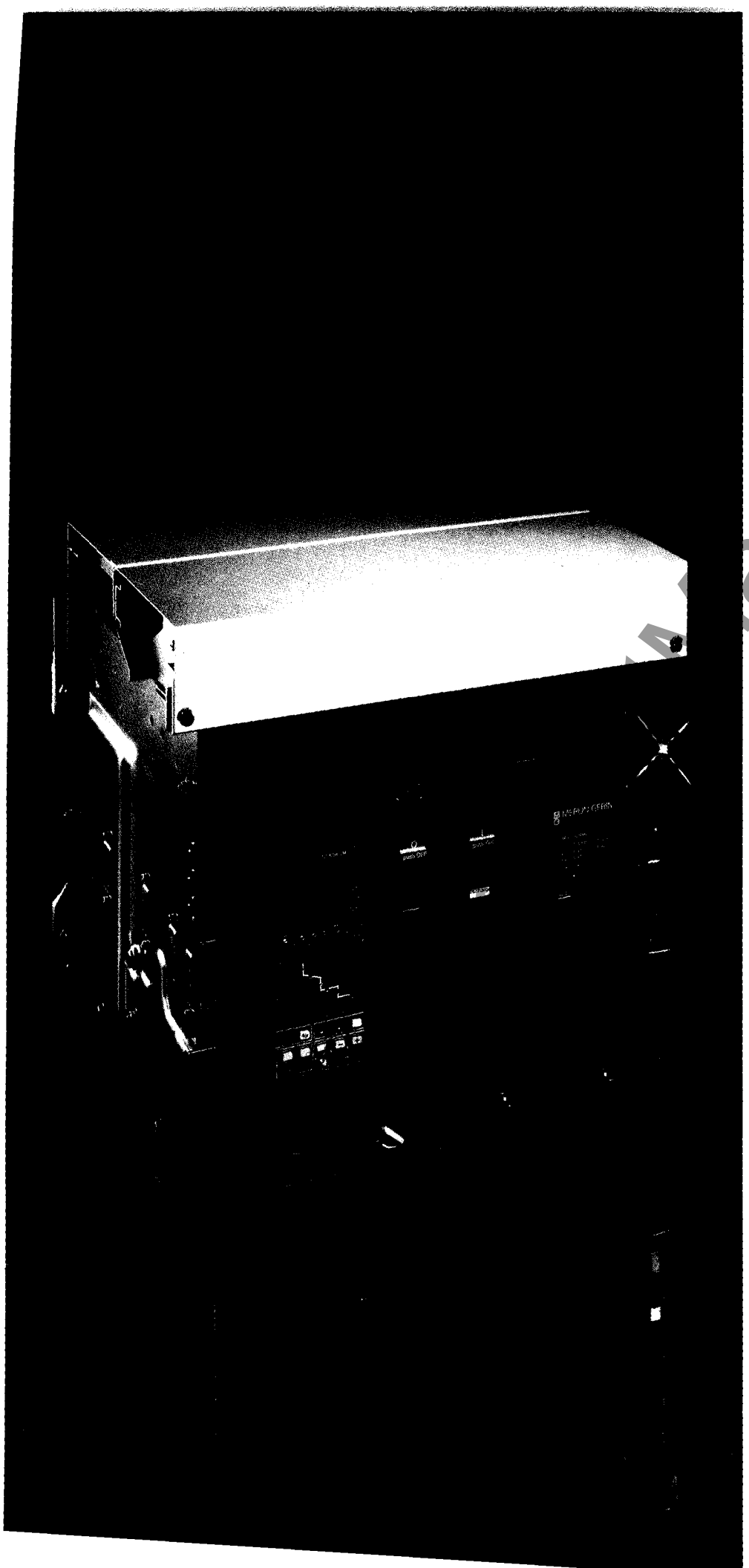


Masterpact LV air circuit breaker

contents

from 800 to 6300 A

the right choice

- 3 or 4 poles,
- a range of control units, offering multiple functions
- breaking capacity: from 30 to 130 kA rms
- voltage rating 660 V AC.

3 types of breakers for 3 performance levels

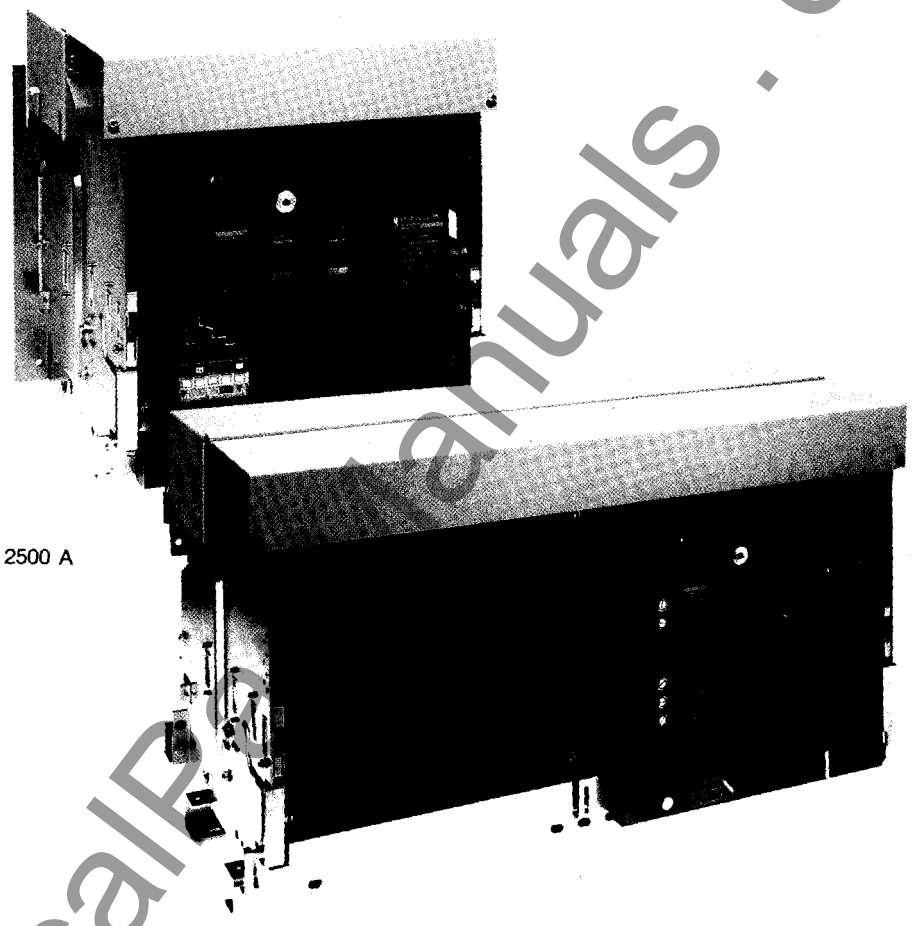
N1: standard,
H1, H2: high performance,
L1: current limiting.

compliance with international requirements

standards
IEC 157-1 (and future IEC)
BS 4752,
UL 489 Listed,
JEC 160,
JIS C8372,
UTE C63-120
VDE 0660,
NEMA,

Certifications
ASEFA, ASTA, CESI

Merchant Marine
LRS, BV, GL, USSR RS, DNV, ABS
(consult Merlin Gerin regarding performance to Marine classifications)



2500 A

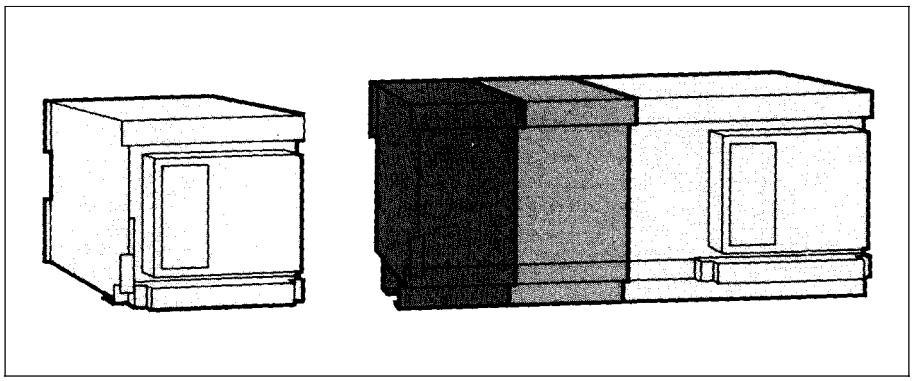
5000 A

Breaking capacity (kA rms, IEC P2 380/415 V)

current rating (A)		800 to 1600	2000/2500	3200	4000	5000	6300
type	N1 standard	30	50				
	H1 high performance	50	65	65	75	100	100
	H2 high performance	80	80	80	85	120	120
	L1 limiting	130	130				

reduced dimensions

Common dimensions from 800 to 3200 A.
Common height and depth from 4000 to 6300 A.



control units with new functions

In addition to conventional functions such as:
- short time protection,
- long time protection,
- high set instantaneous protection,
- earth fault protection.

New functions include:
- load monitoring and control,
- remote indications,
- measurement of phase currents, max. current, fault currents and fault current totals,
- zone selective interlocking for earth fault protection,
- remote transmission of data,
- self monitoring.

All these functions are used increasingly in automated distribution systems.

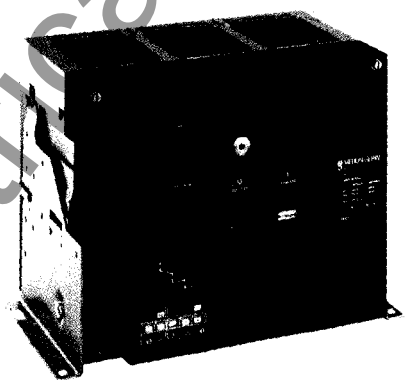
other possibilities

fixed breaker

The fixed circuit breaker is derived from the moving part of the drawout breaker by adding a fixing bracket on each side.

unprotected breaker

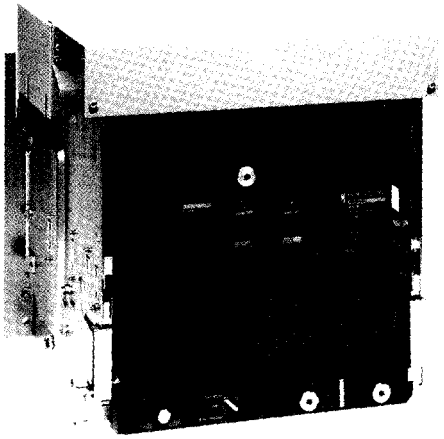
The unprotected breaker is derived directly from the standard circuit breaker and excludes the control unit.
- standard: type HI and NI
- high performance: type HF, equipped with a protection system that instantaneously opens the breaker in the event of closure on fault conditions (making current release).

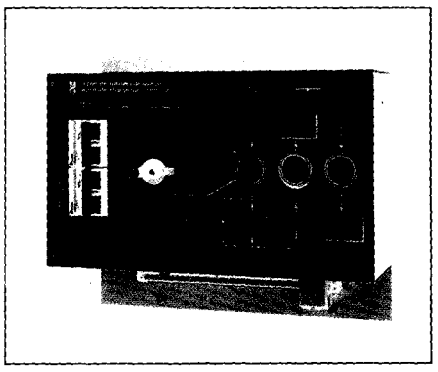


fixed breaker

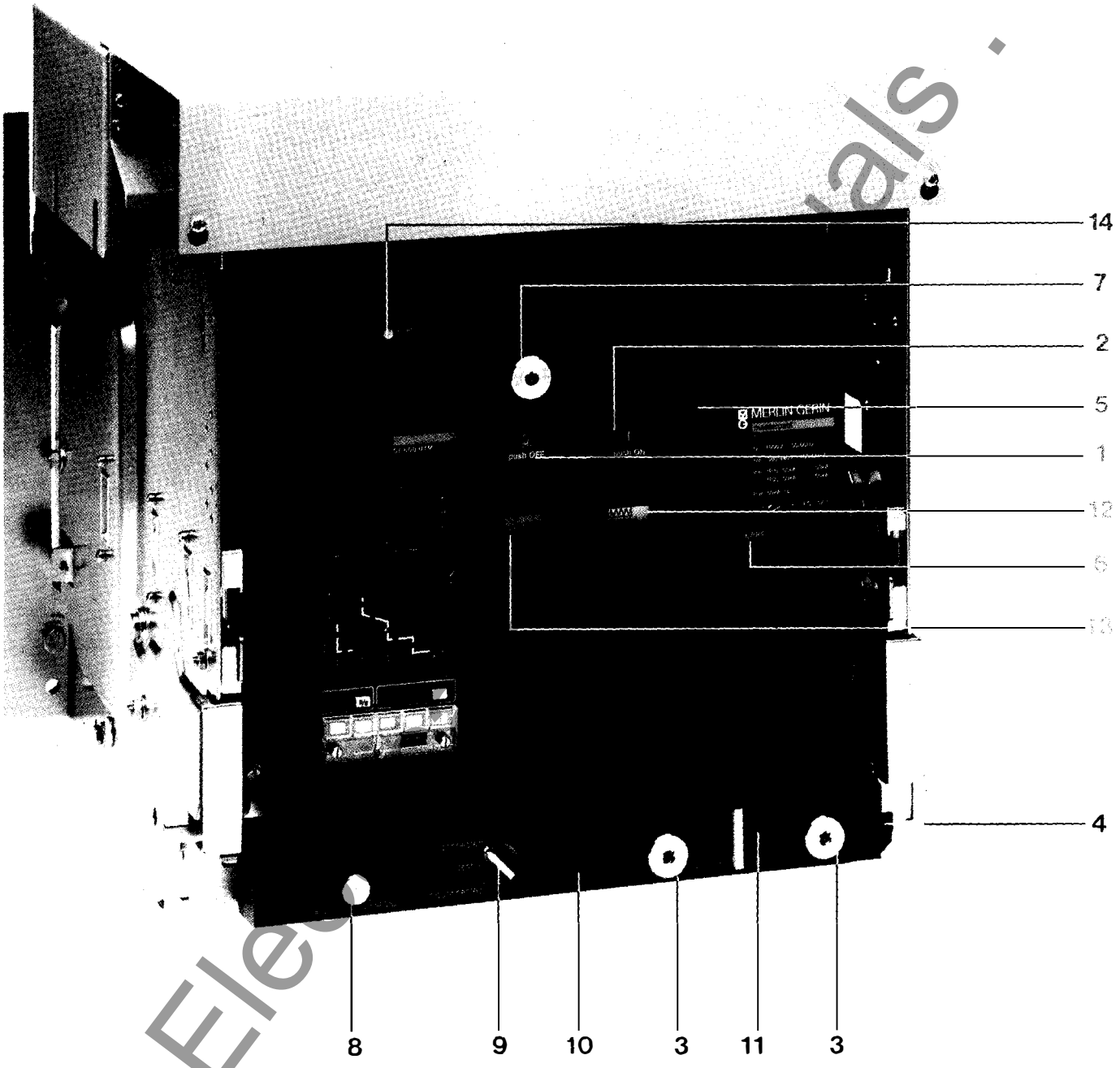
source changeover

Four solutions are available:
- mechanical interlocking for 2 or 3 breakers, adaptable to various source changeover configurations,
- automatic source changeover controller, easy to implement on any two suitably equipped circuit breakers (electrically charged operating mechanism, etc.),
- complete assembly including 2 or 3 mechanically interlocked breakers by links adaptable to various source changeover configurations,
- complete assembly including 2 mechanically interlocked breakers by links and an automatic source changeover controller, adaptable to various source changeover configurations. Ready for connection.





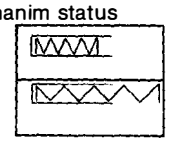
Automatic source changeover controller.



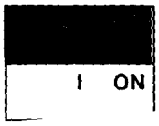
front face

1 opening push-button (O)
2 closing push-button (I)
3 keylocks for "connected", "disconnected" or "test" position
4 door interlock
5 stored energy mechanism charging handle
6 operations counter
7 "open" position keylock
8 racking handle storage
9 functional position indicator: "connected", "test" and "disconnected"
10 controls on fixed frame (accessible

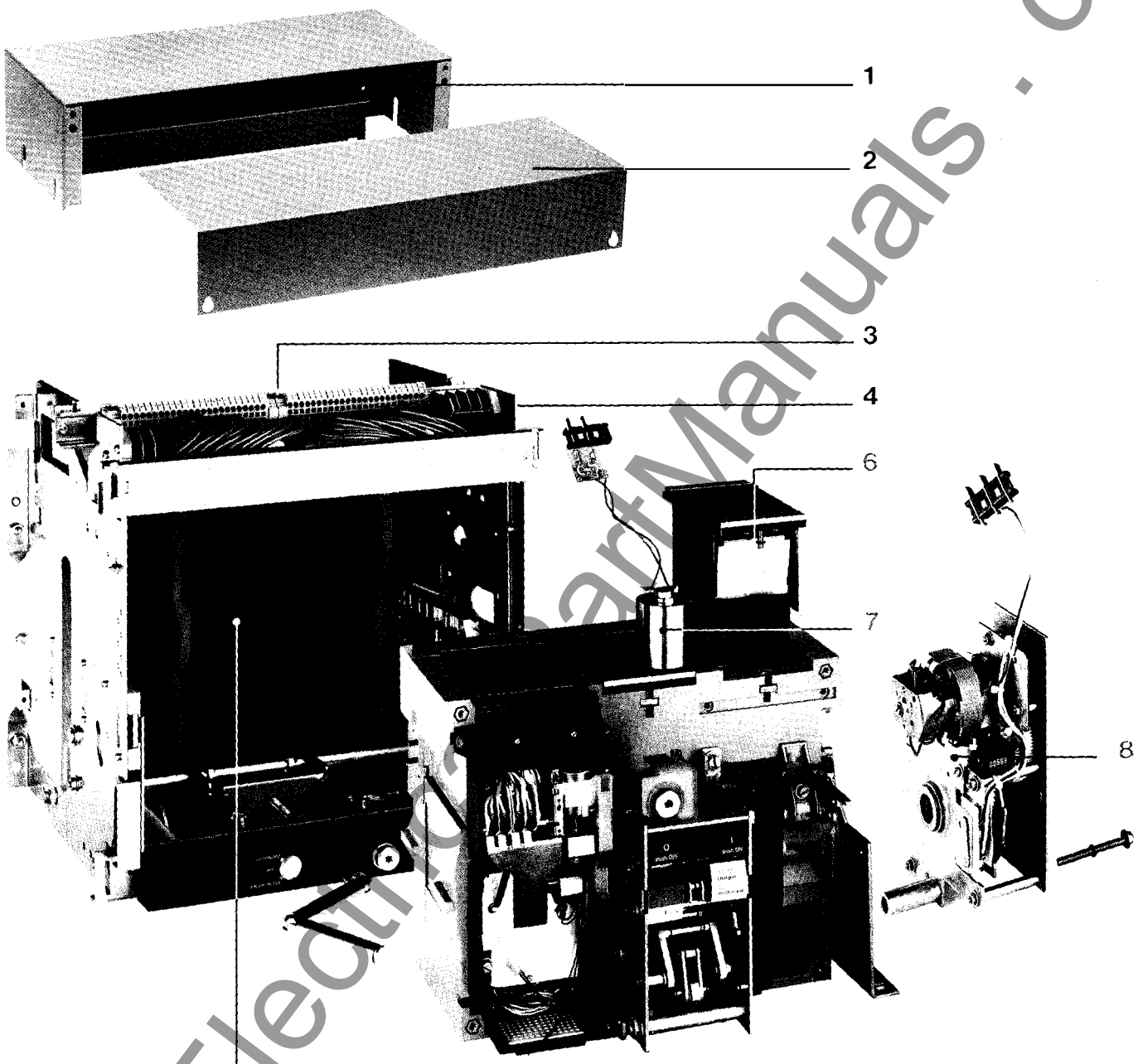
12 stored energy mechanim status indicator
- "charged"
- "discharged"

