection see page F-7
- a bottom connection see page F-7.

A communication option and various auxiliaries and accessories may also be added.



Basic circuit breaker

Type N			3P
	Frame rating	Interrupting current (KAIR RMS for U = 480 V)	
NT08	800	50	33781
NT12	1200	50	33783

Type L1			3P
	Frame rating	Interrupting current (KAIR RMS for U = 480 V)	
NT08	800	65	33947
NT12	1200	65	33949

Micrologic control unit

Ammeter A			3P
Micrologic 3.0 A	basic protection		64868
Micrologic 5.0 A	selective protection		64869
Micrologic 6.0 A	selective + earth-fault protection		64867

Power meter P			3P
Micrologic 5.0 P	selective protection		64870
Micrologic 6.0 P	selective + earth-fault protection		64872

Harmonic meter H			3P
Micrologic 5.0 H	selective protection		64871
Micrologic 6.0 H	selective + earth-fault protection		64873

Long time rating plug			3P
Long time rating plug standard A	$I_r = I_n \times 0.4 \text{ to } 1$	As standard	
Long time rating plug low setting B	$I_r = I_n \times 0.4 \text{ to } 1$		48819
Long time rating plug high setting C	$I_r = I_n \times 0.42 \text{ to } 1$		48820
Long time rating plug D	$I_r = I_n \times 0.42 \text{ to } 1$		48836
Long time rating plug low setting E	$I_r = I_n \times 0.6 \text{ to } 1$		48837
Long time rating plug high setting F	$I_r = I_n \times 0.84 \text{ to } 1$		48838
Long time rating plug G	$I_r = I_n \times 0.66 \text{ to } 0.82$		48839
Long time rating plug low setting H	$I_r = I_n \times 0.48 \text{ to } 0.64$		48840

Communication option

	Chassis	Circuit breaker
Modbus COM	33852	47485

Chassis

For type N		3P
NT08		33951
NT12		33953

For Type L1		3P
NT08		33971
NT12		33973

Brand option

Square D Brand	47802
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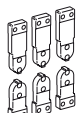
Portable data acquisition

Masterpact GetnSet product with battery and accessories	48789
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Connections and chassis locking

Chassis front connection

E46440 	800/1200 A	Top	3P 34119	4P 34120
		Bottom	34121	34122

Chassis rear connection




Vertical connection

E46429 	800/1200 A	Top	3P 34111	4P 34112
		Bottom	34113	34114

Horizontal connection


E46430 	800/1200 A	Top	3P 34115	4P 34116
		Bottom	34117	34118

Rear connection accessories

E46700 	Arc chute cover	3P/4P	As standard	
E46698 	Auxiliary terminal shield (CB)	3P	33763	
		4P	33764	
E46899 	Safety shutters	Safety shutters (VO)	3P	As standard
			4P	As standard

Chassis locking

Disconnected position locking

E46895 	By padlocks	VCPO	As standard			
		By Profalux keylocks	Profalux	1 lock with 1 key + adaptation kit	33773	
				2 locks 1 key + adaptation kit	33774	
				2 locks 2 different keys + adaptation kit	33775	
		1 keylock Profalux (without adaptation kit):		identical key not identified combination	33173	
				identical key identified 215470 combination	33174	
				identical key identified 215471 combination	33175	
		Par serrures Ronis	Ronis	1 lock with 1 key + adaptation kit	33776	
					2 locks 1 key + adaptation kit	33777
					2 locks 2 different keys + adaptation kit	33778
			1 keylock Ronis (without adaptation kit):		identical key not identified combination	33189
					identical key identified EL24135 combination	33190
					identical key identified EL24153 combination	33191
			identical key identified EL24315 combination	33192		
		Optional disconnected/test/connected position locking			33779	
Adaptation kit (without keylock):		adaptation kit Profalux	33769			
		adaptation kit Ronis	33770			
		adaptation kit Castell	33771			
		adaptation kit Kirk	33772			

Door interlock (1 part)

E46464 	Right-hand side of chassis (VPECD)	33786
	Left-hand side of chassis (VPECG)	33787

Open door racking interlock (VPOC)

E46465 	Racking interlock (VPOC)	33788
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Breaker mismatch protection / cradle rejection kits

E47765 	Breaker mismatch protection (VDC)	As standard
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Racking interlock between racking crank and off position (IBPO)

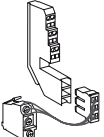
	Racking interlock (IBPO)	As standard
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Automatic spring discharge (DAE)

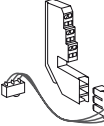
E46898 	Spring discharge (DAE)	As standard
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ON/OFF indication contacts (OF)

E44467 	Changeover contacts (6 A - 240 V)	4 - As standard
	1 low-level OF to replace 1 standard OF (4 max.)	33806

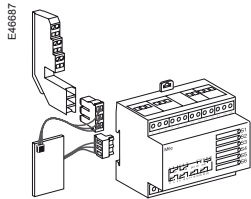
"Fault trip" indication contacts (SDE)

E44759 	Changeover contact (5 A - 240 V)	1 - As standard
	1 additional SDE (5 A - 240 V) or 1 additional low-level SDE	47430 47431

Programmable contacts ⁽¹⁾ (programmed via Micrologic control unit)


E46686 	2 contacts M2C (5 A - 240 V)	47483
	6 changeover contacts M6C (5 A - 240 V) <i>(1) For Micrologic control units P and H only.</i>	47484

M2C.



M6C.