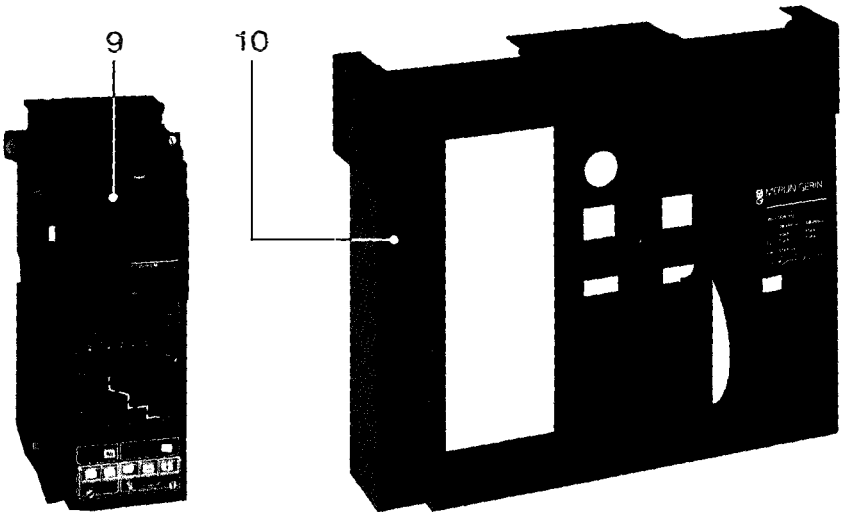


13 main contact position indicator
- "Off" (O)
- "On" (I)



LV circuit breaker: blue figures
Enclosure: red figures





drawout version

1 arc chute cover
2 auxiliary terminal shield
3 auxiliaries connection block
4 fixed integral enclosure, forms the drawout chassis
5 safety shutters
6 arc chute
7 remote control voltage release
8 motor for electrical charging of stored energy mechanism
9 control unit
10 front cover

Masterpact LV air circuit breaker

safety and reliability

- reduced, simple maintenance (main contacts easily accessible, with wear indication feature)
- double insulation from the front face
- positive contact indication
- auxiliary devices can be fitted on site without adjustment
- fewer parts than conventional ranges (by a factor of 5-10)
- a trip interlock ensures that the circuit breaker is open during connection and disconnection
- connection to top or bottom terminals
- fully tropicalised as standard

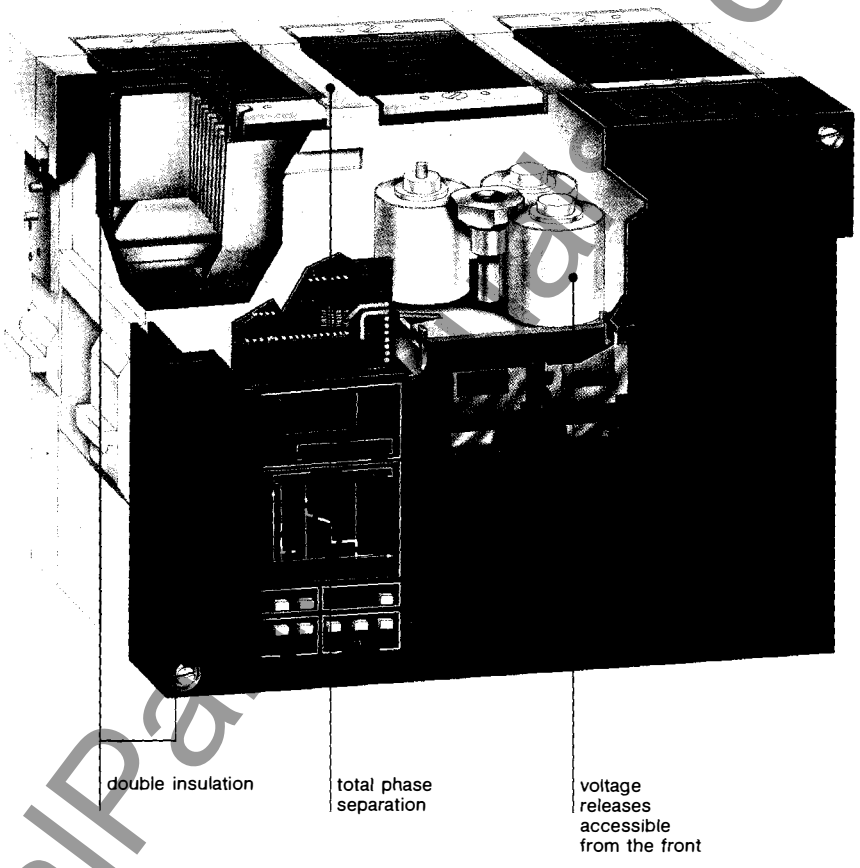
stored energy operating mechanism

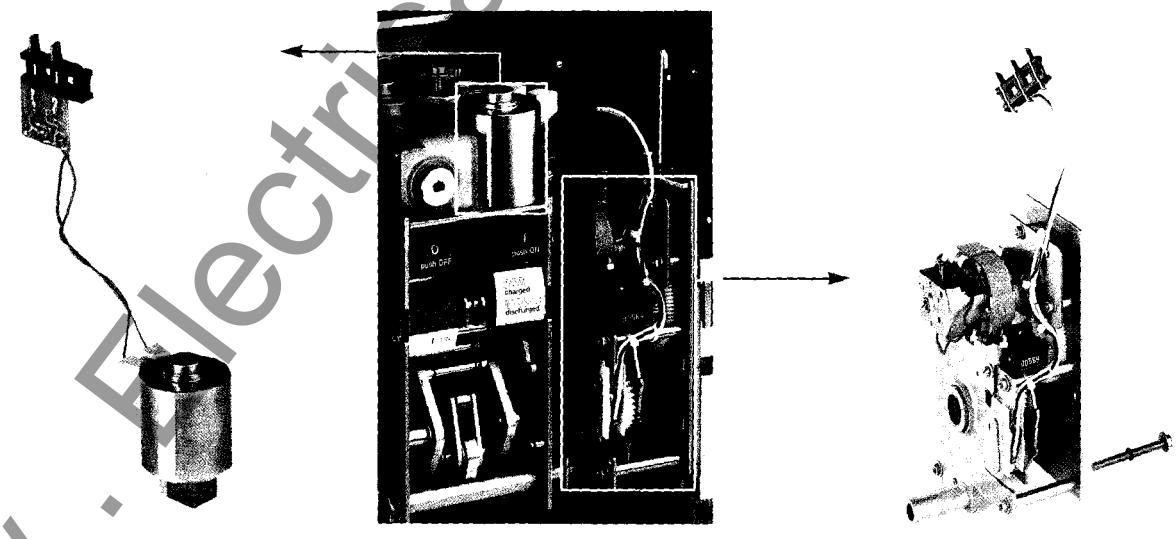
Masterpact circuit breakers are operated via a stored energy mechanism for instantaneous opening and closing.
The mechanism is charged either manually or electrically.
Closing and opening operations can be initiated either from the local pushbuttons on the circuit breaker front face, or by remote control.

common auxiliaries from 800 A to 6 300 A

Auxiliaries :

- accessible from the front, mounted in a separate compartment insulated from power circuits,
- secured by a single screw,
- adjustment-free,
- can be fitted on site.



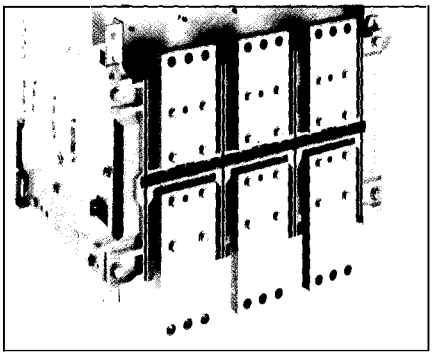


Voltage release

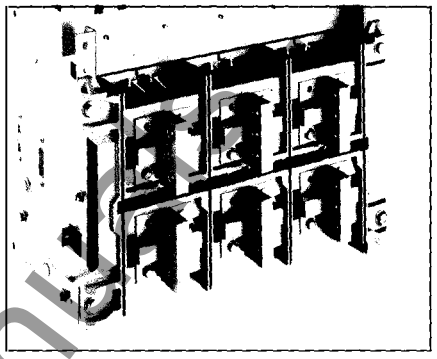
Motor for electrical charging of stored energy mechanism

a new drawout breaker design

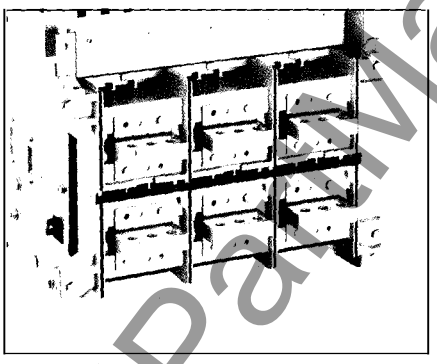
All types of main circuit connections available



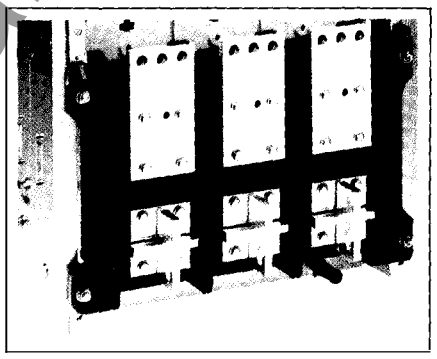
Front



Rear vertical

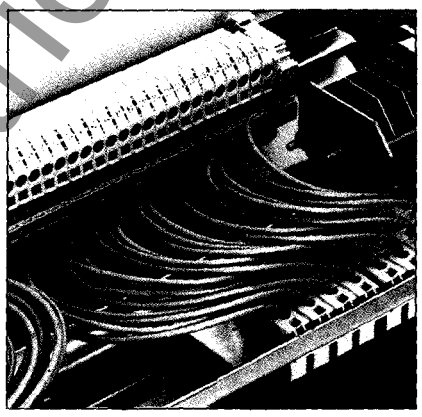


Rear horizontal

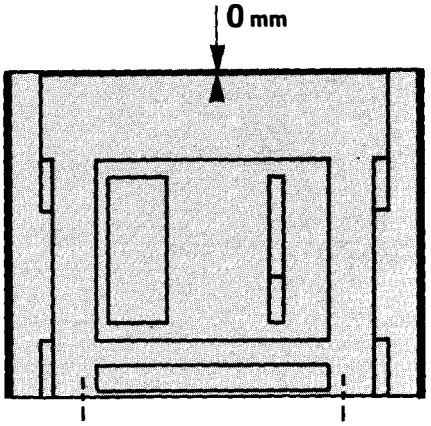


Top: Front
Bottom: Vertical

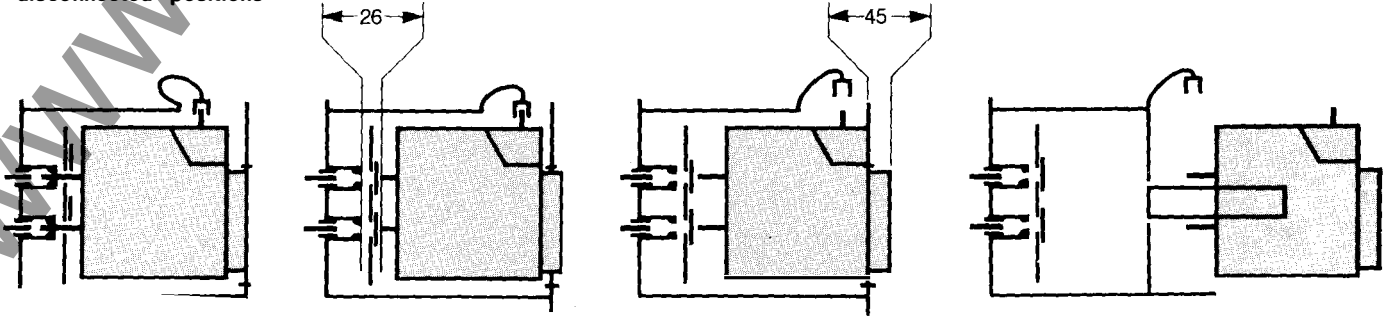
Front connection of auxiliary circuits
- wired via automatic disconnecting contacs,
- by screwless tunnel terminals



Safety clearance
The arc chute cover eliminates the need for the top safety clearance (drawout breaker with rear connections only)



Increased safety in "test" and "disconnected" positions



Masterpact M08 to M63: characteristics

electrical characteristics[3]			M08				M10				M12			
rated current (A at 40 °C)[1]			800				1 000				1 250			
rated voltage (V 50/60 Hz)			660				660				660			
insulation level (V 50/60 Hz cat. C)			1 000				1 000				1 000			
number of poles			3,4				3,4				3,4			
4th pole rating (A)			800				1 000				1 250			
type of circuit breaker			N1	H1	H2	L1	N1	H1	H2	L1	N1	H1	H2	L1
breaking capacity AC 50/60 Hz (kA rms) **declined for:** ■ pf = 0.25 if 20 < kA rms ≤ 50 ■ pf = 0.20 if kA rms > 50	IEC-P2 (O-CO-CO cycle)	220/415 V	30	50	80	130	30	50	80	130	30	50	80	1 0
		440 V	30	50	80	110	30	50	80	110	30	50	80	110
		500/660 V	30	50	65	65	30	50	65	65	30	50	65	65
	CEI-P1 (O-CO cycle)	220/415 V	30	50	100	130	30	50	100	130	30	50	100	130
		440V	30	50	100	110	30	50	100	110	30	50	100	110
		500/600 V	30	50	85	65	30	50	85	65	30	50	85	65
	NEMA (O-CO cycle)	480 V	30	50	100	100	30	50	100	100	30	50	100	100
		600 V	30	50	85	65	30	50	85	65	30	50	85	65
making capacity (P1 cycle)	(kA peak)	220/415 V	63	105	220	286	63	105	220	286	63	105	220	286
		440 V	63	105	220	242	63	105	220	242	63	105	220	242
		500/660 V	63	105	187	143	63	105	187	143	63	105	187	143
peak withstand capacity (kA peak)			63	105	105	24	63	105	105	24	63	105	105	24
short time withstand capacity (kA rms)	1s		30	50	50	12	30	50	50	12	30	50	50	12
	3s		22	32	32	12	22	32	32	12	22	32	32	12
operating times	total breaking time (max)		25 to 30 ms with no intentional delay – 9 ms for version L1											
	closing time		60 ms (40 ms: consult us)											

protection														
sensor ratings (A) (see selection below)			200 to 800[4]				200 to 1 000[4]				200 to 1 250[4]			
control unit protection type:	instantaneous	ST108	■	■	■		■	■	■		■	■	■	
		ST128	■	■	■		■	■	■		■	■	■	
	standard	ST208D	■	■	■		■	■	■		■	■	■	
	selective	ST308S/ST318S	■	■	■ [7]		■	■	■ [7]		■	■	■ [7]	
		ST408S/ST418S	■	■	■ [7]		■	■	■ [7]		■	■	■ [7]	
		ST308L				■				■				■
	universal	ST608U[4]	■	■	■	■	■	■	■	■	■	■	■	■
unprotected circuit breaker type			NI	HI	HF		NI	HI	HF		NI	HI	HF	
	dummy unit	ST008	■	■			■	■			■	■		
	trip unit	ST018			■				■				■	
making capacity (kA peak)			56	105	143		56	105	143		56	105	143	
short time withstand capacity 1s (kA rms)			27	50	50		27	50	50		27	50	50	

other characteristics														
endurance mechanical		without maint.	10 000	10 000	10 000	10 000	10 000	10 000	10 000	10 000	10 000	10 000	10 000	10 000
		with maint.	20 000	20 000	20 000	20 000	20 000	20 000	20 000	20 000	20 000	20 000	20 000	15 000
electrical at 660 V	breaker	without maint.	2 700	2 700	2 700	2 700	2 500	2 500	2 500	2 500	2 200	2 200	2 200	2 200
		with maint.	4 500	5 000	5 000	4 500	3 750	5 000	5 000	4 000	3 000	5 000	5 000	3 000
	for motor starting duty AC3-158-1[2]	without maintenance	5 000	5 000	5 000		5 000	5 000	5 000		5 000	5 000	5 000	
installation	connection		front	rear			front	rear			front	rear		
	version	drawout	■	■			■	■			■	■		
		fixed	■	■			■	■			■	■		
	dimensions (mm)	H × W × D	H	W	D		H	W	D		H	W	D	
		drawout 3 P	437	435	367		437	435	367		437	435	367	
		rear conn. 4 P	437	550	367		437	550	367		437	550	367	
		fixed 3 P	356	422	290		356	422	290		356	422	290	
		rear conn. 4 P	356	537	290		356	537	290		356	537	290	
	maximum weight (kg)	drawout 3 P	65			69	65			69	65			69
		4 P	80			85	80			85	80			85
		fixed 3 P	43			46	43			46	43			46
		4 P	54			58	54			58	54			58

auxiliaries and accessories identical for the entire Masterpact range

sensor selection

The following table gives:
- the entire range of available sensor ratings In,
- the long time current setting limits Ir.

In (A)	200	250	320	400	500	600	630	800	1 000	1 200	1 250	1 600	2 000	2 500	3 000	3 200	4 000	5 000	6 000	6 300
LT current	80	100	125	160	200	240	250	320	400	480	500	640	800	1 000	1 200					

	M16				M20				M25				M32		M40		M50		M63	
	1 600				2 000				2 500				3 200		4 000		5 000		6 300	
	660				660				660				660		660		660		660	
	1 000				1 000				1 000				1 000		1 000		1 000		1 000	
	3,4				3,4				3,4				3,4		3,4		3,4		3,4	
	1 600				2 000				2 500				3 200		4 000		2 500		3 200	
	N1	H1	H2	L1	N1	H1	H2	L1	N1	H1	H2	L1	H1[8]	H2	H1	H2	H1	H2	H1	H2
	30	50	80	130	50	65	80	130	50	65	80	130	75	80	75	85	100[6]	120	100[6]	120
	30	50	80	110	50	65	80	110	50	65	80	110	75	80	75	85	100[6]	120	100[6]	120
	30	50	65	65	50	65	65	65	50	65	65	65	75	65	75	75	75	85	75	85
	30	50	100	130	50	65	100	130	50	65	100	130	75	100	75	100	100[6]	150	100[6]	150
	30	50	100	110	50	65	100	110	50	65	100	110	75	100	75	100	100[6]	150	100[6]	150
	30	50	85	65	50	65	85	65	50	65	85	65	75	85	75	85	75	85	75	85
	30	50	100	100	50	65	100	100	50	65	100	100	75	100	75	100	100[6]	150	100[6]	150
	30	50	85	65	50	65	85	65	50	65	85	65	75	85	75	85	85	100	85	100
	63	105	220	286	105	143	220	286	105	143	220	286	165	220	165	220	220	330	220	330
	63	105	220	242	105	143	220	242	105	143	220	242	165	220	165	220	220	330	220	330
	63	105	187	143	105	143	187	143	105	143	187	143	165	187	165	187	165	187	165	187
	63	105	105	34	105	143	143	34	105	143	143	34	165	165	165	165	220	220	220	220
	30	50	50	17	50	65	65	17	50	65	65	17	75	75	75	75	100[6]	100	100[6]	100
	22	32	32	17	50	57	57	17	50	65	65	17	75	75	75	75	100[6]	100	100[6]	100
	25 to 30 ms with no intentional delay – 9 ms for version L1																			
	60 ms (40 ms : consult us)																			
	200 to 1 600				200 to 2 000				300 to 2 500				600 to 3 200		2 000 to 4 000		2 000 to 5 000		2 000 to 6 300	
	■	■	■		■	■	■		■	■	■		■	■						
	■	■	■		■	■	■		■	■	■		■	■	■	■	■	■	■	■
	■	■	■		■	■	■		■	■	■		■	■	■	■	■	■	■	■
	■	■	■ (7)		■	■	■ (7)		■	■	■ (7)		■	■ (7)	■	■ (7)	■	■ (7)	■	■ (7)
	■	■	■ (7)		■	■	■ (7)		■	■	■ (7)		■	■ (7)						
				■				■				■								
	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	NI	HI	HF		NI	HI	HF		NI	HI	HF		HI	HF	HI		HI		HI	
	■	■			■	■			■	■			■		■		■		■	
			■				■				■			■						
	56	105	143		84	105	143		84	105	143		105	143	105		187		187	
	27	50	50		40	50	65		40	50	65		50	65	50		85		85	
	10 000	10 000	10 000	10 000	10 000	10 000	10 000	10 000	10 000	10 000	10 000	10 000	10 000	10 000	5 000	5 000	5 000	5 000	5 000	5 000
	20 000	20 000	20 000	15 000	15 000	15 000	15 000	15 000	15 000	15 000	15 000	15 000	15 000	15 000	10 000	10 000	10 000	10 000	10 000	10 000
	2 000	2 000	2 000	2 000	1 800	1 800	1 800	1 800	1 500	1 500	1 500	1 500	1 200	1 200	1 000	1 000	1 000	1 000	1 000	1 000
	2 500	4 000	4 000	4 000	3 500	3 500	3 500	3 500	2 500	2 500	2 500	2 500	1 800	1 800	1 500	1 500	1 500	1 500	1 500	1 500
	4 000	4 000	4 000		3 500	3 500	3 500		2 500	2 500	2 500		1 800	1 800	1 500	1 500	1 500	1 500	1 500	1 500
	front	rear			front	rear			front	rear			front	rear	rear		rear		rear	
	■	■			■	■			■	■			■	■	■		■		■	
	■	■			■	■			■	■			■	■	■		■			
	H	W	D		H	W	D		H	W	D		H	W	D	H	W	D	H	W	D
	437	435	367		437	435	367		437	435	367		437	435	367	437	550	367	484	815	367	484	1045	367
	437	550	367		437	550	367		437	550	367		437	550	367	484	815	367	484	1045	367	484	1045	367
	356	422	290		356	422	290		356	422	290		356	422	290	356	537	290	356	802	290			
	356	537	290		356	537	290		356	537	290		356	537	290	356	802	290						
	69			82	82			130	82			130	130		150		210		250					
	85			102	102			150	102			150	150		200		260		300					
	46			46	46			80	55			80	80		90		110							
	58			69	69			90	69			90	90		110									

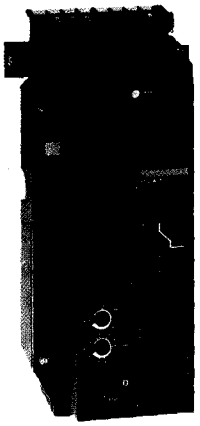
(1) For other temperatures, see page 50.
(2) Closing at 6 Ie and opening at Ie for 0.17 Un.
(3) For special applications (DC, 400 Hz, disturbed systems, etc.), consult us.
(4) For control unit ST608, the minimum rating In is 400 A (obtained using a 800 A sensor).
(5) Maintenance interval allowing the breaker to reach

Control units: page 11
Outline drawings and connections page 35
Time / current

Masterpact LV air circuit breaker

control units

ST108, ST128, ST208



ST208D

Basic functions

Instantaneous protection (ST108) against:
- short circuits with high set instantaneous tripping

Instantaneous protection (ST128) against:
- short circuits with adjustable instantaneous tripping

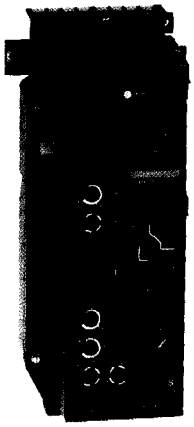
Standard protection (ST208) against:
- overloads;
- short circuits with adjustable pick-up.

Optional functions

Measurement:
- ammeter.

Testing:
- simplified test kit (mini-battery unit),
- calibration test kit.

ST308/318, ST408/418



ST418ST
with ammeter
option

Basic functions

Selective protection against:
- overloads with fixed or adjustable time delay,
- short circuits with or without time discrimination.

Optional functions

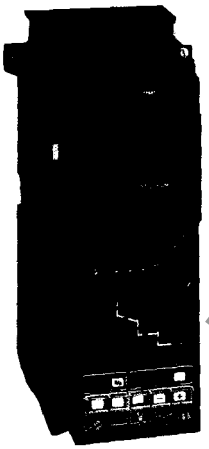
Protection against:
- earth faults with or without zone selective interlocking.

Measurement:
- ammeter.

Monitoring and control:
- load monitoring and control,
- front face and remote indications.

Testing:
- simplified test kit (mini battery unit),
- calibration test kit.

ST608 microprocessor based



ST608UM

Basic functions

Protection against:
- overloads with adjustable time delay,
- short circuits with or without time discrimination.

Measurement:
- ammeter.

Monitoring and control:
- front face indications,
- fault trip overcurrent display and memory,
- self-monitoring,
- maintenance indicator.

Testing:
- integral.

Optional functions

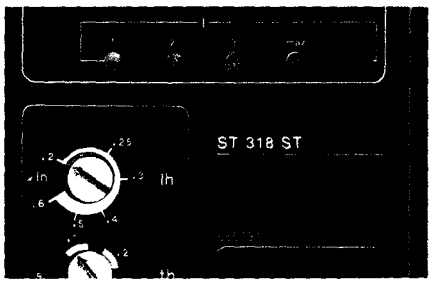
Protection against:
- earth faults with or without zone selective interlocking.

Monitoring and control:
- load monitoring and control,
- remote indications,
- transmissions of settings, fault currents, self-monitoring information and maintenance indicator data.

Note
All protection functions are self-powered and require no auxiliary power supply. Complementary functions such as measurements, monitoring, etc. (depending on the option) may require the installation of an external power supply (not supplied).

control unit identification

The control unit type is identified by a series of letters and numbers on the front face as illustrated below:



ST 318 S T

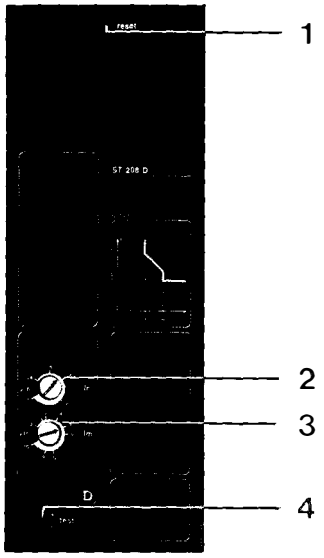
Control unit

Type of protection
D standard
S selective
U universal
L current limiting

Optional functions
T earth fault protection
R load monitoring and control (ST308, ST318, ST408, ST418)
M complementary functions (ST608)

Note
For the Masterpact unprotected circuit breaker version, the control unit is replaced by
- dummy unit ST008 for types NI and HI
- instantaneous making current release ST018 for type HF

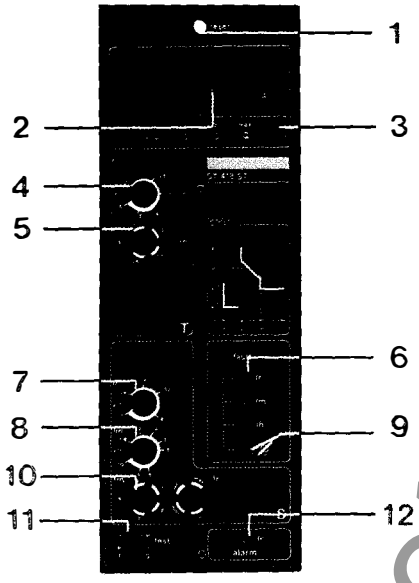
Sensor selection (In): page 8
Accessories for control units: page 22
Time / current



ST208D

1 indicator/reset button:
- indicates that a fault trip has occurred,
- prevents reclosure of air circuit breaker after fault until reset

2 long time (overload) setting adjustment
3 instantaneous (short circuit) pick-up adjustment
4 test kit connector

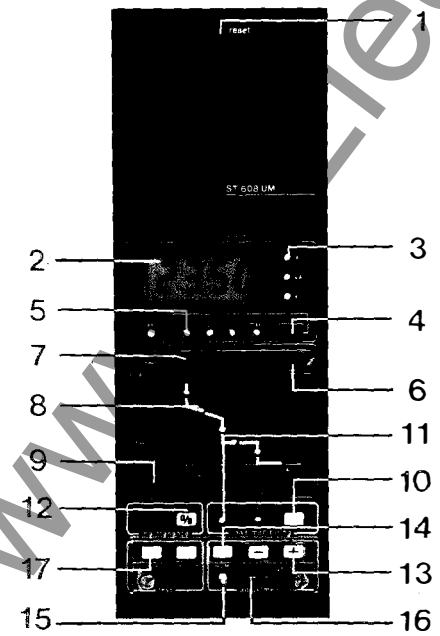


ST418ST

1 indicator/reset button:
- indicates that a fault trip has occurred,
- prevents reclosure of air circuit breaker after fault until reset

2 ammeter
3 ammeter selector, and LED's to indicate which phase is displayed
4 earth protection current pick-up adjustment (or load monitoring pick-up adjustment)
5 earth protection time delay adjustment (or load monitoring pick-up adjustment)
6 fault indicator LED's
- overload
- short circuit
- earth fault

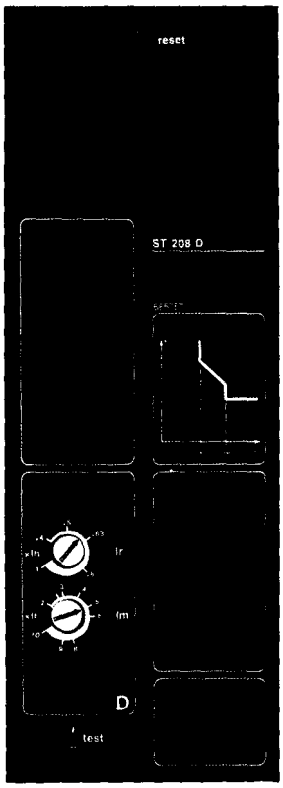
7 long time (overload) setting adjustment
8 short time (short circuit) pick-up adjustment
9 local indication clear button
10 short time delay selector
11 test kit connector
12 long time setting overrun indicator LED
13 long time delay selector



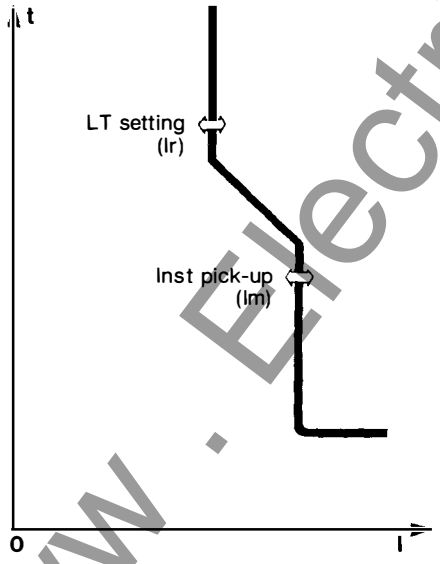
ST608UM

1 indicator/reset button:
- indicates that a fault trip has occurred,
- prevents reclosure of air circuit breaker after fault until reset

2 digital display
3 LED indicator to show range of digital display (A, kA, s)
4 ammeter display selector
5 LED showing phase being displayed
6 local fault indicator reset button
7 local fault indicator LED's
8 adjustment indicator LED's
9 selector keys for adjustments to be made or checked
10 selector keys for load monitoring pick-up settings
11 load monitoring pick-up identification LED
12 maintenance indicator key
13 digital adjustment keys and acces to complementary functions
14 validation key for the value selected using (13)
15 LED indicating validation of the value selected
16 connector for mini-battery unit (for adjustments)
17 mini-battery unit keys (adjustments, with or without breaker tripping)



ST208D : standard protection
This control unit is available on type N or H Masterpact circuit breakers. All adjustments of the protection settings are made from the front. Settings can be made tamperproof by means of a sealable transparent cover.



Control unit ST208D adjustments

protection

Control unit ST108 and ST128 provide high set **instantaneous short circuit protection** alone (high set for the ST108 and adjustable for the ST128).

Control unit ST208D provides protection against:
- **overloads,** with fixed delay long time (LT) protection;
- short circuits, with instantaneous protection.

The pick-up settings are for 1, 2, or 3 poles on load.

ammeter

An LED digital display and a measurement selection key pad are used to:
- read phase currents (I1, I2, I3)
- read the phase with the highest load current (I max)

tests

- by mini-battery unit (simplified test kit): breaker trip check
- by calibration test kit: verification of pick-up settings with tripping of breaker. Verification is based on the injection of a fault simulation current at the control unit input.

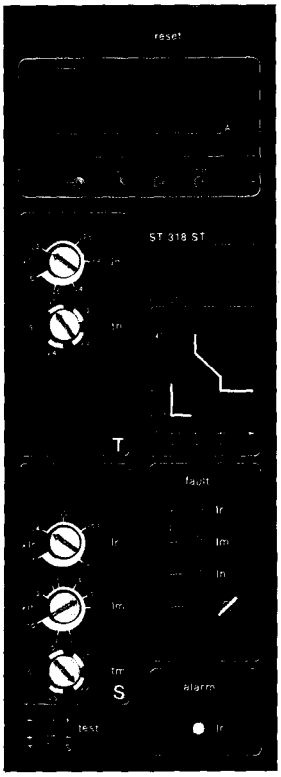
characteristics

control unit		ST108	ST128	ST208
basic functions				
long time protection LT				
current setting Ir (A)	Ir = In x...	n.a.	n.a.	0.4 to 1
	tripping			between 1.05 and 1.20 x Ir
maximum time delays (s)	at 1.5 Ir			200
instantaneous protection				
pick-up Im (A)	Im = Ir x...		2 to 10	2 to 10
pick-up Inst (A)	Inst = In x...(1)	28 for 200/800 A		
		21 for 1 000 A		
		21 for 1 250 A		
		18 for 1 600 A		
		18 for 2 000 A		
		14 for 2 500 A		
		12 for 3 200 A		
	accuracy	±20 %	±15 %	±15 %
optional functions				
ammeter (I)				
power supply AC 50/60 Hz		110/220 V - 240/440 V(2)		
display	value of	I1 - I2 - I3 - Imax		
	accuracy	±1.5 %(3)		
accessories		see page 22		

Sensor selection (In): page 8
Accessories for control units: page 22

control units

ST308S, ST308L, ST408S with instantaneous protection
ST318S, ST418S without instantaneous protection



These control units are available for Masterpact type N, H and L circuit breakers. All adjustments of protection settings are made from the front. Settings can be made tamperproof by means of a sealable transparent cover.

protection

Control units **ST308** to **ST418** provide protection against:

- **overloads,** with long time (LT) protection:
  - fixed delay for units ST308 and ST318;
  - adjustable delay for units ST408 and ST418;
- **short circuits:**
  - short time (ST) protection for units ST308/408 and ST318/418,
  - high set instantaneous (INST) protection for units ST308 and ST408;
- **earth fault protection** with time discrimination or zone selective interlocking (option Z).

Earth fault protection is of the residual current type and can be supplied with zone selective interlocking.
Source ground return protection with zone selective interlocking is also available (option W)(1).
For networks with an unswitched distributed neutral, a fourth sensor can be supplied separately.

Note : Control unit ST308L is designed for Masterpact type L1 circuit breakers. The pick-up settings are for 1, 2 or 3 poles on load.

ammeter

A LED digital display and a measurement selection key pad are used to:

- read phase currents (I1, I2, I3)
- read the phase with the highest load current (I max).

monitoring and control

- load monitoring and control option (R):

Two load limit pick-ups, adjustable as multiples of the long time delay pick-up (Ir) actuate opto-decoupled outputs. These can be used in a wide range of applications: load shedding, alarms, indications, interlocks...

- **fault indicators**

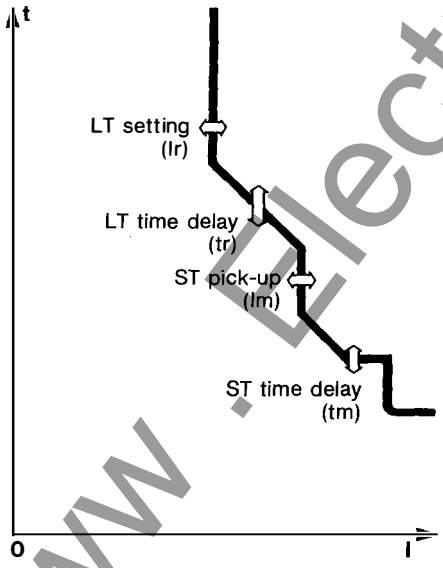
In addition to fault indication by the indicator/reset button, LT, ST/INST and earth fault (T) trips are indicated separately:
- on the breaker front by LED's (F)
- on the breaker front and remotely by opto-decoupled outputs (J).

A reset button is used to clear indicators after fault clearance.