Carriage switches (connected / disconnected / test position)

E46861 	Changeover contacts (6 A - 240 V)	
	1 connected position contact (3 max.)	33751
	1 test position contact (1 max.)	33752
	1 disconnected position contact (2 max.)	33753
	And/or low-level changeover contacts	
	1 connected position contact (3 max.)	33754
1 test position contact (1 max.)	33755	
1 disconnected position contact (2 max.)	33756	

Auxiliary terminals for chassis alone

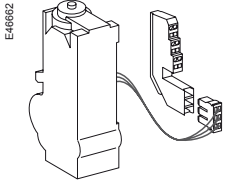
3 wire terminal (30 parts)	47071
6 wire terminal (10 parts)	47072
Jumpers (10 parts)	47900



Remote operation

Remote ON/OFF

Gear motor

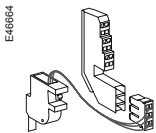


E46862	AC 50/60 Hz	48 V	MCH	47461
		100/130 V		47465
		200/250 V		47466
		277/415 V		47468
		440/480 V		47470
	DC	24/30 V		47460
		48/60 V		47461
		100/125 V		47462
		200/250 V		47463

Instantaneous voltage release

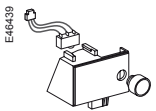
		Closing release	Opening release
Standard		XF	MX
AC 50/60 Hz	DC	12 V DC	33809
		24 V AC/DC	33810
		48 V AC/DC	33811
		120 V AC/DC	33812
		240 V AC/DC	33813
		277 V AC	33814
		380/480 V AC	33815
Communicating		XF com	MX com
AC 50/60 Hz	DC	12 V DC	33791
		24 V AC/DC	33792
		48 V AC/DC	33793
		120 V AC/DC	33794
		240 V AC/DC	33795
		277 V AC	33796
		380/480 V AC	33797

Ready to close contact (1 max.)



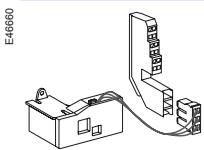
E46684			PF
	1 changeover contact (5 A - 240 V)		47432
	1 low-level changeover contact (3 A - 240 V)		47433

Electrical closing pushbutton



E46439	1 pushbutton	BPFE
		47512

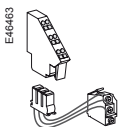
Remote reset after fault trip



E46880	Electrical reset	Res
	110/130 V AC	47434
	220/240 V AC	47435
	Automatic reset	RAR
	Adaptation	47346

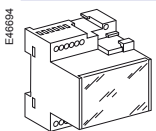
Remote tripping

Instantaneous voltage release



E46463	AC 50/60 Hz	DC	12 V DC	2 ^{eme} MX	ou	MN
				47449		
				47450		33819
				47451		33820
				47452		33821
				47453		33822
				47454		
				47455		
						33824

MN delay unit



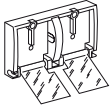
E46894	AC 50/60 Hz	DC	48/60 V AC/DC	R (non-adjustable)	Rr (adjustable)
					33680
				33684	33681
				33685	33682
					33683



Circuit breaker locking

Pushbutton locking device

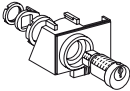
E46866



By padlocks	33897
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OFF position locking

E46701



By padlocks + BPFE support		
	VCPO	47514
By Profalux keylocks		
Profalux	1 lock with 1 key + adaptation kit	47519
	2 locks 1 key + adaptation kit	47520
1 keylock Profalux (without adaptation kit):	identical key not identified combination	33173
	identical key identified 215470 combination	33174
	identical key identified 215471 combination	33175
By Ronis keylocks + BPFE support		
Ronis	1 lock with 1 key + adaptation kit	47521
	2 locks 1 key + adaptation kit	47522
1 keylock Ronis (without adaptation kit):	identical key not identified combination	33189
	identical key identified EL24135 combination	33190
	identical key identified EL24153 combination	33191
	identical key identified EL24315 combination	33192
Adaptation kit (without keylock):	adaptation kit Profalux	47515
	adaptation kit Ronis	47516
	adaptation kit Kirk	47517
	adaptation kit Castell	47518

Other circuit breaker accessories

Mechanical operation counter (CDM)

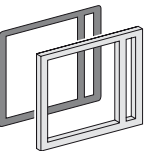
E46867



Operation counter CDM	33895
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Escutcheon and accessories

E46868



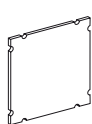
Escutcheon

E46869



Cover

E46870



Blanking plate

	Fixed	Drawout
Escutcheon	33718	33857
Transparent cover (IP54)		33859
Escutcheon blanking plate		33858



Accessories for Micrologic control units

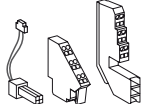
Source ground return (SGR) earth fault protection

E46672		External sensor (SGR)	33579
		MDGF summing module	48891

External sensor for neutral + earth-fault protection (TCE)

E46671		CT rating : 400/1600 A	33576
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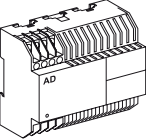
Voltage measurement input (for breakers supplied via bottom terminals) (PTE)

E46673		Voltage measurement input.	Fixed	47506
		Can be only used for Micrologic control unit H and P.	Drawout	47507

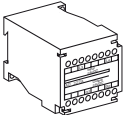
Zone Selective Interlocking option for Micrologic P and H

ZSI	As standard
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External power supply module

DB105380		24/30 V DC	54440
		48/60 V DC	54441
		100/125 V DC	54442
		110/130 V AC	54443
		200/240 V AC	54444
		380/415 V AC	54445

Battery module

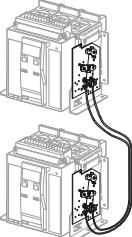
E47787		1 battery 24 V	54446
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Mechanical interlocking for source changeover

Interlocking using connecting rods

Complete assembly with 2 adaptation fixtures + rods	
2 Masterpact NT fixed devices	33912
2 Masterpact NT drawout devices	33913


Interlocking using cables ⁽¹⁾

DB108564		Choose 2 adaptation fixtures (1 for each breaker) + 1 set of cables	
		1 adaptation fixture for Masterpact NT fixed devices	33200
		1 adaptation fixture for Masterpact NT drawout devices	33201
		1 set of cables	33209

⁽¹⁾ Can be used with any combination of NT or NW, fixed or drawout devices.

Circuit breaker locking

Cable-type door interlock


E70742		1 complete assembly for Masterpact NT fixed devices	33920
		1 complete assembly for Masterpact NT drawout devices	33921

Test equipment

Mini test kit

E56821		Hand held test kit (HHTK)	33594
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Portable test kit

E5954		Full function test kit (FFTK)	33595
		Test report edition come from FFTK	34559
		FFTK test cable 2 pin for STR trip unit	34560
		FFTK test cable 7 pin for Micrologic trip unit	33590

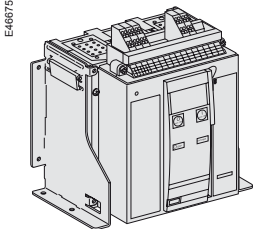


NT08 to NT12 switch-disconnectors

Switch-disconnectors

A Masterpact fixed switch-disconnectors is described by 3 catalogue numbers corresponding to :

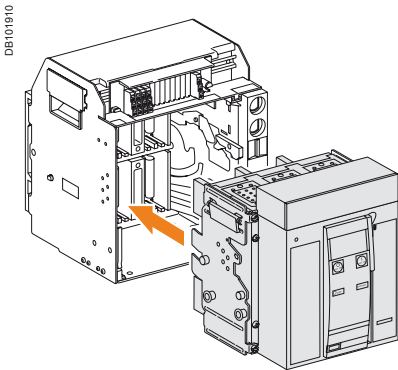
- the basic circuit breaker
- a top connection see page F-3
- a bottom connection see page F-3.



E46875

A Masterpact drawout switch-disconnectors is described by 4 catalogue numbers corresponding to :

- the basic circuit breaker
- a chassis
- a top connection see page F-7
- a bottom connection see page F-7.



DB101910

Basic fixed switch-disconnector

Type HF			3P	4P
	Frame rating	Interrupting current (KAIR RMS for U = 480 V)		
NT08	800	50	34039	34040
NT12	1200	50	34041	34042

Communication option	
COM Modbus	47405

Micrologic control unit	
Micrologic ELS DINF	As standard

Basic drawout switch-disconnector

Type HF			3P	4P
	Frame rating	Interrupting current (KAIR RMS for U = 480 V)		
NT08	800	50	34043	34044
NT12	1200	50	34045	34046

Chassis	
For type HF	
NT08	33951
NT12	33953

Communication option		
	Chassis	Switch-disconnector
COM Modbus	33852	47485

Micrologic control unit	
Micrologic ELS DINF	As standard



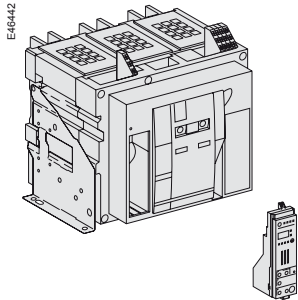
NW08 to NW50 fixed circuit breakers

Circuit breakers

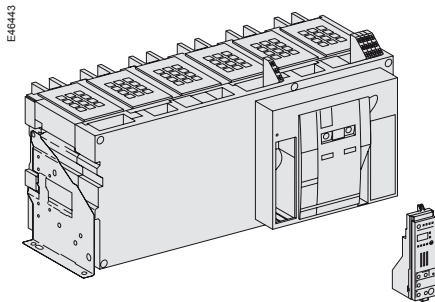
A Masterpact fixed circuit breaker is described by 4 catalogue numbers corresponding to:

- the basic circuit breaker
- a control unit
- a top connection see page F-14
- a bottom connection see page F-14.

A communication option and various auxiliaries and accessories may also be added.



Basic circuit breaker ≤ 3000 A.



Basic circuit breaker > 3000 A.

Basic circuit breaker

Type N

			3P	4P
	Frame rating	Interrupting current (KAIR RMS for U = 480 V)		
NW08	800	65	64637	64638
NW12	1200	65	64641	64642
NW16	1600	65	64643	64644
NW20	2000	65	64645	64646

Type H

			3P	4P
	Frame rating	Interrupting current (KAIR RMS for U = 480 V)		
NW08	800	100	64659	64660
NW12	1200	100	64663	64664
NW16	1600	100	64665	64666
NW20	2000	100	64667	64668
NW25	2500	100	64669	64670
NW30	3000	100	64671	64672
NW40	4000	100	64673	64674
NW50	5000	100	64675	64676

Micrologic control unit

Ammeter A

		3P/4P
Micrologic 3.0 A	basic protection	64787
Micrologic 5.0 A	selective protection	64788
Micrologic 6.0 A	selective + earth-fault protection	64854

Power meter P

		3P/4P
Micrologic 5.0 P	selective protection	64789
Micrologic 6.0 P	selective + earth-fault protection	64791

Harmonic meter H

		3P/4P
Micrologic 5.0 H	selective protection	64790
Micrologic 6.0 H	selective + earth-fault protection	64792

Long time rating plug

		3P/4P
Long time rating plug standard A	$I_r = I_n \times 0.4$ to 1	As standard
Long time rating plug low setting B	$I_r = I_n \times 0.4$ to 1	48819
Long time rating plug high setting C	$I_r = I_n \times 0.42$ to 1	48820
Long time rating plug D	$I_r = I_n \times 0.42$ to 1	48836
Long time rating plug low setting E	$I_r = I_n \times 0.6$ to 1	48837
Long time rating plug high setting F	$I_r = I_n \times 0.84$ to 1	48838
Long time rating plug high setting F	$I_r = I_n \times 0.66$ to 0.82	48839
Long time rating plug low setting H	$I_r = I_n \times 0.48$ to 0.64	48840

Communication option

Modbus COM	48188
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Brand option

Square D Brand	47802
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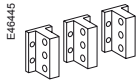
Portable data acquisition

Masterpact GetnSet product with battery and accessories	48789
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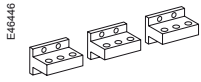
Rear connection

Vertical connection



			3P	4P
E46445	800-1200 A	Top	64803	64804
		Bottom	64805	64806
	2500/3200 A	Top	64807	64808
		Bottom	64809	64810
	4000/5000 A	Top	64811	64812
		Bottom	64813	64814

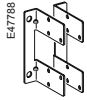
Horizontal connection



			3P	4P
E46446	800-1200 A	Top	64815	64816
		Bottom	64817	64818
	2500/3200 A	Top	64819	64820
		Bottom	64821	64822
	4000/5000 A	Top	64823	64824
		Bottom	64825	64826

Rear connection accessories

Brackets for mounting on a backplate

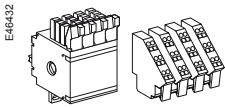


E47788	2 parts	47829
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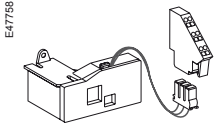
Indication contacts

ON/OFF indication contacts (OF)



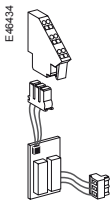
Block of 4 changeover contacts (6 A - 240 V)	1 block - As standard
1 additional block of 4 contacts (2 max.)	48198

Fault trip indication contacts (SDE)



Changeover contact (5 A - 240 V)	1 block - As standard
1 additional SDE (5 A - 240 V)	48200
or 1 additional low-level SDE	48201

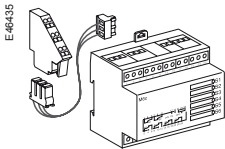
Programmable contacts ⁽¹⁾ (programmed via Micrologic control unit)



2 contacts M2C (5 A - 240 V)	47403
6 changeover contacts M6C (5 A - 240 V)	47404

⁽¹⁾ For Micrologic control units P and H only.