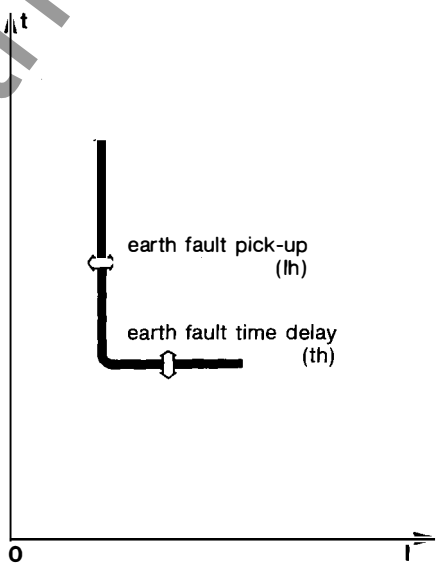
tests

- by the mini-battery unit: trip check
- by the calibration test kit: verification of protection functions with tripping of the breaker.

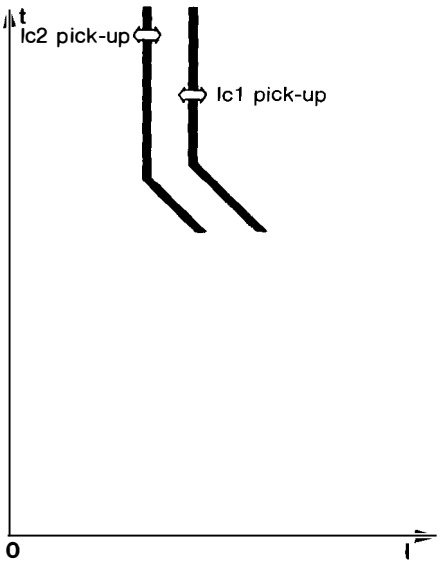
Verification is based on the injection of a fault simulation current at the control unit input.



over current protection settings



earth fault protection settings (option T)



load monitoring and control settings (option R)

characteristics

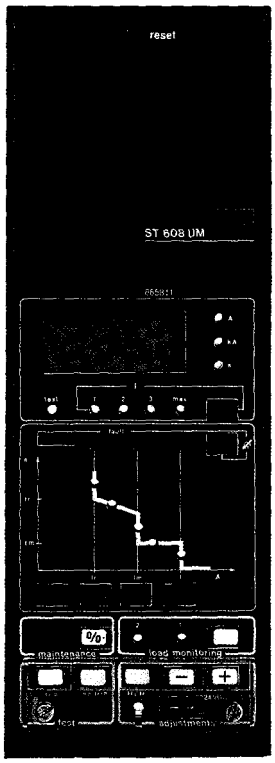
control unit		ST308S				ST408S	ST318S				ST418S	ST308L			
basic functions															
■ **long time protection LT**															
current setting Ir (A)	Ir = In x...	0.4 to 1					0.4 to 1					0.4 to 1			
	tripping	between 1.05 and 1.20 Ir					between 1.05 and 1.20 Ir					between 1.05 and 1.20 Ir			
maximum time delay (s)	tr at 1,5 Ir	fixed: 200				adjustable: 20-40-180-480	fixed: 200				adjustable: 20-40-180-480	fixed: 200			
■ **short time protection ST**															
pick-up Im (A)	Im = Ir x...	2 to 10				1.6 to 10	2 to 10				1.6 to 10	2 to 10			
	accuracy	±15 %					±15 %					±15 %			
time delay (s)	tm = band	0	0.1	0.2	0.3		0	0.1	0.2	0.3		0	0.1	0.2	0.3
maximum resettable time (ms)		0	60	140	230		0	60	140	230		0	60	140	230
maximum breaking time (ms)		30	140	230	350		30	140	230	350		30	140	230	350
■ **instantaneous protection INST**		with					without					with			
pick-up I (A)	I = In x...	28 for 200/800 A, 21 for 1 000 A, 21 for 1 250 A, 18 for 1 600 A, 18 for 2000 A,				14 for 2 500 A, 12 for 3 200 A, 11 for 4 000 A to 6 300 A.						8 from 200/800 to 1 600 A, 6 from 2 000 to 2 500 A.			
	accuracy	±20 %										±20 %			
optional functions															
■ **earth fault protection (T)**(1)		residual current type (with or without zone selective interlocking) on request: Source Ground Return type (W) with zone selective interlocking													
pick-up Ih (A)	Ih = In x...	0.2 to 0.6 for Masterpact M08 to M20 0.2 to 0.4 for Masterpact M25 to M63													
	accuracy	±15 %													
time delays (s)	th = band	0.1	0.2	0.3	0.4										
maximum resettable time (ms)		60	140	230	350										
maximum breaking time (ms)		140	230	350	500										
zone selective interlocking		on request													
■ **ammeter (I)**															
power CA 50/60 Hz		110/220 V-240/440 V(3)(4)													
maximum consumption (VA)		100													
display	value of	I1-I2-I3-Imax													
	accuracy	±1.5 %(2)													
■ **load monitoring (R)**(1)(4)(5)															
load limit 1 (A)	Ic1 = Ir x...	0.8 to 1													
	accuracy	±5 %													
maximum time delay, fixed (s)	tr1 at 1.5 Ic1	10													
	remote output	opto-decoupled (1A triac type), 24 to 240 V AC(4)													
load limit Ic2 (A)	Ic2 = Ir x...	0.8 to 1													
	accuracy	±5 %													
maximum time delay, fixed (s)	tr2 at 1.5 Ic2	5													
	remote output	opto-decoupled (1A triac type), 24 to 240 V AC(4)													
■ **fault indicators**		as standard with options (T) and (R)													
front face LEDs (F)		Ir pick-up overrun and Ir-Im/I-Ih tripping													
power		24 to 240 V AC ±15 % - other voltage via module AD 24 to 125 V DC ±20 % - other voltage via module AD													
front face LEDs and remote output (J)(5)(7)		Ir(6) pick-up overrun and Ir-Im/I-Ih tripping by opto-decoupled outputs (1 A triac type), 24 to 240 V AC or DC													
power		other voltages via modules AD													
accessories		see page 22													

(1) Options T and R cannot be combined.
(2) Overall measurement accuracy is ±4.5 %.

Sensor selection (In): page 8
Accessories for control units: page 22

control units
ST608U/UM/UTM

microprocessor based universal protection RMS



Control unit ST608U is available for Masterpact type H and type L1 circuit breakers.
Microprogramming technology provides greater adjustment and operating flexibility, extending its use to measurement, automatic control and energy management functions.
This control unit is equipped with a keyboard, a liquid crystal display and indicator LED's enabling adjustment, modification and display of the time and current parameters for the various functions. A sealable cover can be used to block access to adjustment keys.
Control unit ST608U is equipped with a thermal memory that integrates occasional current peaks to produce a thermal image of the device to be protected.
This thermal memory can be disabled by the user. It is subject to a time delay of:
- 30 minutes for long time (LT) tripping,
- 10 minutes for short time tripping,
- 1 minute for earth fault protection.

Versions
Two other versions of the basic ST608U control unit are available
- **ST608UM** including:
  - the basic ST608U functions,
  - option M.
- **ST608UTM** including:
  - the basic ST608U functions,
  - earth fault protection,
  - option M.

Note: The minimum current rating In for the ST608U control unit is 400 A.

protection

The ST608U series provides protection against:
- **overloads** by long time (LT) protection with adjustable delay;
- **short circuits:**
  - short-time (ST) protection for which the I^2t type time/current curve may be disabled by the user
  - instantaneous (INST) protection
- **earth fault protection** is of the residual current type with time discrimination or zone selective interlocking (if the option M function is implemented).

Source Ground Return protection with zone selective interlocking is also available(1).
The pick-up settings are for 1, 2 or 3 poles on load.
For networks with an unswitched distributed neutral, a fourth sensor can be supplied separately.

ammeter

A LED digital display and a measurement selection key pad are used to:
- read phase currents (I1, I2, I3)
- read the phase with the highest load current (I max).

monitoring and control

- **load monitoring and control (option M)**

Two adjustable load limits (based on multiples of rated current In) actuating opto-decoupled outputs (transistors) can be used in applications such as load shedding and reconnection, interlocks, indication, alarms...
Ic1 = maximum load setting (load shedding)
Ic2 = maximum load setting (load shedding) or load reconnecting setting.

fault indicators

In addition to fault indications by the indicator/reset button, LT, ST/INST and earth fault (T) trips are indicated separately:
- locally by LED's (standard)
- remotely (option M) by opto-decoupled outputs (transistors).

maintenance indicator

Based upon a calculation made from the number and size of the currents interrupted and the number of breaker operations, the indicator displays a number, between 0 and 655.
The main contacts should be inspected when the indicator reaches 100, 200, etc.
This information can be transmitted to an external device as part of option M.

self-monitoring

This function signals to following anomalies:
- overtemperature
- control unit malfunction

These conditions are indicated:
- on the display by the message "Err"
- remotely (option M) by an opto-decoupled output.

As standard, this function provides indications only, maximizing service continuity.
On request, self-monitoring alarm conditions can trip the circuit breaker.

data transmission

Option M includes the possibility of transmitting the following information on a 20 mA current loop:
- transmission rate: 300 bauds.
- current values I1, I2, I3 and I max
- LT, ST/INST, earth fault (T), Ic1 and Ic2 settings
- breaker status (open or closed)
- differentiated fault indications
- value of fault current
- pick-up overrun (real or simulated)
- thermal memory status
- "test" position
- Ic1 ou Ic2 output states (load monitoring and control)
- self-monitoring output states
- maintenance indication.

See document no. 688 191 (available on request)

tests

Incorporated in the unit, this function is designed to check:
- protection and load monitoring curves,
- local and remote differentiated indicators.

This can be performed with or without the breaker tripping, depending on the key selected.
Note: if the breaker is left in operation during testing, the protection functions remain operational and have priority.

power supply

The protection functions are self-powered and require no auxiliary supply.
Fault memory, display and indication functions require power supply as follows:
- direct power supply for 110, 220 or 380 V AC
- power supply with input/output isolation via a power supply module (see p. 22) for 24/30, 48/60 or 125 V DC.

Sensor selection (In): page 8
Accessories for control units: page 22
Time / current

characteristics

basic functions		ST608U				
■ long time protection LT						
current setting Ir (A)	Ir = In x...	0.4 to 1 (in 2 % steps, 160 A minimum)				
	tripping	between 1.05 and 1.20 Ir				
maximum time delay (s)	tr at 1.5 Ir	adjustable: 15-30-60-120-240-480				
	accuracy	+0 −20 %				
■ short time protection ST						
pick-up Im (A)	Im = In x...	0.4 to 15 (in 4 % steps)				
	accuracy	± 10 %				
time delay (s)	tm = band	0.1	0.2	0.3	0.4	
maximum resettable time (ms)		60	140	230	350	
maximum breaking time (ms)		140	230	350	500	
■ instantaneous protection INST						
fixed pick-up I (A)	I = (kA)	50 for M08 to M16 - 65 for M20 to M32 75 for M40 to M63(1)				
	accuracy	± 15 %				
adjustable pick-up I		I from In to fixed pick-up (in 8 % steps, 1.6 kA minimum)				
	accuracy	± 15 %				
■ ammeter (I)						
power		self-powered				
display	value of	I1-I2-I3-I max				
	accuracy	± 1.5 %(2)				
■ indicators and memory						
front face LEDs		Ir-Im-I-Ih tripping				
display		fault current value				
power (AC 50/60 Hz)		110 V-220 V-380 V(4)				
■ maintenance indicator						
display		between 0 and 655				
■ self-monitoring						
display		'Err' message				
■ test		integral				
optional functions						
■ earth fault protection (T)(3)		residual current type (with or without zone selective interlocking) on request: Source Ground Return type (W) with zone selective interlocking				
pick-up Ih (A)	Ih = In x...	0.2 to 1 (In 2 % steps, 1 200 A max, 160 A min)				
	accuracy	± 10 %				
time delay (s)	th = band	0.1	0.2	0.3	0.4	
maximum resettable time (ms)		60	140	230	350	
maximum breaking time (ms)		140	230	350	500	
zone selective interlocking		see option M				
■ option M (see possibilities p. 20)		m01 to m16		m17 to m32 with data transmission		
data transmission				20 mA current loop (JBUS protocol) 300 bauds		
number of devices connectable				255		
power		via module AD				
opto-decoupled outputs		6 × 0.2 A-24 VDC(3)	2 × 0.2 A-24 VDC(3)			
□ load monitoring and control (R)		(2 possibilities)				
— 2 load limit settings	setting 1 (A) Ic1 = In x...	0.2 to 1 in 2 % steps				
	tr1 = tr x...	0.5				
	setting 2 (A) Ic2 = In x...	0.2 to 1 in 2 % steps				
	tr2 = tr x...	0.25				
— 1 load limit setting and 1 load reconnection setting	setting 1 (A) Ic1 = In x...	0.2 to 1 in 2 % steps				
	tr1 = tr x...	0.5				
	setting 2 (A) Ic2 = In x...	0.2 to 1 in 2 % steps				
	tr2	60 s (fixed)				
	accuracy	± 5 %				
□ fault indicators		remote outputs for Ir, Im/I, Ih tripping				
□ self-monitoring		remote outputs				
□ zone selective interlocking		for earth fault protection				
□ other transmission possibilities						
adjustment parameters				current pick-ups and delay settings		

(1) 50 for the 4P version.
(2) Overall measurement accuracy is ± 3 %.

option M selection

Option M can be incorporated in control unit ST608U to provide the following functions:
- data transmission on a 20 mA current loop using JBUS protocol (with up to 255 devices on the loop);
- remoting via opto-electronic outputs;
- zone selective interlocking on the earth fault protection.

The following table indicates the functions of the different versions, designated m01 to m32.
For terminal wiring see page 66.

without data transmission

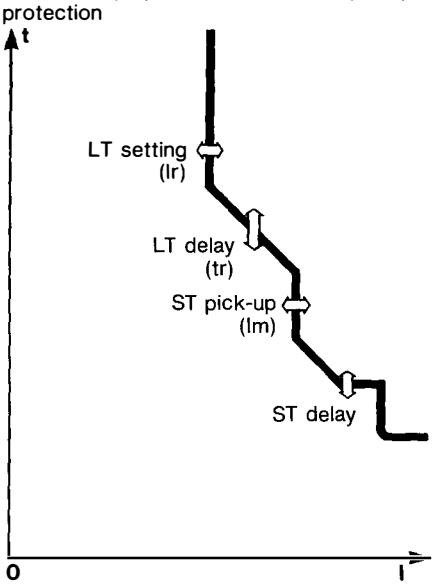
option		m01	m02	m03	m04	m05	m06	m07	m08	m09	m10	m11	m12	m13	m14	m15	m16
data transmission																	
all parameters (see p. 18)																	
remoting																	
load monitoring and control																	
pick-up Ic1	indication		■	■	■	■	■	■	■		■	■		■	■		
	load shedding		■	■	■	■	■	■		■	■	■	■	■	■	■	
pick-up Ic2	indication		■	■		■						■					
	load shedding		■		■	■		■		■	■	■		■	■		
	load reconnection			■			■						■			■	
fault indications																	
Ir		■	■	■	■		■	■	■	■	■		■				
Im/I		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
Ih								■	■	■	■	■	■	■	■	■	
self-monitoring		■			■	■	■		■	■				■		■	
zone selective interlocking																	
on the earth fault protection									■		■		■		■	■	

with data transmission

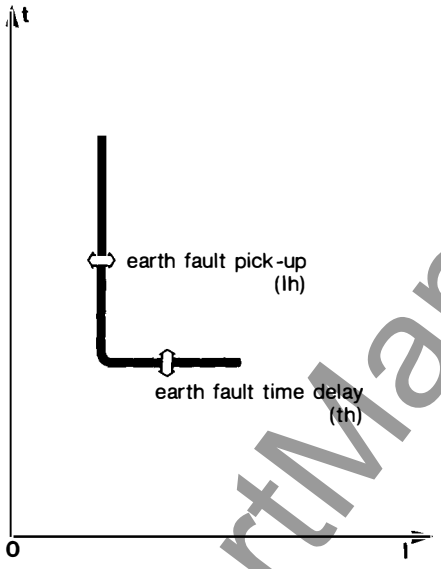
option		m17	m18	m19	m20	m21	m22	m23	m24	m25	m26	m27	m28	m29	m30	m31	m32
data transmission																	
all parameters (see p. 18)		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
remoting																	
load monitoring and control																	
pick-up Ic1	indication							■			■		■				
	load shedding								■	■		■		■	■	■	
pick-up Ic2	indication												■				
	load shedding													■			
	load reconnection														■		
fault indications																	
Ir		■															
Im/I		■	■	■							■	■					
Ih				■	■	■				■							
self-monitoring			■		■		■									■	
zone selective interlocking																	
on the earth fault protection						■	■	■	■								

operating zones

Basic functions : long time (LT), short time (ST) and instantaneous (INST) protection



Earth fault protection (option T)



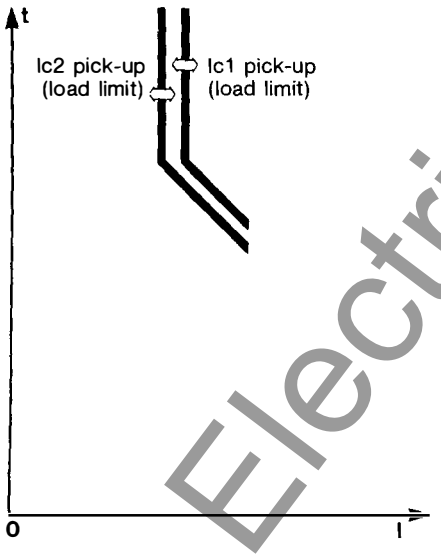
Factory adjustments

The ST608U control unit is factory adjusted as follows :

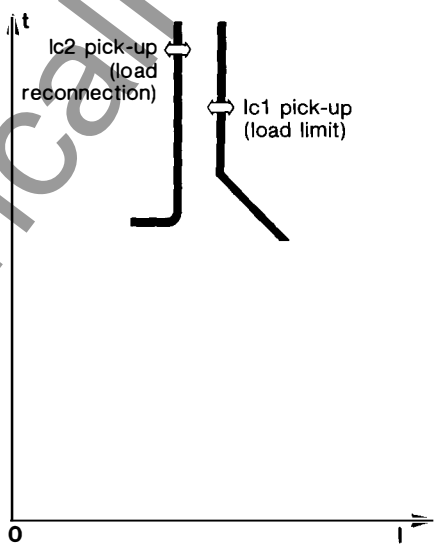
LT	setting Ir		In
	time delay tr		480 s
ST	pick-up Im		4 In
	time delay tm		0.2 s
INST	pick-up I		max
T	earth fault pick-up Ih		0.2 In
	time delay th		0.1 s
	load monitor	Ic1	In
		Ic2	In

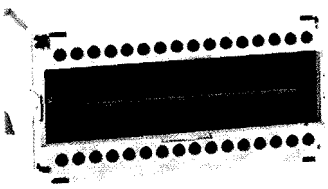
load monitoring and control (option M)

Operation with 2 load limit pick-ups



Operation with 1 load limit and 1 load reconnection pick-up



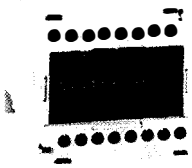


relay module (MR6)

For relaying of information from outputs of modules m01 to m32 of control unit ST608UM via output changeover contacts 10 A/220 V AC or 3 A/24 V DC.

Power supply module (AD) required.