M2C.



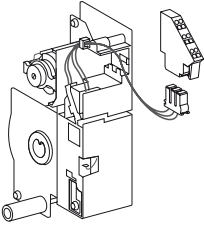
M6C.



Remote ON/OFF

Gear motor

E4647



			MCH
AC 50/60 Hz	48/60 V		48207
	100/130 V		48211
	200/250 V		48212
	240/277 V		48213
	380/415 V		48214
	440/480 V		48215
DC	24/30 V		48206
	48/60 V		48207
	100/125 V		48208
	200/250 V		48209

Instantaneous voltage releases

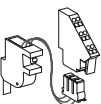
E46437



		Closing release	Opening release
Standard			
AC 50/60 Hz	12 V DC	XF	MX
	24 V AC/DC	47349	47359
	48 V AC/DC	47350	47360
	120 V AC/DC	47351	47361
	240 V AC/DC	47352	47362
	277 V AC	47353	47363
	380/480 V AC	47354	47364
DC	12 V DC	47355	47365
	24 V AC/DC	XF com	MX com
	48 V AC/DC	47310	47320
	120 V AC/DC	47311	47321
	240 V AC/DC	47312	47322
	277 V AC	47313	47323
	380/480 V AC	47314	47324
AC 50/60 Hz	12 V DC	47315	47325
	24 V AC/DC	47316	47326
	48 V AC/DC		
	120 V AC/DC		
DC	240 V AC/DC		
	277 V AC		
	380/480 V AC		

Ready to close contact (1 max.)

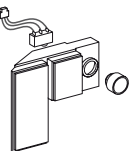
E46438



		PF
1 changeover contact (5 A - 240 V)		47342
	1 low-level changeover contact	47343

Electrical closing pushbutton

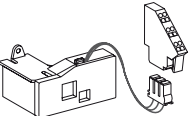
E46877



		BPFE
1 pushbutton		48534

Remote reset after fault trip

E46865



		Res
Electrical reset	110/130 V AC	48202
	220/240 V AC	48203
Automatic reset		RAR
Adaptation		47346

Remote tripping

Instantaneous voltage release

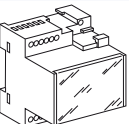
E46437



			2 nd MX	or	MN
AC 50/60 Hz	12 V DC		47369		
	24 V AC/DC		47370		47380
DC	48 V AC/DC		47371		47381
	120 V AC/DC		47372		47382
	240 V AC/DC		47373		47383
	277 V AC		47374		
	380/480 V AC		47375		47385

MN delay unit

E46894



			R (non-adjustable)	Rr (adjustable)
AC 50/60 Hz	48/60 V AC/DC			33680
	100/130 V AC/DC		33684	33681
DC	200/250 V AC/DC		33685	33682
	380/480 V AC/DC			33683



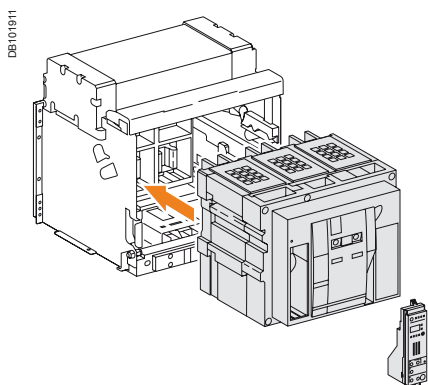
NW08 to NW50 drawout circuit breakers

Circuit breakers

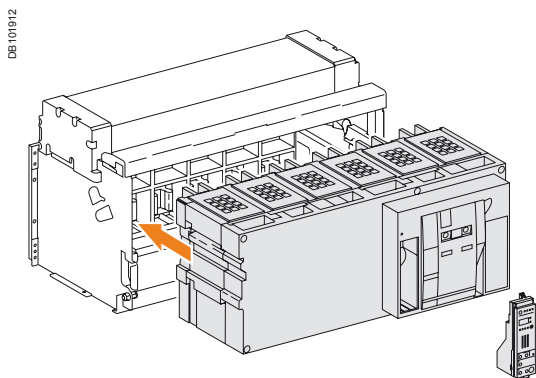
A Masterpact drawout circuit breaker is described by 5 catalogue numbers corresponding to:

- the basic circuit breaker
- a control unit
- a chassis
- a top connection see page F-18
- a bottom connection see page F-18.

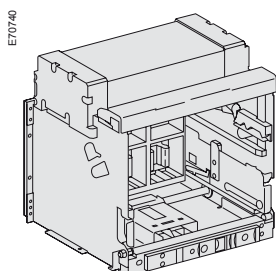
A communication option and various auxiliaries and accessories may also be added.



Basic circuit breaker + chassis ≤ 3000 A.



Basic circuit breaker + chassis > 3000 A.



Chassis ≤ 3000 A.