Both these modules fit on the optional support accessory (ABM).



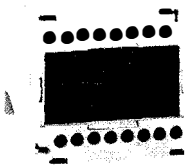
power supply module (AD)

This module offers alternative power supply voltages for
- ST308: indications,
- ST608: fault current memory, indications, measurements, maintenance indicator,
- module MR6.

When the auxiliary source is DC, this module protects the control unit by providing output/input isolation.

Voltages available:
- AC 50/60 Hz: 110 V, 220 V or 380 V(1) (consumption 10 VA)
- DC: 24/30 V, 48/60 V, 125 V(2) (consumption 10 W)

This module fits on the optional support accessory (ABM).

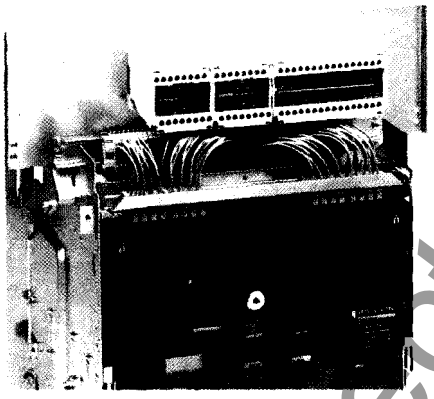


battery module (BAT)(3)

Providing a complement to module AD, the battery module safeguards display, indication and maintenance indicator data in the event of a power failure.
Float connected between the power supply and the control unit, it ensures a data safeguard period of approximately:

- 12 h for control units ST308/318 and ST408/418,
- 1.5 h for control unit ST608.

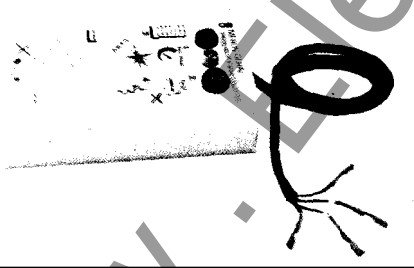
This module fits on the optional support accessory (ABM).



support accessory (ABM)

Equipped with all holes necessary for mounting and fixing modules MR6, AD and BAT and filter units for options R and J.
Fitting location:
- on top part of fixed frame for drawout breakers;
- near the breaker for fixed versions.

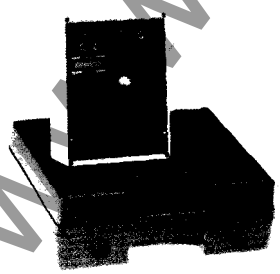
Note: suitable for Masterpact M08 to M32. Incompatible with terminal shield CB, arc chute cover CC and auxiliary switch block OFSUP.



mini battery unit (simplified test kit) (BU)

This self-contained portable unit is used:
- for control unit ST608, to power, check and carry out adjustments and tests on the breaker/control unit assembly;
- for other control units, to check control unit operation and breaker tripping.

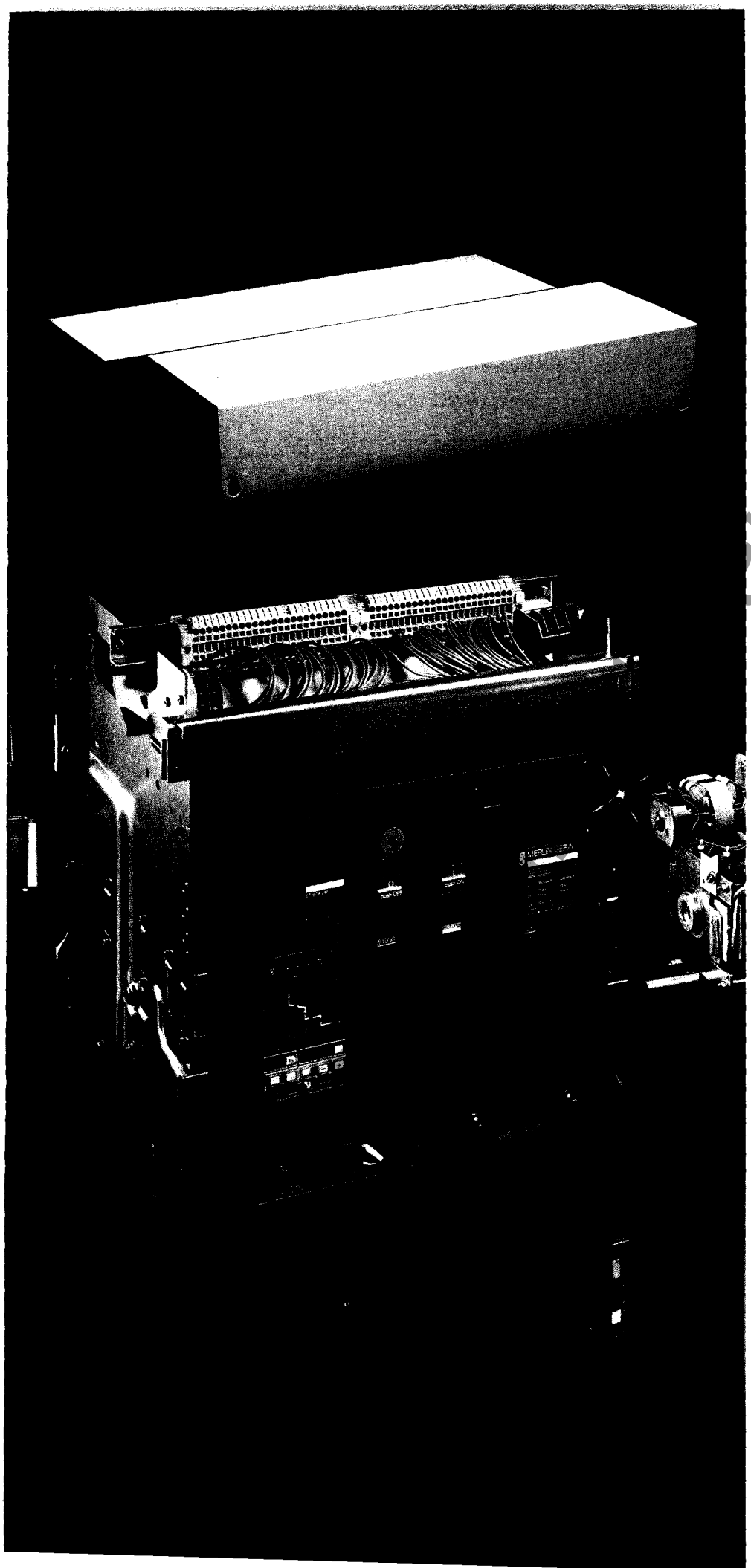
Power supply: five 9 V alkaline batteries (not supplied)



calibration test kit (ME)

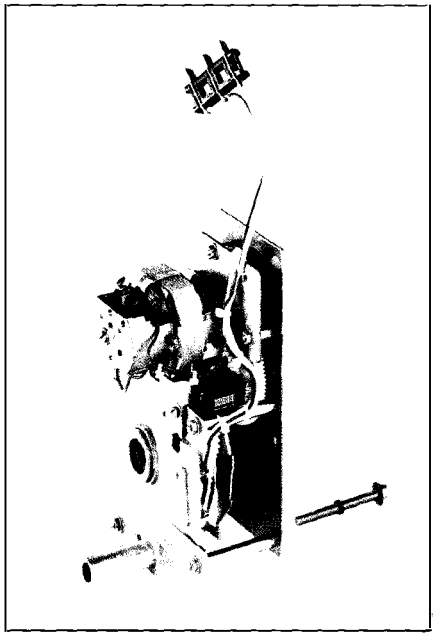
Used to check operating points for the various protection functions and actual breaking time:
- long time protection: to check that tripping occurs at 1.5 Ir;
- short time protection: to check that tripping occurs at 15 In;
- earth fault protection: to check that tripping occurs at 0.8 In.

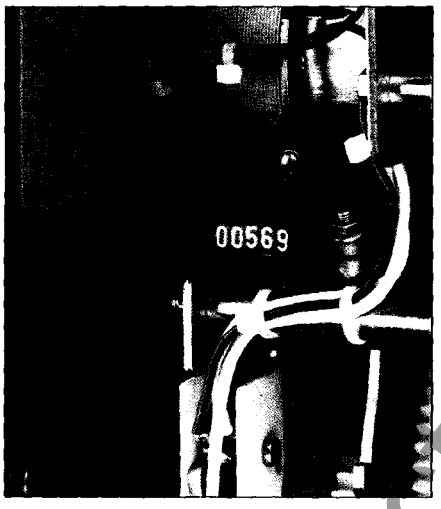
Power supply: 110, 220 V AC 50/60 Hz.



Masterpact LV air circuit breaker

electrical auxiliaries and mechanical accessories





electrical operating mechanism

Added to the manual charging mechanism, a motor charges and automatically recharges the stored energy spring upon breaker closing making possible fast O-C-O cycles.
Opening and closing operations are instantaneous.
The manual mechanism remains available for emergency use.

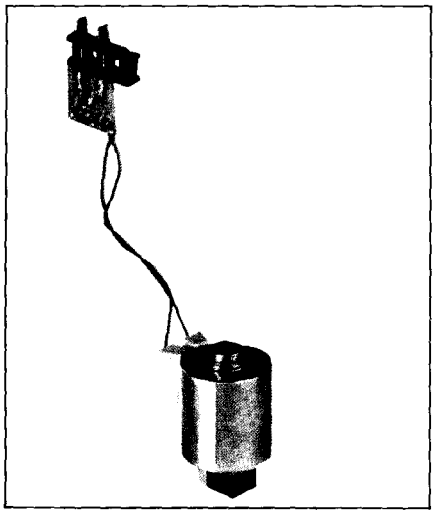
The electrical operating mechanism includes:
- the gear motor (MCH),
- a closing release (XF),
- a shunt release (MX) or an undervoltage release (MN) for opening,
- « springs charged » limit switch changeover contact (CH).

The addition of the electrical operating mechanism does not alter circuit breaker dimensions.

characteristics		geared motor (MCH)
power supply 50/60 Hz (V)		100/127 - 200/240 - 250/277 - 380 - 415 440 - 480
	consumption (VA)	180
	DC (V)	24/30 - 48/60 - 100/125 - 200/250
	consumption (W)	180
motor start-up surge		2 to 3 × In for 0.1 s
charging time		3 to 4 s

operation counter (CDM)

With gear motor option only. The operation counter is read from the front and gives the total number of breaker operating cycles.



releases

■ **voltage releases**
Two types of voltage release can be used for remote opening of Masterpact circuit breakers:

■ **undervoltage releases**

□ **instantaneous (MN)**
This release instantaneously opens the breaker when its supply voltage drops below a value between 35 % and 70 % of its rated voltage.
If the release is not energised, the breaker cannot be closed (either manually of electrically). Any attempt to close will have no effect on the main contacts.
Closing is possible when the release voltage reaches 85 % of its rated value.

□ **time delayed (MNR)**
To prevent the breaker tripping in the event of the transient voltage dips, this release has a built-in time delay.
A special version, available on request, allows instantaneous tripping (from a mushroom head emergency off button) by the wiring of an external contact.

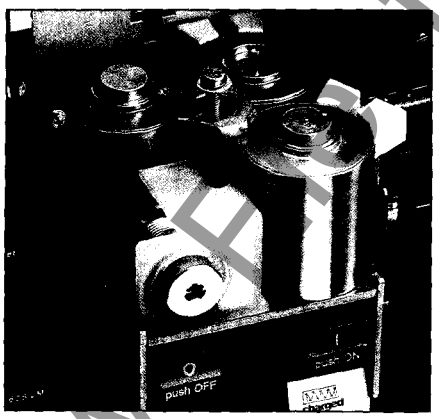
■ **shunt release (MX)**
This release instantaneously opens the breaker when energised. The supply can be maintained or automatically disconnected. In the latter case, the user can series connect an internal auxiliary contact (OF).

closing release (XF)

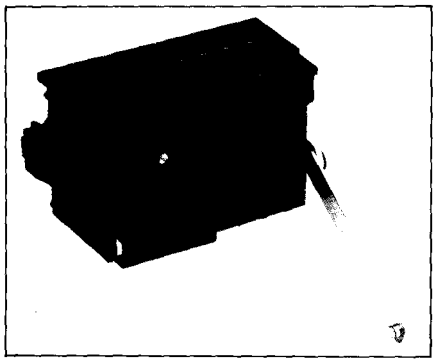
This device releases the breaker closing mechanism when the spring is charged. Energisation can be maintained, as the closing release provides an antipumping function.

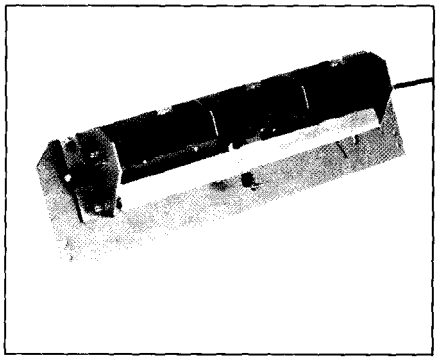
Note: anti-pumping function:
After the breaker has been opened, either by fault trip or by manual or electrical operation, anti-pumping is provided by requiring cancellation of the initial closing command before reclosure of the breaker is possible.
The closing release is supplied on request with the manual operating mechanism.

characteristics	voltage release		shunt	closing release
	MN	MNR	MX	XF
breaker response time at Un	90 ms ± 5	0.5 s-0.9 s 1.5 s-3 s	40 ms ±5	60 ms ±5
operating thresholds				
opening:	0.35 to 0.7 Un		0.7 to 1.1 Un	
closing:	0.85 Un			0.85 to 1.1 Un
power supply(1)				
AC 50/60 Hz (V)	100-110/127-200-220/250-277-380/415-440/480 500/525(2) - 600(2)			
consumption (VA)	20			
DC (V)	24 - 30 - 48 - 60 - 100/110 - 125 - 200/220 - 250			
consumption (W)	15			



Release combinations
Each Masterpact circuit breaker can be equipped with:
1 MX + 1 MN + 1 XF, or
2 MX's + 1 XF





auxiliary switches

In addition to the main contact indication on the front, 3 auxiliary switch blocks are available to indicate the open and closed breaker positions.

- **standard: 4 contacts (O)** (2 normally open 2 normally closed).
- **optional: 4 directly-operated double break changeover switches (OF)** which operate only when the minimum isolating distance between the main contacts is reached.
- **optional: 24 additional changeover switches (OFSUP block).** These microswitches can be parallel connected in pairs to increase the rated current and breaking capacity.

« ready to close » contact (PF)

Optional:
This contact simultaneously indicates the following:

- the breaker is open
- the stored energy mechanism is charged
- the mechanism is correctly reset
- the breaker opening pushbutton is not locked
- no opening order is present.

This contact can be series connected to the closing release (XF) to disable the anti-pumping function.

« spring charged » contact (CH)

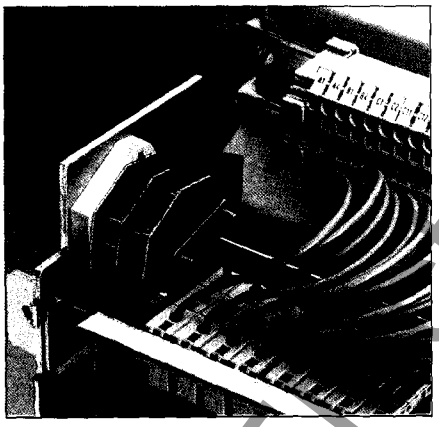
In addition to the local mechanical indicator and the « ready to close » contact, the gear motor limit switch changeover contact can indicate that the operating mechanism is ready (spring charged).

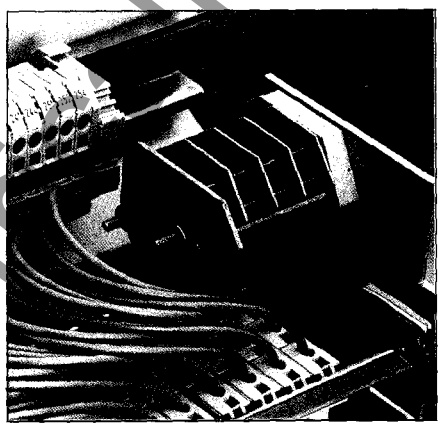
fault trip indication (SDE)

As standard and independent from the differentiated fault indications on the control unit any fault trip is indicated by:

- 1 fault trip indicator/reset button,
- 1 changeover contact (SDE).

The reset button must always be pressed after a fault trip to enable breaker closing.
Optional: Automatic reset, allowing remote breaker closing without requiring local fault trip reset via the reset button and the SDE contact.





connected/disconnected position carriage switches

In addition to the local « connected/test/disconnected » position indicator, two series of **optional** carriage switches are available for the fixed chassis (of drawout circuit breaker).

- **a block of 4 changeover switches** to indicate « connected » position (CE)
- **a block of 2 changeover switches** to indicate « disconnected » position (CD).

The disconnected position is indicated only when the minimum isolating distance between main and auxiliary circuits has been reached.
By series connection of these contacts the test position can be indicated.

- **1 changeover switch** to indicate « test » position (CT).

contact characteristics

auxiliary contacts	type	O	OF	OFSUP	SDE	PF	CE	CD	CT	CH
quantity	changeover		4	24	1	1	4	2	1	1
	NO	2 NO								
	NC	2 NC								
current rating (A)		10	10	10	10	10	10	10	10	10
breaking capacity	110 V		15							
AC 50/60 Hz (A rms.)	240 V	10	10	10	10	10	10	10	10	10
pf ⩾ 0.3	380 V	6	10	6	5	5	6	6	6	6
	480 V	6	10	6			6	6	6	6
	600 V	3	6	3			3	3	3	3
DC (A)	48 V	3	5	3	3	3	3	3	3	3
L/R ⩽ 0.01 s	125 V	0.5	3	0.5	0.3	0.3	0.5	0.5	0.5	0.5
	250 V	0.25	3	0.25	0.15	0.15	0.25	0.25	0.25	0.25
	500 V		0.5							

pushbutton locking device

Optional: This padlockable device (padlocks not supplied) prevents direct operation of the circuit breaker by covering the « on » and « off » pushbuttons. This locking device can also be used for lead sealing.