Basic circuit breaker

Type N			3P	4P
	Frame rating	Interrupting current (KAIR RMS for U = 480 V)		
NW08	800	65	64647	64648
NW12	1200	65	64651	64652
NW16	1600	65	64653	64654
NW20	2000	65	64655	64656

Type H			3P	4P
	Frame rating	Interrupting current (KAIR RMS for U = 480 V)		
NW08	800	100	64677	64678
NW12	1200	100	64681	64682
NW16	1600	100	64683	64684
NW20	2000	100	64685	64686
NW25	2500	100	64687	64688
NW30	3000	100	64689	64690
NW40	4000	100	64691	64692
NW50	5000	100	64693	64694

Micrologic control unit

Ammeter A		3P/4P
Micrologic 3.0 A	basic protection	64857
Micrologic 5.0 A	selective protection	64858
Micrologic 6.0 A	selective + earth-fault protection	64863

Power meter P		3P/4P
Micrologic 5.0 P	selective protection	64859
Micrologic 6.0 P	selective + earth-fault protection	64861

Power meter P		3P/4P
Micrologic 5.0 H	selective protection	64860
Micrologic 6.0 H	selective + earth-fault protection	64862

Long time rating plug		3P/4P
Long time rating plug standard A	$I_r = I_n \times 0.4$ to 1	As standard
Long time rating plug low setting B	$I_r = I_n \times 0.4$ to 1	48819
Long time rating plug high setting Chigh setting C	$I_r = I_n \times 0.42$ to 1	48820
Long time rating plug D	$I_r = I_n \times 0.42$ to 1	48836
Long time rating plug low setting E	$I_r = I_n \times 0.6$ to 1	48837
Long time rating plug high setting F	$I_r = I_n \times 0.84$ to 1	48838
Long time rating plug G	$I_r = I_n \times 0.66$ to 0.82	48839
Long time rating plug low setting H	$I_r = I_n \times 0.48$ to 0.64	48840

Communication option

	Chassis	+	Circuit breaker
Modbus COM	33852		48384

Chassis

Type N		
	3P	4P
NW08	64715	64716
NW12	64719	64720
NW16	64721	64722
NW20	64723	64724

Type H		
	3P	4P
NW08	64727	64728
NW12	64731	64732
NW16	64733	64734
NW20	64735	64736
NW25	64737	64738
NW30	64739	64740
NW40	64741	64742
NW50	64743	64744

Brand option

Square D Brand	47802
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Portable data acquisition

Masterpact GetnSet product with battery and accessories	48789
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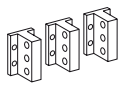


NW08 to NW50 drawout circuit breakers

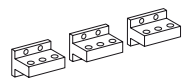
Connections and chassis accessories

Chassis rear connection

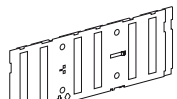
Vertical connection

	800-1200 A	Top	3P	64829	4P	64830
		Bottom		64831	64832	
	2500/3200 A	Top		64833	64834	
		Bottom		64835	64836	
	4000/5000 A	Top		64837	64838	
		Bottom		64839	64840	

Horizontal connection

	800-1200 A	Top	3P	64841	4P	64842
		Bottom		64843	64844	
	2500/3200 A	Top		64845	64846	
		Bottom		64847	64848	
	4000/5000 A	Top		64849	64850	
		Bottom		64851	64852	

Safety shutters + locking block

	800/3000 A	3P		As standard
		4P		As standard
	4000/5000 A	3P		As standard
		4P		As standard

Chassis accessories

Front face shutter locking

	800-5000 A	3P/4P		48931
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Shutter indicator

		3P/4P		48932
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Arc chute cover

		3P/4P		As standard
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Auxiliary terminal shield (CB)

	800/3000 A	3P		48595
		4P		48596
	4000/5000 A	3P		48597
		4P		48598



Chassis locking

Chassis locking

Disconnected position locking

	By padlocks		
		VCPO	As standard
	By Profalux keylocks		
	Profalux	1 lock with 1 key + adaptation kit	48568
		2 locks 1 key + adaptation kit	48569
		2 locks 2 different keys + adaptation kit	48570
	1 keylock Profalux (without adaptation kit):	identical key not identified combination	33173
		identical key identified 215470 combination	33174
		identical key identified 215471 combination	33175
	By Ronis keylocks		
	Ronis	1 lock with 1 key + adaptation kit	48572
		2 locks 1 key + adaptation kit	48573
		2 locks 2 different keys + adaptation kit	48574
	1 keylock Ronis (without adaptation kit):	identical key not identified combination	33189
identical key identified EL24135 combination		33190	
identical key identified EL24153 combination		33191	
	identical key identified EL24315 combination	33192	
Optional disconnected/test/connected position locking		33779	
Adaptation kit (without keylock):	adaptation kit Profalux / Ronis	48564	
	adaptation kit Kirk	48565	
	adaptation kit Castell	48566	

Door interlock (1 part)

	Right-hand side of chassis	48579
	Left-hand side of chassis	48580

Open door racking interlock (VPOC)

	1 part	48582
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Racking interlock between crank and OFF pushbutton (IBPO)

1 part	As standard
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Automatic spring discharge before breaker removal (DAE)

	1 part	As standard
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Breaker mismatch protection / cradle rejection kits (VDC)

	Breaker mismatch protection	As standard
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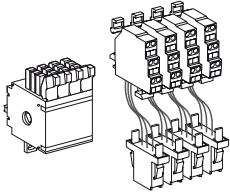


NW08 to NW50 drawout circuit breakers

Indication contacts

ON/OFF indication contacts (OF)

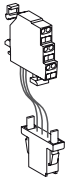
E-46889



Block of 4 changeover contacts (6 A - 240 V)	1 block - As standard
1 additional block of 4 contacts (2 max.)	48468

Combined closed / connected contacts for use with 1 auxiliary contact (EF)

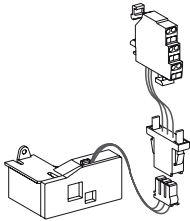
E-46690



1 contact (5 A - 240 V) (8 max.)	48477
or 1 low-level contact (8 max.)	48478

Fault trip indication contacts (SDE)

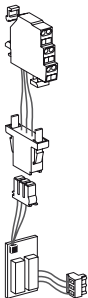
E-46891



Changeover contact (5 A - 240 V)	1 block - As standard
1 additional SDE (5 A - 240 V)	48475
or 1 additional low-level SDE	48476

Programmable contacts ⁽¹⁾ (programmed via Micrologic control unit)

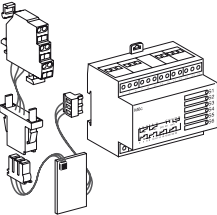
E-46703



2 contacts M2C (5 A - 240 V)	48382
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M2C.

E-46724



or 6 contacts M6C (5 A - 240 V)	48383
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⁽¹⁾ For Micrologic control units P and H only.

M6C.