« off » position lock

Optional: A Profalux key lock locks the breaker in « off » position by holding the pushbutton in its depressed position.

pushbutton locking device

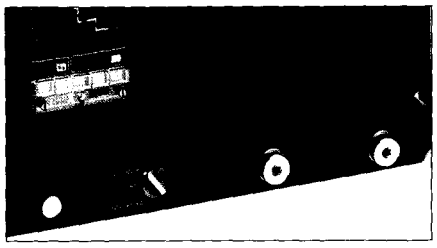
by padlocks (not supplied)	**VBP**

« off » position locking device(1)

1 Profalux key lock	**VSPA1**
2 Profalux key locks, identical profiles	**VSPA2**
adaptation fixture for 1 Profalux key lock, lock not supplied	**VSPAC**

On request:

1 Ronis key lock	**VSRA1**
2 Ronis key locks, identical profiles	**VSRA2**
adaptation fixture for 1 Ronis key lock, lock not supplied	**VSRAC**
adaptation fixture for 1 Castell key lock, lock not supplied	**VSCA**
adaptation fixture for 1 Kirk key lock, lock not supplied	**VSRKA**



« disconnected », « connected » and « test » position locking(1)

Mounted on the frame and accessible with the cubicle door locked, this system is available in two versions:
- ■ « disconnected » position locking
  - □ as standard by 1 padlocking device (1 to 3 padlocks not supplied)
  - □ **optional:** by a locking device with 1 or 2 Profalux key locks;
- ■ « disconnected », « connected » and « test » position locking (optional)
  - □ by 1 padlocking device, with 1 to 3 padlocks not supplied (VEC);
  - □ by a locking device with 1 or 2 Profalux key locks (VSPEC)

Remarks
- ■ the keylocks are of the captive key type, i.e. key free when locked;
- ■ Profalux and Ronis keylocks can be used together;
- ■ a second Profalux or Ronis lock, identical to the one mounted on the frame, can be supplied separately.

padlocks	1 keylock	2 keylocks
« disconnected » (standard)		
« disconnected » (standard)	« disconnected » (optional)	
« disconnected » (standard)	« disconnected » (optional)	« disconnected » (optional)
« disconnected, connected »		
« disconnected, connected »	« disconnected, connected »	
« disconnected, connected »	« disconnected, connected »	« disconnected, connected »

« disconnected » position locking

by padlocks (not supplied)	as standard
1 Profalux key lock	**VSPC1**
2 Profalux key locks, identical profiles	**VSPC2**
2 Profalux key locks, different profiles	2 **VSPC1**
adaptation fixture for Profalux key lock (lock not supplied)	**VSPCC**

On request:

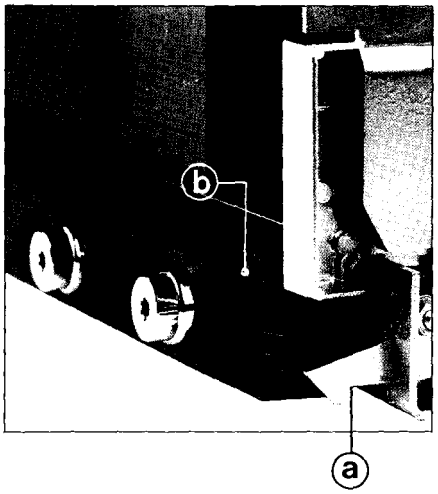
1 Ronis key lock	**VSRC1**
2 Ronis key locks, identical profiles	**VSRC2**
2 Ronis key locks, different profiles	2 **VSRC1**
adaptation fixture for Profalux key lock (lock not supplied)	**VSRCC**
adaptation fixture for Castell key lock (lock not supplied)	**VSCC**
adaptation fixture for Kirk key lock (lock not supplied)	**VSKC**
adaptation fixture for Trayvou key lock (lock not supplied)	**VSTC**

« disconnected », « connected » and « test » position locking

by padlocks (not supplied)	**VEC**
1 Profalux key lock	**VSEPC**
2 Profalux key locks, different profiles	2 **VSEPC**

On request:

1 Ronis key lock	**VSERC**



a door latch
b racking interlock

door interlock

Optional: Mounted on the frame, this lock prevents the cubicle door from being opened when the breaker is in the « connected ›› position. If the breaker is put into the « connected » position with the door open, the latter can be closed without disconnecting the breaker.

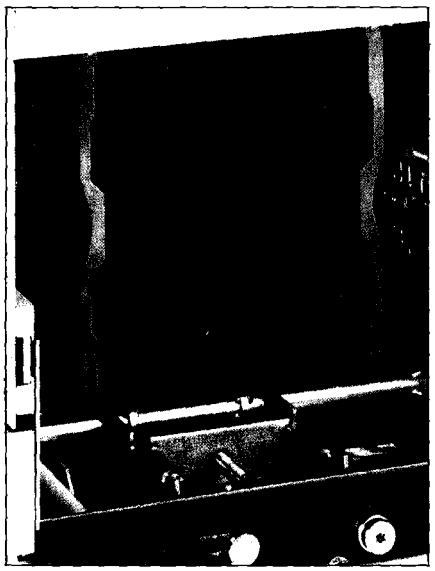
racking interlock

Optional: This lock prevents insertion of the breaker racking handle when the cubicle door is open. It can be defeated by pressing on the unlocking mechanism.

withdrawal/spring charged interlock

Optional: This lock prevents withdrawal of the breaker from the frame when the springs are charged.
Incompatible with MN or MNR release.

door interlock	
right-hand lock	**VPECD**
left-hand lock	**VPECG**
racking interlock	
preventing racking with door open	**VPOC**
withdrawal/spring charged interlock	
	VEAA



safety shutters (VO)

Optional: Mounted on the fixed portion of drawout breakers, the safety shutters automatically block access to the disconnecting contacts when the breaker is in the disconnected or test position (degree of protection IP20).

shutter lock (VVC)

Optional: Mounted on the fixed portion of drawout breakers, a mobile and lockable slide (padlocks not supplied) is used to:
- lock the shutters in the closed position,
- hold the shutters in the open position.

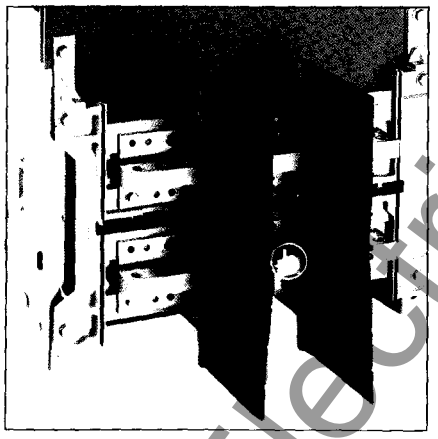
A support is provided at the back of the frame to hold the slide when not in use.
A second slide may be ordered.

arc chute cover (CC)

Optional: Attached to the fixed portion of drawout circuit breakers, this cover eliminates the safety clearance requirement above the breaker (this option is incompatible with front connections on top).

terminal shield (CB)

Optional: Attached to the fixed portion of drawout circuit breakers, this cover prevents access to the electrical auxiliary connection terminals. This option is incompatible with support accessory ABM (see p. 22).



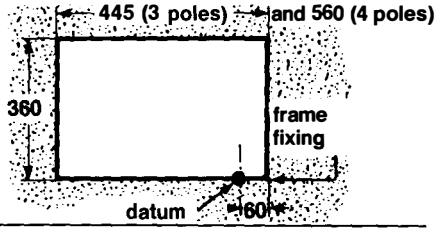
interphase barrier (EIP)

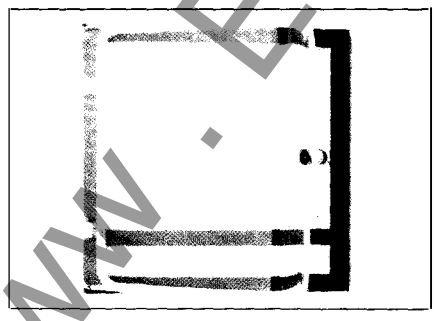
Optional: Insulated partitions for vertical installation between connection pads to:
- reinforce insulation at connection points in insulated busbar installations;
- prevent arc propagation to the breaker in the event of a line side fault on the main busbars.

a: partitioning fixture (AC)
b: interphase barrier (EIP)

partitioning fixture (AC)

Optional: Attached to the fixed portion of drawout breakers (except when equipped with front connections), this fixture provides IP30 partitioning between the breaker compartment (accessible from the front) and the connection zone (located in the rear). It simplifies partition cut-outs.
Example of partition cut-out for Masterpact M08 to M32.





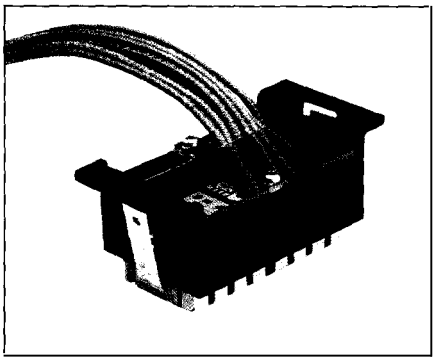
door frame (CDP)

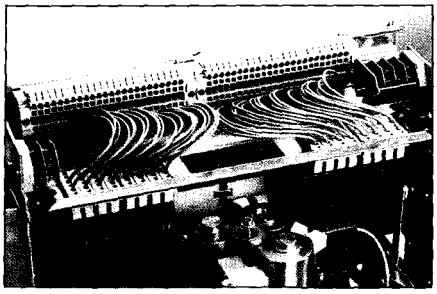
Optional: Fixed to the cublicle door, this frame provides an equipment seal function (degree of protection IP405).
Suitable for fixed and drawout patterns.

transparent cover (CCP)

Optional: Hinge-mounted and equipped with a screw-closure, this cover is designed for the door frame (CDP). It provides a degree of protection of IP549.
Suitable for fixed and drawout patterns.

Earth connection
The earth connection (drawout pattern) is on the left hand side of the frame. It is marked with the symbol ⏚



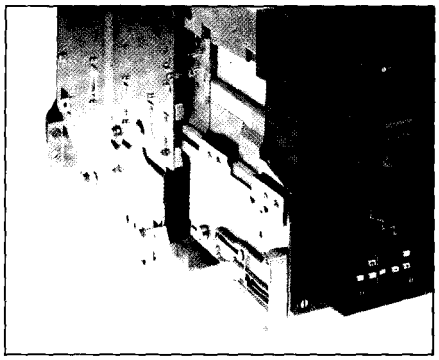


auxiliaries connection

Fixed version
Connection by one or two plugs, disconnectable and accessible from the front (screwless tunnel terminals for flex cable up to 2.5 mm²).

Drawout version
■ **standard :** connection to a terminal block in the front of the fixed frame (screwless tunnel terminals for flex cable up to 2.5 mm²).
The breaker auxiliary circuits are connected by connection blocks that operate automatically to isolate the auxiliaries when the breaker is in « disconnected » position.
■ **optional :** by one or two plugs, disconnectable and accessible frome the front, installed on the mobile part of the assembly.

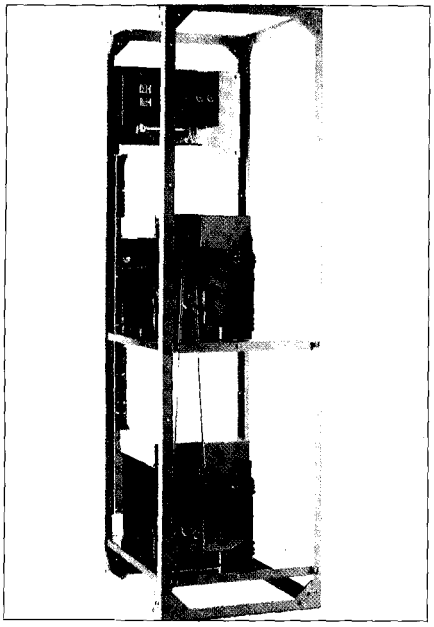
« connected/disconnected/test » position contacts
Installed on the fixed frame, these contacts are directly connected by 6.35 mm connectors.
On request, an additional 5-way terminal block (BS) is available to provide five common points.



breaker mismatch protection

Optional: for drawout version only, this system allows only correctly matched breakers (rating, type, wiring, etc.) to be inserted in a given fixed frame.
Two matching parts (1 for the fixed frame and 1 for the mobile assembly) can be used to create 20 different user-selected combinations.

automatic source changeover system



Masterpact automatic source changeover system mounted on a frame

functions

The Masterpact automatic source changeover system handles the switching between a « normal » source (N) and a « standby » source (S) which can be either of the following:

- a permanent standby source (another mains incomer, independant generator set with a built-in starter relay, etc.);
- an off-line generator set started and stopped by the automatic controller.

parts

Masterpact automatic source changeover systems are made up of:

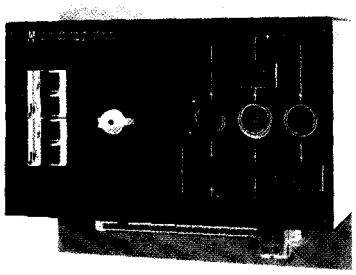
- 2 Masterpact (protected or unprotected circuit breakers);
- 1 mechanical interlocking system;
- 1 automatic controller.

Each Masterpact is equipped with:

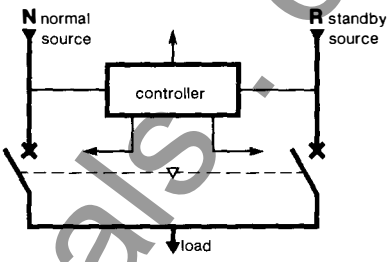
- an electrical operating mechanism;
- a shunt release (MX);
- a « ready to close » contact (PF);
- a block of 4 changeover switches (OF);
- an additional terminal block (BS) and a block of 4 « connected » position switches (CE) for changeover systems including drawout breakers.

assembly and installation

The various parts of the Masterpact automatic source changeover system are mounted and connected by the user. No circuit breaker modifications are required.
The connection diagrams are shown on pages 69 to 72.
The Masterpact automatic source changeover system may also be supplied factory wired and mounted on a metal frame.



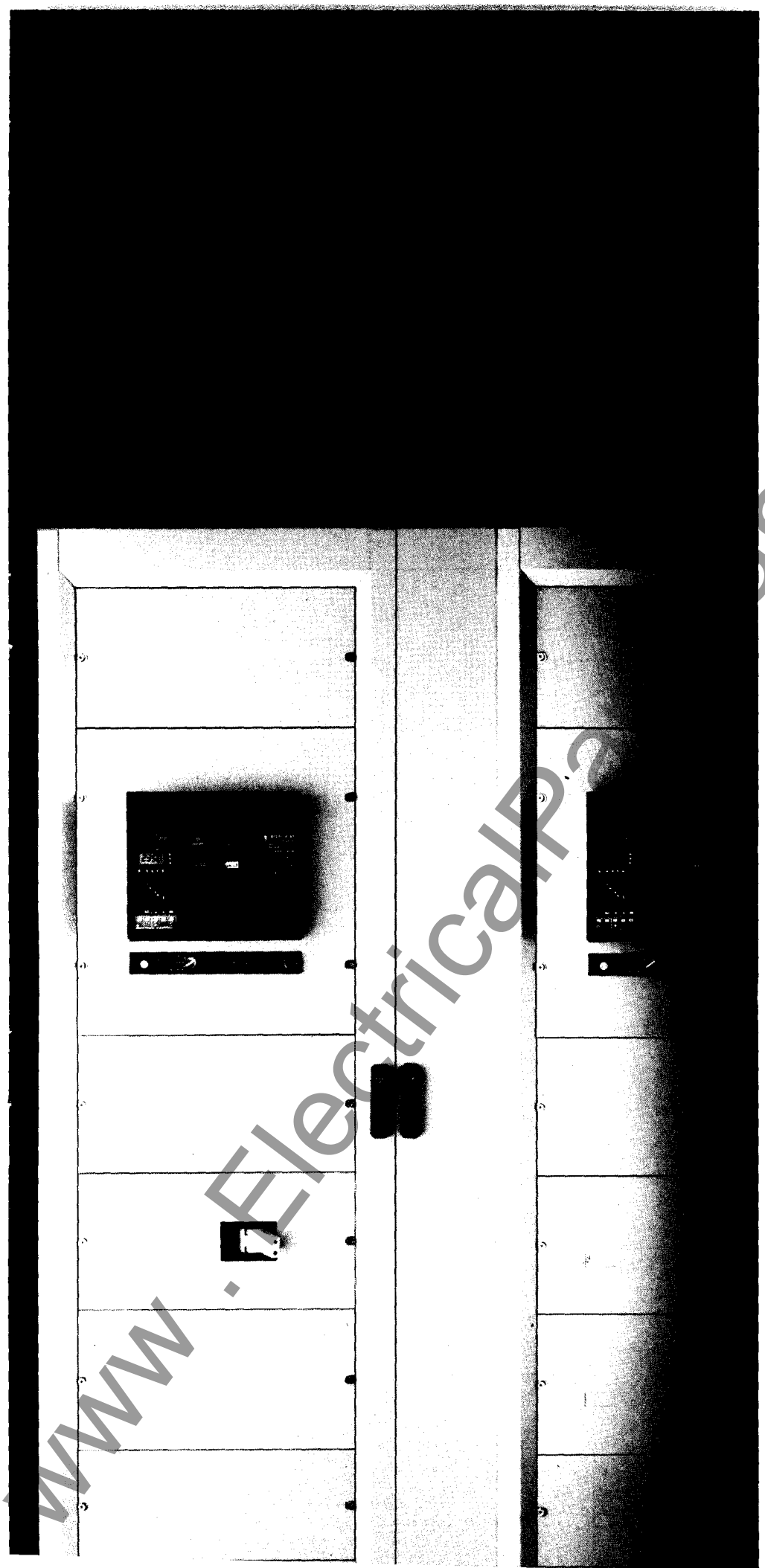
Automatic controller



automatic operation

The automatic transfers are detailed on pages 69 to 72.
The automatic controller is equipped with a switch to preselect the operating mode (automatic, off, forced operation on normal source, forced operation on standby source).
The controller operates on its own voltage; no auxiliary source is required.
The circuit breaker can if necessary still be tripped either manually or by a voltage release (MX).
The following special functions may be wired in by the user (consult us):

- voltage test on all 4 phases;
- voluntary transfer controlled by an electric signal;
- operating check;
- selection of the source to be considered « Normal » via a switch.

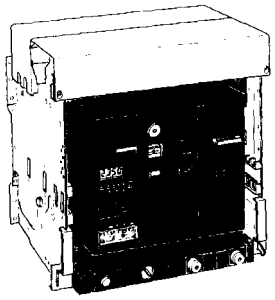


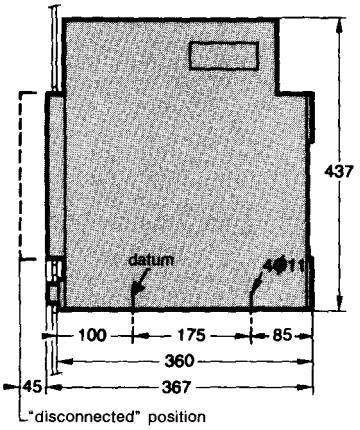
Masterpact LV air circuit breaker

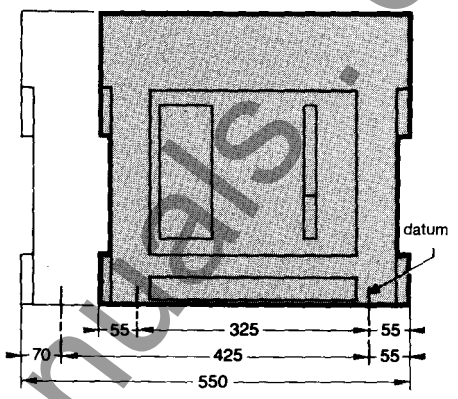
technical guide

Masterpact M08 to M32

3 or 4 poles
Drawout pattern

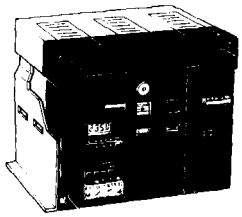


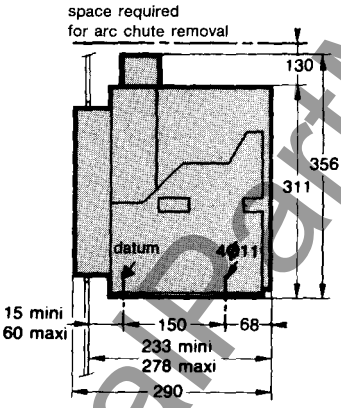


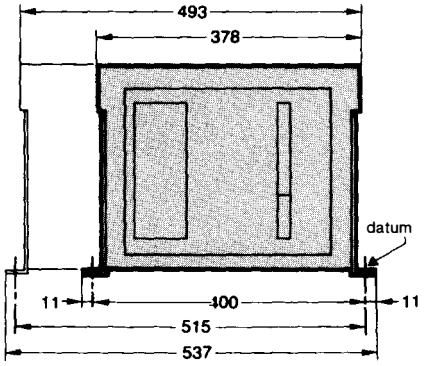


Masterpact M08 to M32

3 or 4 poles
Fixed pattern

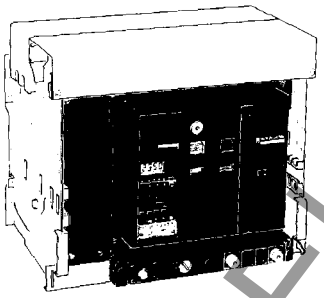


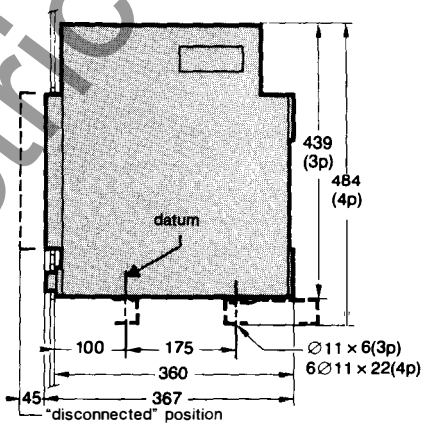


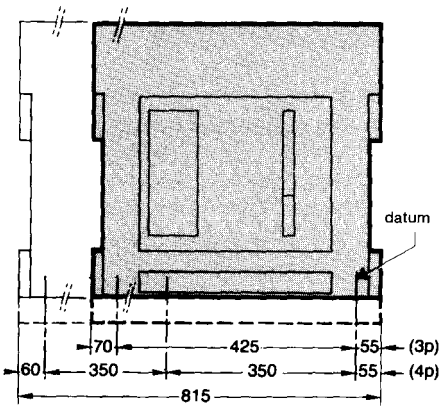


Masterpact M40

3 or 4 poles
Drawout pattern

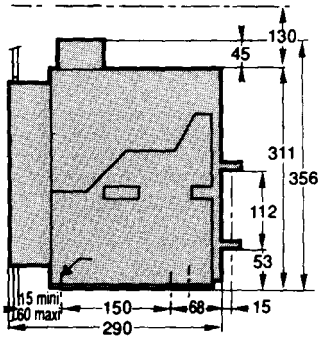


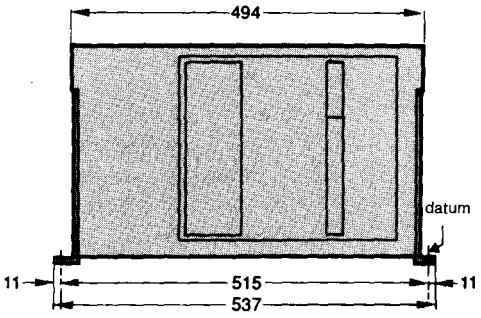




Masterpact M40

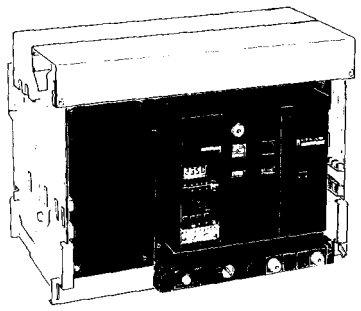
3 or 4 poles
Fixed pattern



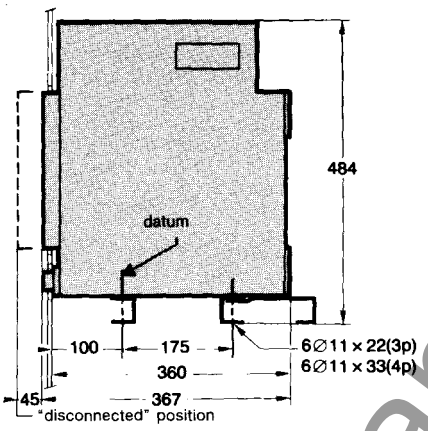


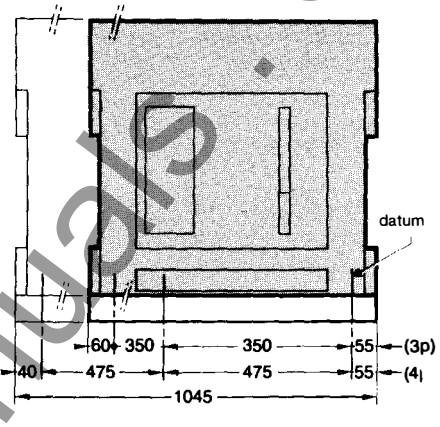
Masterpact M50

3 or 4 poles
Drawout pattern



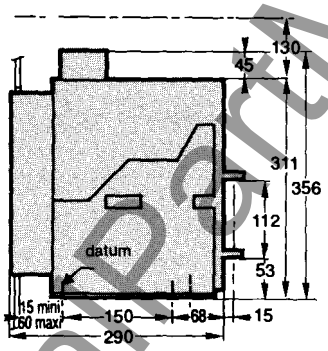
Drilling and cutout: see M40 for 3P and M63 for 4P

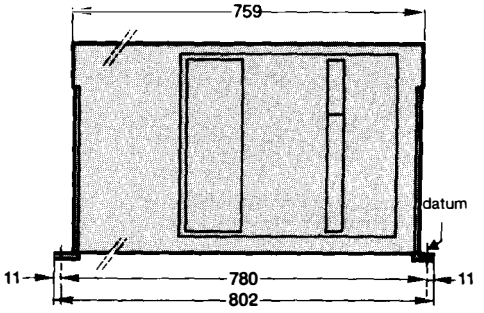




Masterpact M50

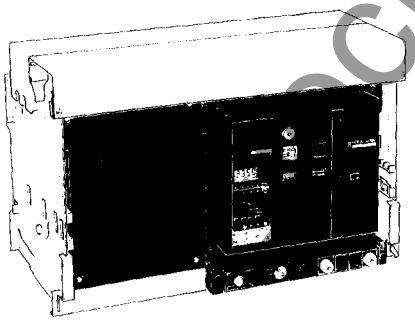
3 or 4 poles
Fixed pattern

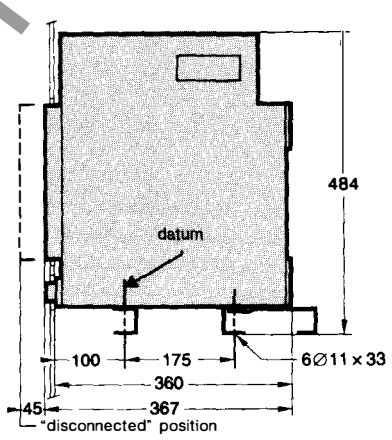


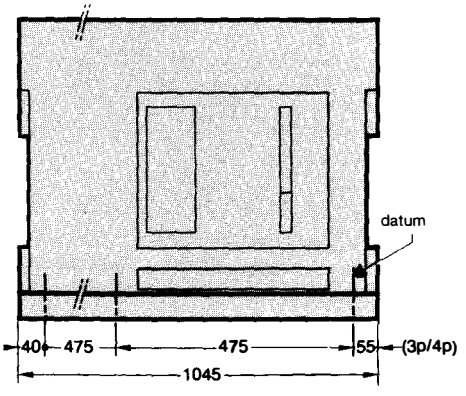


Masterpact M63

3 or 4 poles
Drawout pattern

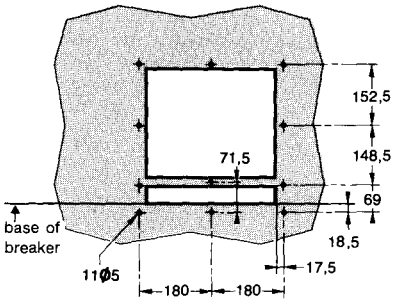




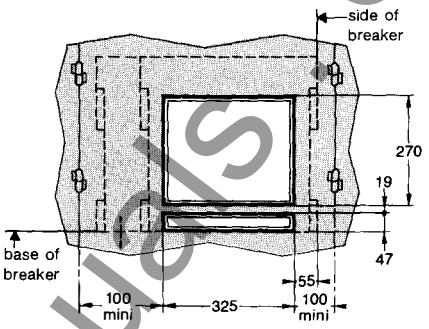


Masterpact M08 to M32
3 poles or 4 poles
Masterpact M40 3 poles
Drawout pattern

Front cover drilling for fixing door frame

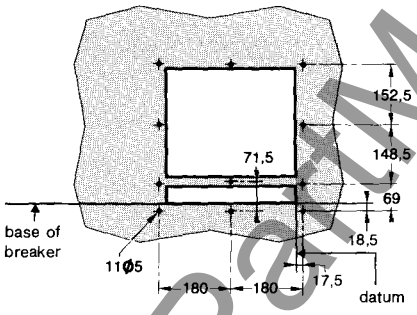


Front cover cutout

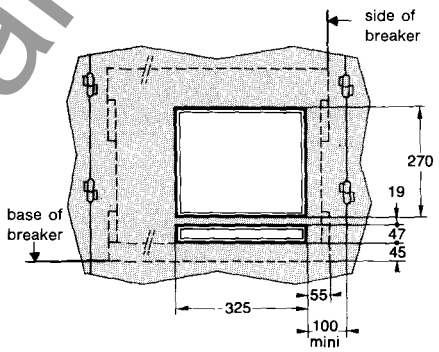


Masterpact M40 4 poles
Masterpact M50 to M63
3 poles or 4 poles
Drawout pattern

Front cover drilling for fixing door frame

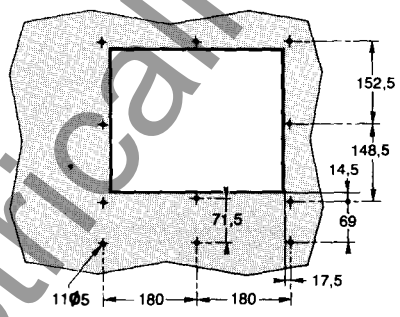


Front cover cutout

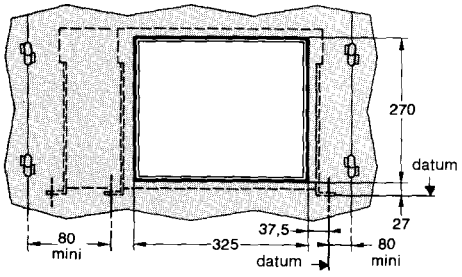


Masterpact M08 to M63
Fixed pattern

Front cover drilling for fixing door frame

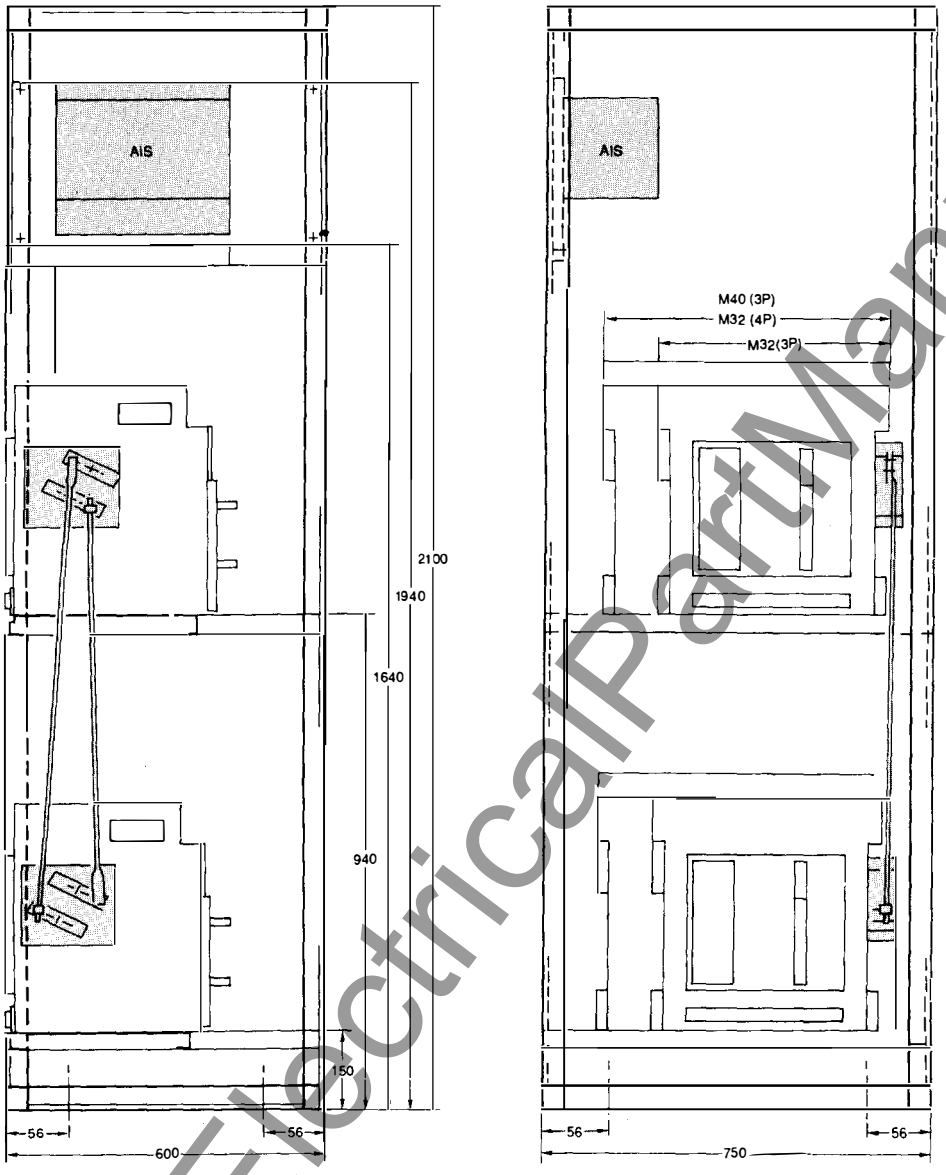


Front cover cutout



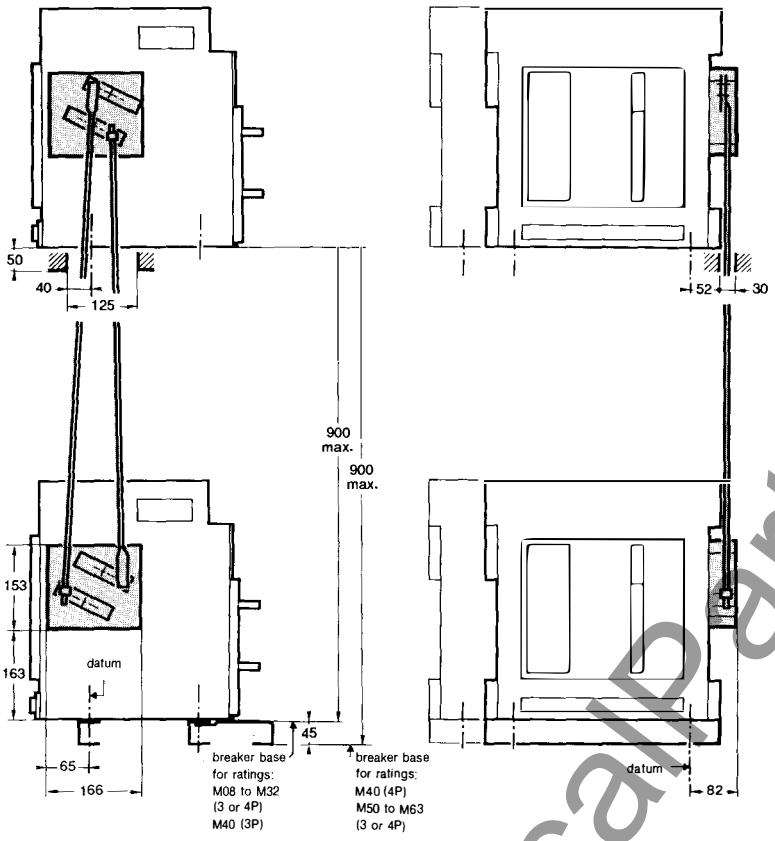
automatic source changeover system

Mounted on frame

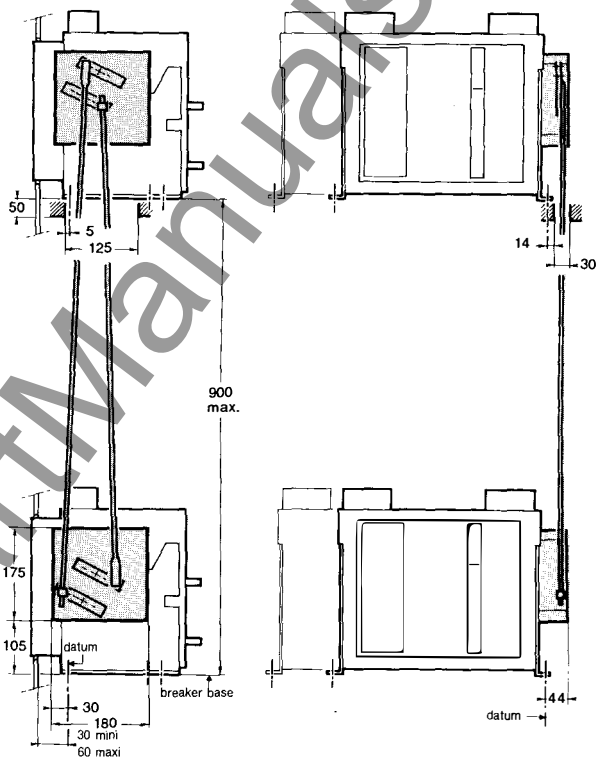


interlocking by connecting links for 2 stack-mounted breakers(1)