Carriage switches (connected / disconnected / test position)

E-46661



Changeover contacts (8 A - 240 V)	
1 connected position contact (3 max.)	33751
1 test position contact (3 max.)	33752
1 disconnected position contact (3 max.)	33753
and/or low-level changeover contacts	
1 connected position contact (3 max.)	33754
1 test position contact (3 max.)	33755
1 disconnected position contact (3 max.)	33756
Actuator for additional carriage switches	48560

Auxiliary terminals for chassis alone

3 wire terminal (30 parts)	47898
6 wire terminal (10 parts)	47899
Jumpers (10 parts)	47900

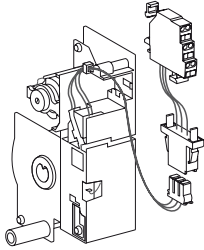


Remote operation

Remote ON/OFF

Gear motor

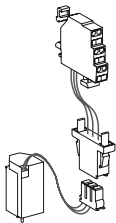
E46892



		MCH
AC 50/60 Hz	48 V	48522
	100/130 V	48526
	200/250 V	48527
	240/277 V	48528
	380/415 V	48529
	440/480 V	48530
DC	24/30 V	48521
	48/60 V	48522
	100/125 V	48523
	200/250 V	48524

Instantaneous voltage releases

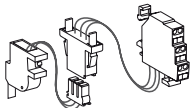
E46893



		Closing release	Opening release	
Standard	AC 50/60 Hz	XF	MX	
		48480	48490	
	DC	48481	48491	
		48 V AC/DC	48482	48492
		120 V AC/DC	48483	48493
		240 V AC/DC	48484	48494
		277 V AC	48485	48495
		380/480 V AC	48486	48496
Communicating	AC 50/60 Hz	XF com	MX com	
		48448	48457	
	DC	48449	48458	
		48 V AC/DC	48450	48459
		120 V AC/DC	48451	48460
		240 V AC/DC	48452	48461
		277 V AC	48453	48462
		380/480 V AC	48454	48463

Ready to close contact (1 max.)

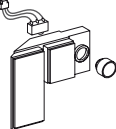
E46895



		PF
1 changeover contact (5 A - 240 V)		48469
	1 low-level changeover contact	48470

Electrical closing pushbutton

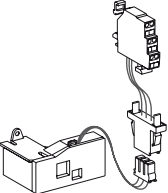
E46877



		BPFE
1 pushbutton		48534

Remote reset after fault trip

E46891

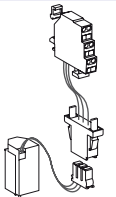


		Res
Electrical reset	110/130 V AC	48472
	220/240 V AC	48473
Automatic reset		RAR
Adaptation		47346

Remote tripping

Instantaneous voltage release

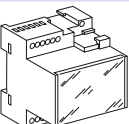
E46893



		2 nd MX	or	MN
AC 50/60 Hz	12 V DC	48510		
	24 V AC/DC	48511		48501
DC	48 V AC/DC	48512		48502
	120 V AC/DC	48513		48503
	240 V AC/DC	48514		48504
	277 V AC	48515		
	380/480 V AC	48516		48506

Delay unit

E46894



		R (non-adjustable)	Rr (adjustable)
AC 50/60 Hz	48/60 V AC/DC		33680
	100/130 V AC/DC	33684	33681
DC	200/250 V AC/DC	33685	33682
	380/480 V AC/DC		33683

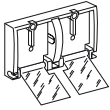


Accessories for NW08 to NW50 fixed and drawout circuit breakers

Circuit breaker locking

Pushbutton locking device

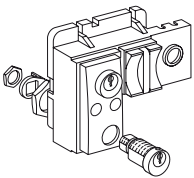
E46866



By padlocks	48536
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OFF position locking

E46735



By padlocks		
	VCPO	48539
By Profalux keylocks		
Profalux	1 lock with 1 key + adaptation kit	48545
	2 locks 1 key + adaptation kit	48546
	2 locks 2 different keys + adaptation kit	48547
1 keylock Profalux (without adaptation kit):	identical key not identified combination	33173
	identical key identified 215470 combination	33174
	identical key identified 215471 combination	33175
By Ronis keylocks		
Ronis	1 lock with 1 key + adaptation kit	48549
	2 locks 1 key + adaptation kit	48550
	2 locks 2 different keys + adaptation kit	48551
1 keylock Ronis (without adaptation kit):	identical key not identified combination	33189
	identical key identified EL24135 combination	33190
	identical key identified EL24153 combination	33191
	identical key identified EL24315 combination	33192
Adaptation kit (without keylock):	adaptation kit Profalux / Ronis	48541
	adaptation kit Kirk	48542
	adaptation kit Castell	48543

Cable-type door interlock

E70742



1 complete assembly for Masterpact NW fixed or drawout device	48614
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Other circuit breaker accessories

Mechanical operation counter

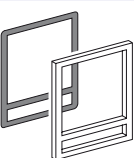
E46667



Operation counter CDM	48535
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Escutcheon and accessories

E46879



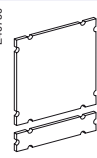
Escutcheon

E46880



Cover

E46736



Blanking plate

	Fixed	Drawout
Escutcheon	48601	48603
Transparent cover IP54		48604
Escutcheon blanking plate	48605	48605



Accessories for Micrologic control units

External sensor for neutral + residual earth-fault protection (TCE)

E46871 	CT rating: 400/2000 A		34035
	CT rating: 1000/4000 A		34036
	CT rating: 2000/6300 A		48182

Source ground return (SGR) earth fault protection

E46872 	External sensor (SGR)		33579
	MDGF summing module		48891

Voltage measurement input (for breakers supplied via bottom terminals) (PTE)

E46890 	Voltage measurement input.	Fixed	47506
	Can be only used for Micrologic control unit H and P.	Drawout	48533

Zone Selective Interlocking option for Micrologic P and H

ZSI	As standard
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External power supply module

DB105380 	24-30 V DC	54440
	48-60 V DC	54441
	100-125 V DC	54442
	110-130 V AC	54443
	200-240 V AC	54444
	380-415 V AC	54445

Battery module

E47787 	1 battery 24 V	54446
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Mechanical interlocking for source changeover

Interlocking of 2 devices using connecting rods

DB108565 	Complete assembly with 2 adaptation fixtures + rods	
	2 Masterpact NW fixed devices	48612
	2 Masterpact NW drawout devices	48612
	<i>Can be used with 1 NW fixed + 1 NW drawout</i>	

Interlocking of 2 devices using cables ⁽¹⁾

Choose 2 adaptation fixtures (1 for each breaker) + 1 set of cables	
1 adaptation fixture for Masterpact NW fixed devices	47926
1 adaptation fixture for Masterpact NW drawout devices	47926
1 set of cables	33209

⁽¹⁾ Can be used with any combination of NT or NW, fixed or drawout devices.

Interlocking of 3 devices using cables ⁽¹⁾

Choose 3 adaptation (including 3 adaptations fixtures + cables)	
3 sources, only 1 device closed, fixed or drawout devices	48610
2 sources + 1 coupling, fixed or drawout devices	48609
2 normal + 1 replacement source, fixed or drawout devices	48608

Test equipment

Mini test kit

E59821 	Hand held test kit (HHTK)	33594
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Portable test kit

E59854 	Full function test kit (FFTK)	33595
	Test report edition come from FFTK	34559
	FFTK test cable 2 pin for STR trip unit	34560
	FFTK test cable 7 pin for Micrologic trip unit	33590



NW08 to NW50 circuit breakers with neutral on the right

Circuit breakers

A 4 pole Masterpact circuit breaker with neutral on the right is described by the same catalogue numbers as a standard 4 pole one, except for the basic circuit breaker and chassis, which are specific.

Basic fixed circuit breaker with neutral on the right

Type H

	Frame rating	Interrupting current (KAIR RMS for U = 480 V)	4P
NW08	800	100	64695
NW12	1200	100	64697
NW16	1600	100	64698
NW20	2000	100	64699
NW25	2500	100	64700
NW30	3000	100	64701
NW40	4000	100	64702
NW50	5000	100	64703

Basic drawout circuit breaker with neutral on the right

Type H

	Frame rating	Interrupting current (KAIR RMS for U = 480 V)	4P
NW08	800	100	64704
NW12	1200	100	64706
NW16	1600	100	64707
NW20	2000	100	64708
NW25	2500	100	64709
NW30	3000	100	64710
NW40	4000	100	64711
NW50	5000	100	64712

Chassis with neutral on the right

Type H

	4P
NW08	64728
NW12	64732
NW16	64734
NW20	64736
NW25	64738
NW30	64740
NW40	64742
NW50	64744



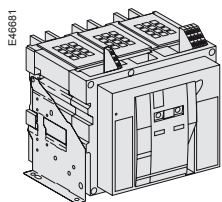
NW08 to NW50 switch-disconnectors

Switch-disconnectors

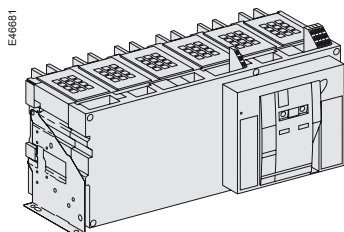
A Masterpact fixed switch-disconnector is described by 3 catalogue numbers corresponding to:

- the basic switch-disconnector
- a top connection see page F-14
- a bottom connection see page F-14.

A communication option and various auxiliaries and accessories may also be added.



Basic switch-disconnector ≤ 3000 A.

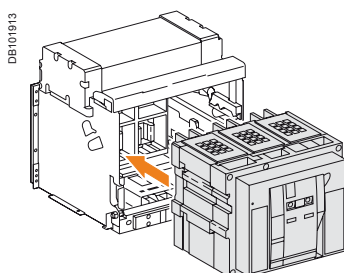


Basic switch-disconnector > 3000 A.

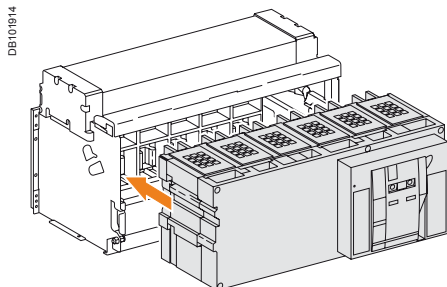
A Masterpact drawout switch-disconnector is described by 4 catalogue numbers corresponding to:

- the basic switch-disconnector
- a chassis
- a top connection see page F-18
- a bottom connection see page F-18.

A communication option and various auxiliaries and accessories may also be added.



Basic switch-disconnector + chassis ≤ 3000 A.



Basic switch-disconnector + chassis > 3000 A.

Basic fixed switch-disconnector

Type HF		3P	4P	
	Frame rating	Interrupting current (KAIR RMS for U = 480 V)		
NW08	800	100	64755	64756
NW12	1200	100	64757	64758
NW16	1600	100	64759	64760
NW20	2000	100	64761	64762
NW25	2500	100	64763	64764
NW30	3000	100	64765	64766
NW40	4000	100	64767	64768
NW50	5000	100	64769	64770

Communication option

	Switch-disconnector
COM Modbus	48188

Basic drawout switch-disconnector

Type HF		3P	4P	
	Frame rating	Interrupting current (KAIR RMS for U = 480 V)		
NW08	800	100	64771	64772
NW12	1200	100	64773	64774
NW16	1600	100	64775	64776
NW20	2000	100	64777	64778
NW25	2500	100	64779	64780
NW30	3000	100	64781	64782
NW40	4000	100	64783	64784
NW50	5000	100	64785	64786

Chassis

Type H/HF		3P	4P
NW08		64727	64728
NW12		64731	64732
NW16		64733	64734
NW20		64735	64736
NW25		64737	64738
NW30		64739	64740
NW40		64741	64742
NW50		64743	64744

Communication option

	Chassis	Switch-disconnector
COM Modbus	33852	48384



Name of customer: _____
 Address for delivery: _____
 Requested delivery date: _____
 Customer order no.: _____

To indicate your choices, check the applicable square
 and enter the appropriate information in the rectangles.

Circuit breaker or automatic switch		Quantity
Masterpact type	NT <input type="checkbox"/> NW <input type="checkbox"/>	
Rating	A <input type="text"/>	
Sensor rating	A <input type="text"/>	
Circuit breaker	NT: N, L1 <input type="text"/>	
	NW: N, H <input type="text"/>	
Automatic switch	HF <input type="text"/>	
Number of poles	3 or 4 <input type="text"/>	
Brand	MG <input type="text"/> SD <input type="text"/>	
Option: neutral on right side (NW only)	<input type="checkbox"/>	
Type of equipment	Fixed <input type="checkbox"/>	
	Drawout with chassis <input type="checkbox"/>	
	Drawout without chassis (moving part only) <input type="checkbox"/>	
	Chassis alone <input type="checkbox"/>	

Micrologic control unit			
A - ammeter	3.0 <input type="checkbox"/>	5.0 <input type="checkbox"/>	6.0 <input type="checkbox"/>
P - power meter		5.0 <input type="checkbox"/>	6.0 <input type="checkbox"/>
H - harmonic meter		5.0 <input type="checkbox"/>	6.0 <input type="checkbox"/>
LR - long-time rating plug	Standard 0.4 to 1r <input type="checkbox"/>		
Plug:	B, C, D, E, F, G, H <input type="checkbox"/>		
AD - external power-supply module		V <input type="checkbox"/>	
BAT - battery module	<input type="checkbox"/>		
TCE - external sensor (CT) for neutral and residual ground-fault protection	<input type="checkbox"/>		
TCW - external sensor for SGR protection	<input type="checkbox"/>		
PTE - external voltage connector	<input type="checkbox"/>		

Communication			
COM module	JBus/ModBus	Device <input type="checkbox"/>	Chassis <input type="checkbox"/>

Connection			
Horizontal	Top <input type="checkbox"/>		Bottom <input type="checkbox"/>
Vertical	Top <input type="checkbox"/>		Bottom <input type="checkbox"/>
Front (NT only)	Top <input type="checkbox"/>		Bottom <input type="checkbox"/>

Micrologic control unit functions:
 3.0: protection de base LI
 5.0: selective protection (long time + short time + inst.)
 6.0: selective + ground-fault protection (long time + short time + inst. + ground-fault)

Indication contacts

OF - ON/OFF indication contacts			
Standard	4 OF 6 A-240 V AC (10 A-240 V AC and low-level for NW)		
Alternate	1 OF low-level for NT	Max. 4	qty <input type="text"/>
Additional	1 block of 4 OF for NW	Max. 2	qty <input type="text"/>
EF - combined "connected/closed" contacts			
	1 EF 6 A-240 V AC for NW	Max. 8	qty <input type="text"/>
	1 EF low-level for NW	Max. 8	qty <input type="text"/>

SDE - "fault-trip" indication contact			
Standard	1 SDE 6 A-240 V AC		
Additional	1 SDE 6 A-240 V AC <input type="checkbox"/>	1 SDE low level	<input type="text"/>
Programmable contacts			
	2 M2C contacts <input type="checkbox"/>	6 M6C contacts	<input type="text"/>
Carriage switches			
	Low level <input type="checkbox"/>	6 A-240 V AC	<input type="text"/>
CE - "connected" position	Max. 3 for NW/NT		qty <input type="text"/>
CD - "disconnected" position	Max. 3 for NW - 2 for NT		qty <input type="text"/>
CT - "test" position	Max. 3 for NW - 1 for NT		qty <input type="text"/>
AC - NW actuator for 6 CE - 3 CD - 0 CT additional carriage switches			qty <input type="text"/>

Remote operation			
Remote ON/OFF			
MCH - gear motor		V	<input type="checkbox"/>
XF - closing voltage release		V	<input type="checkbox"/>
MX - opening voltage release		V	<input type="checkbox"/>
PF - "ready to close" contact	Low level		<input type="checkbox"/>
	6 A-240 V AC		<input type="checkbox"/>
BPFE - electrical closing pushbutton			<input type="checkbox"/>
RES - electrical reset option		V	<input type="checkbox"/>
Remote tripping			
MN - undervoltage release		V	<input type="checkbox"/>
R - delay unit (non-adjustable)			<input type="checkbox"/>
Rr - adjustable delay unit			<input type="checkbox"/>
2 nd MX - shunt release		V	<input type="checkbox"/>

Locking

VBP - ON/OFF pushbutton locking (by transparent cover + padlocks)			
OFF position locking:			
VCPO - by padlocks			
VSPO - by keylocks:	Keylock kit (without keylock)	Profalux <input type="checkbox"/>	Ronis <input type="checkbox"/>
		Kirk <input type="checkbox"/>	Castell <input type="checkbox"/>
	1 keylock	Profalux <input type="checkbox"/>	Ronis <input type="checkbox"/>
	2 identical keylocks, 1 key	Profalux <input type="checkbox"/>	Ronis <input type="checkbox"/>
	2 keylocks, different keys	Profalux <input type="checkbox"/>	Ronis <input type="checkbox"/>
Chassis locking in "disconnected" position:			
VSPD - by keylocks	Keylock kit (without keylock)	Profalux <input type="checkbox"/>	Ronis <input type="checkbox"/>
		Kirk <input type="checkbox"/>	Castell <input type="checkbox"/>
	1 keylock	Profalux <input type="checkbox"/>	Ronis <input type="checkbox"/>
	1 keylock	Profalux <input type="checkbox"/>	Ronis <input type="checkbox"/>
	2 keylocks, different keys	Profalux <input type="checkbox"/>	Ronis <input type="checkbox"/>
	Optional connected/disconnected/test position lock <input type="checkbox"/>		

VPEC - door interlock	On right-hand side chassis <input type="checkbox"/>
	On left-hand side chassis <input type="checkbox"/>
VPOC - racking interlock	<input type="checkbox"/>
IPA - cable-type door interlock	<input type="checkbox"/>
VDC - mismatch protection (standard)	<input type="checkbox"/>
IBPO - racking interlock between crank and OFF pushbutton for NW (standard)	<input type="checkbox"/>
DAE - automatic spring discharge before breaker removal for NW (standard)	<input type="checkbox"/>

Accessories

VO - safety shutters on chassis for NT and NW (standard)		X
CDM - mechanical operation counter NT, NW		
CB - auxiliary terminal shield for chassis NT, NW		
CDP - escutcheon NT, NW		
CP - transparent cover for escutcheon NT, NW		
OP - blanking plate for escutcheon NT, NW		
Brackets for mounting	NW fixed <input type="checkbox"/>	On backplates <input type="checkbox"/>
Test kits	Mini test kit <input type="checkbox"/>	Portable test kit <input type="checkbox"/>
IV - shutter position indicator for NW		
VV - shutter-locking system for NW		

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