Drawout pattern
3 or 4 poles

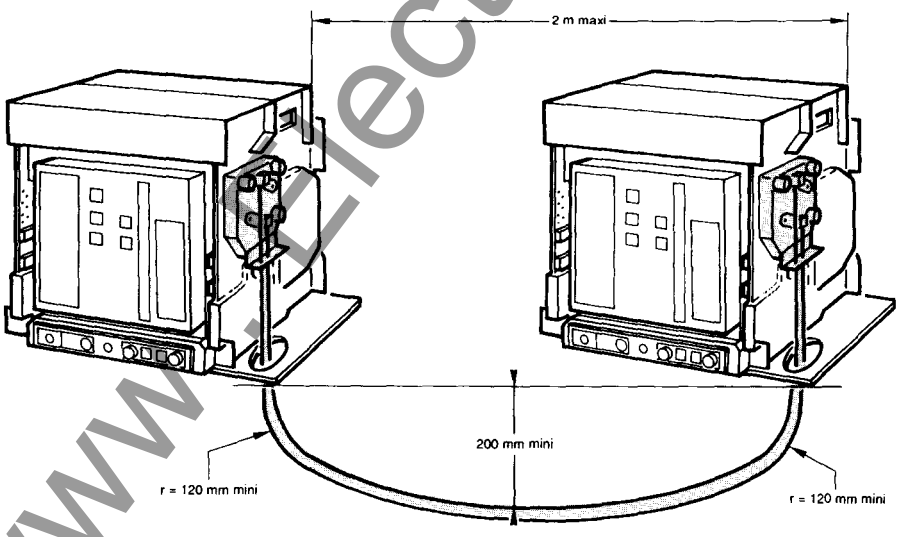


Fixed pattern
3 or 4 poles

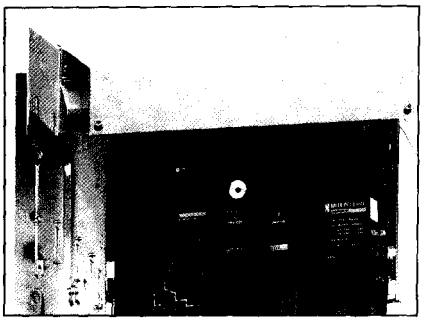


interlocking by cables for 2 side-by-side breakers

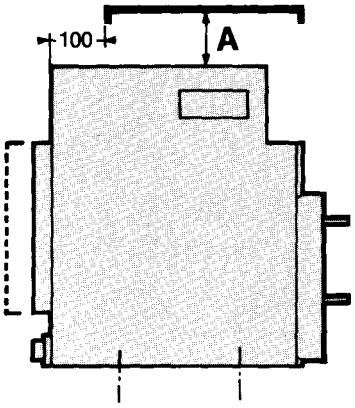
Fixed or drawout patterns
3 or 4 poles

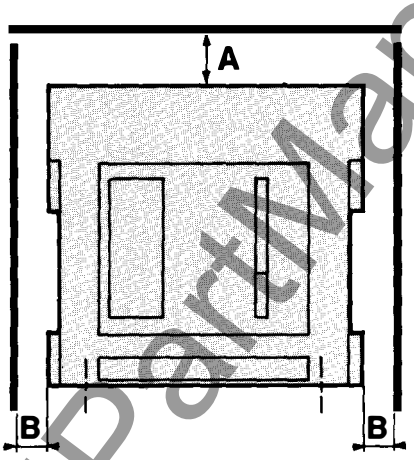


drawout breaker



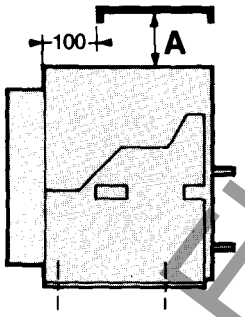
Masterpact M16H1 equipped with arc chute cover (and terminal shield).

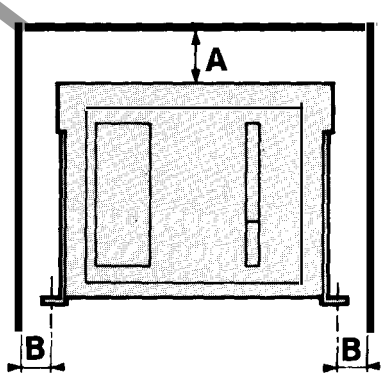




Masterpact	connection mode	to insulating parts		to metallic parts	
		A	B	A	B
M08 to M63	rear with arc chute cover	0	0	0	0
	rear without arc chute cover	0	15	150	50
	front(1)	300	15	300	50

fixed breaker

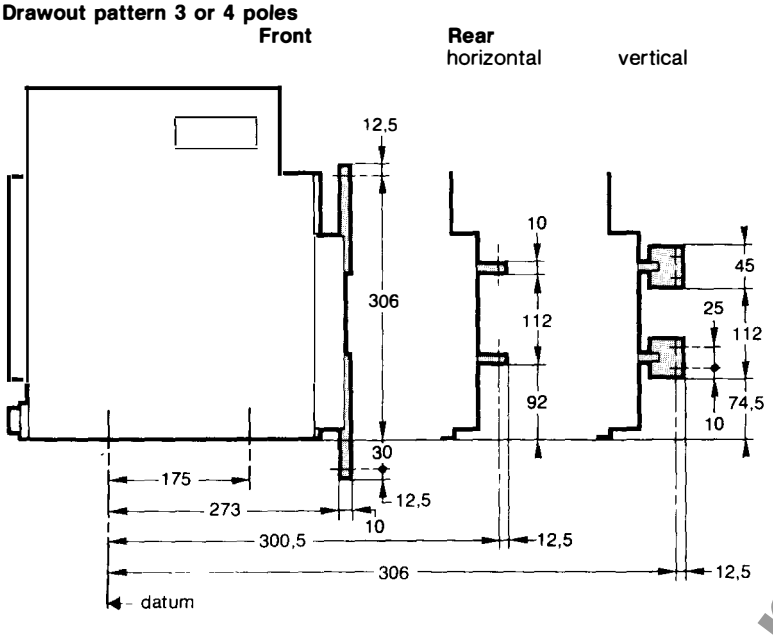




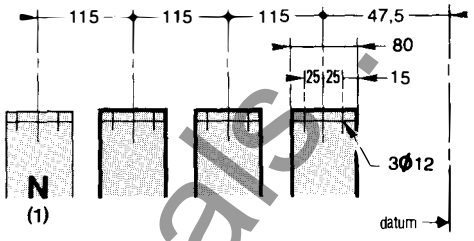
Masterpact	connection mode	to insulating parts		to metallic parts	
		A	B	A	B
M08 to M63	rear	150	30	250	70
	front(1)	385	30	385	70

Masterpact M08N/M10N/M12N

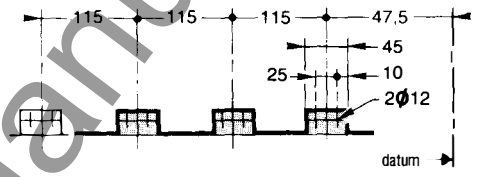
Drawout pattern 3 or 4 poles



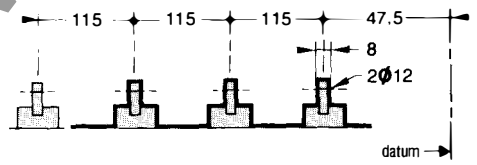
Front (front view)



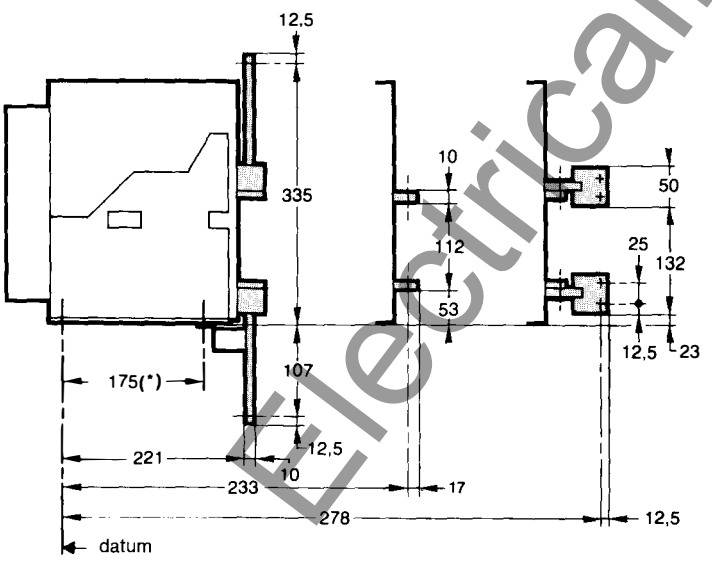
Rear (top view)
horizontal



vertical

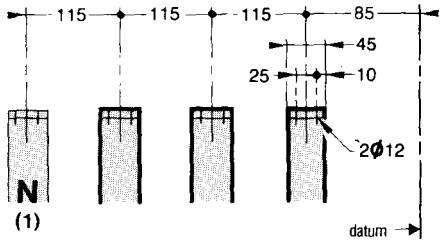


Fixed pattern 3 or 4 poles

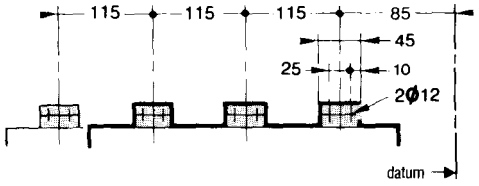


(*) fixing dimension for front connection angle

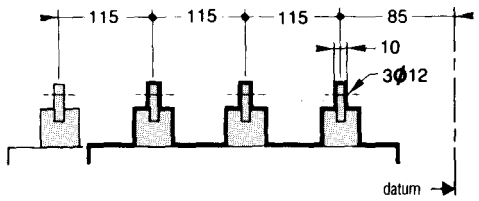
Front (front view)



Rear (top view)
horizontal



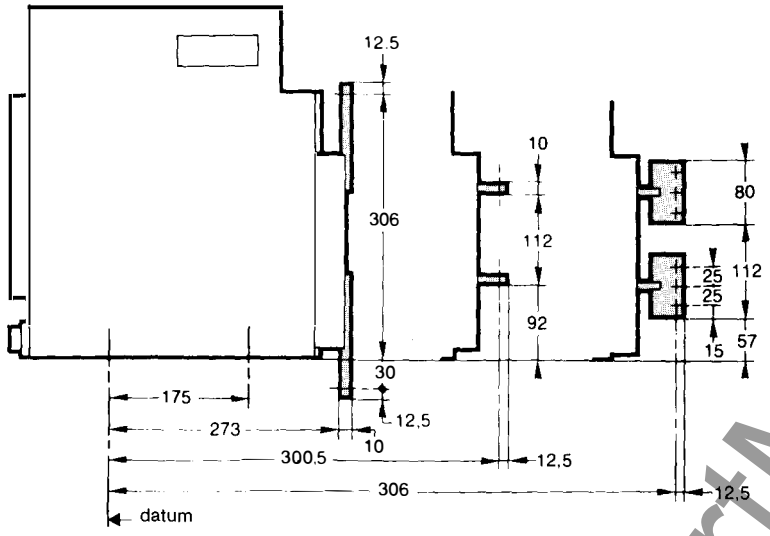
vertical



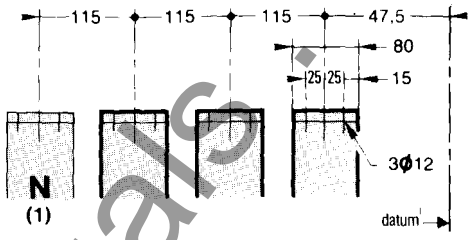
Masterpact M08H/L-M10H/L-M12H/L-M16N/H/L

Drawout pattern 3 or 4 poles

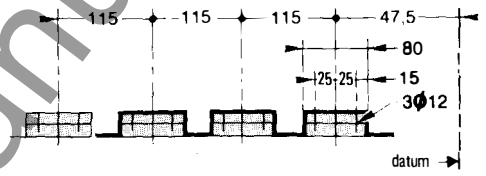
Front **Rear** horizontal vertical



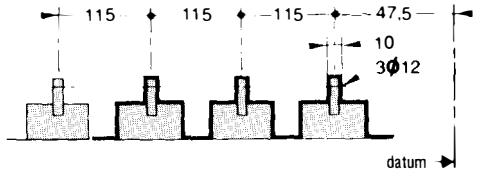
Front (front view)



Rear (top view)
horizontal

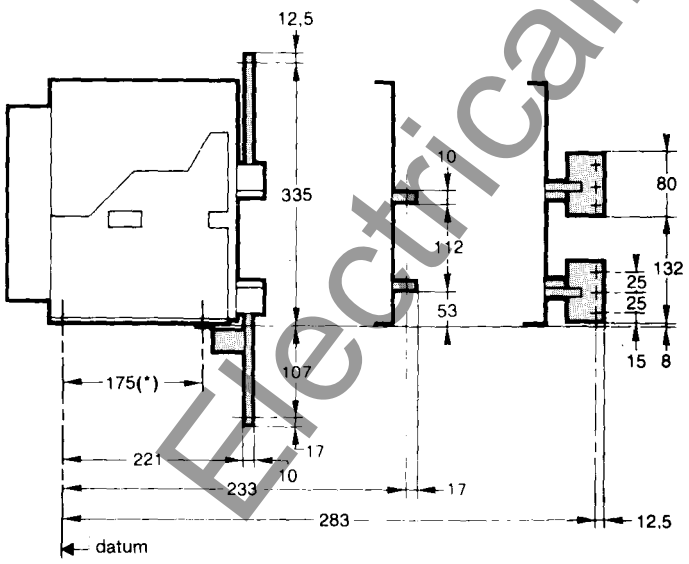


vertical



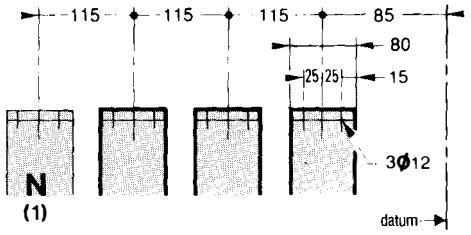
Fixed pattern 3 or 4 poles

Front **Rear** horizontal vertical

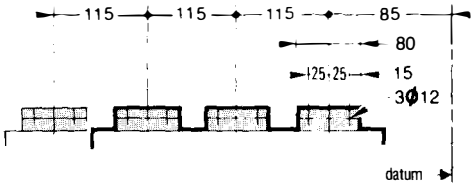


(*) fixing dimension for front connection angle

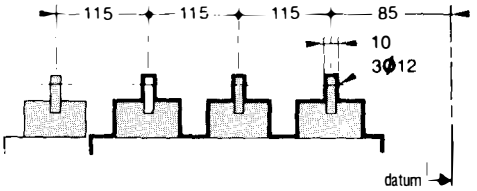
Front (front view)



Rear (top view)
horizontal

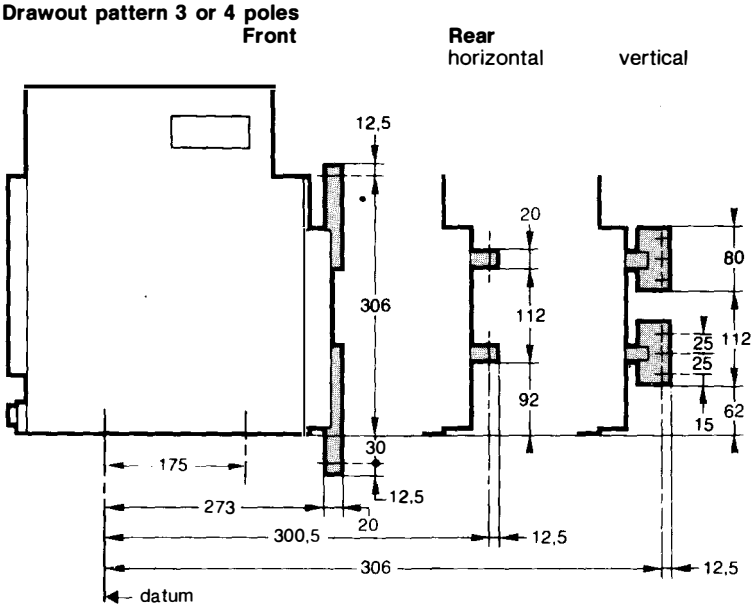


vertical

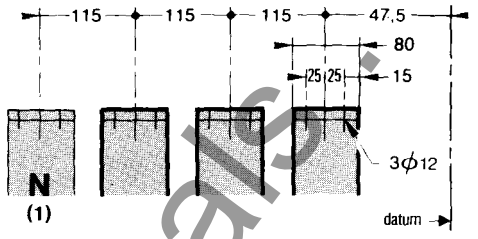


Masterpact M20N/H-M25N/H

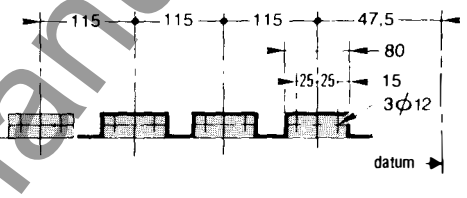
Drawout pattern 3 or 4 poles



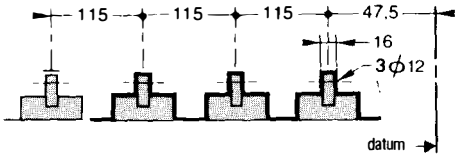
Front (front view)



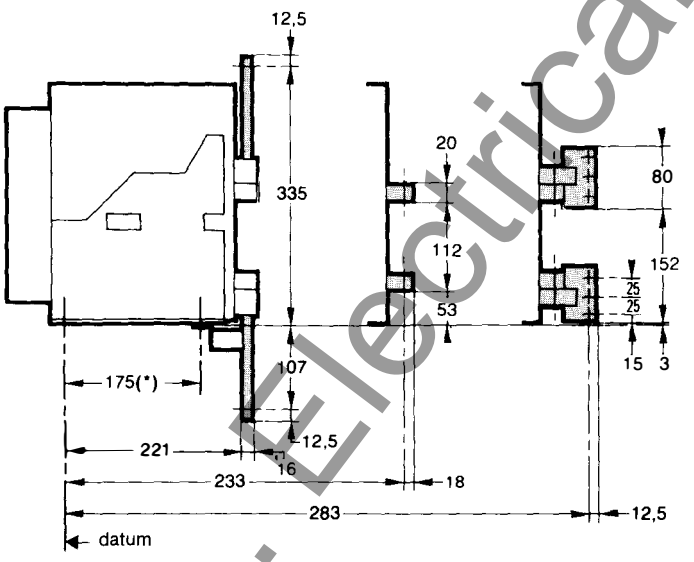
Rear (top view)
horizontal



vertical

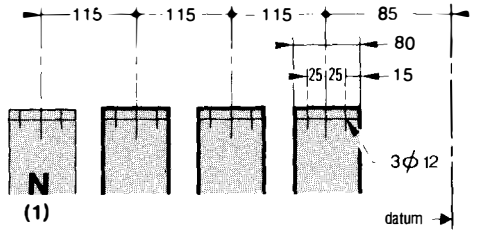


Fixed pattern 3 or 4 poles

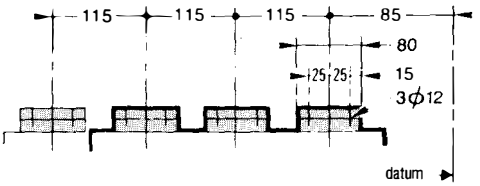


(*) fixing dimension for front connection angle

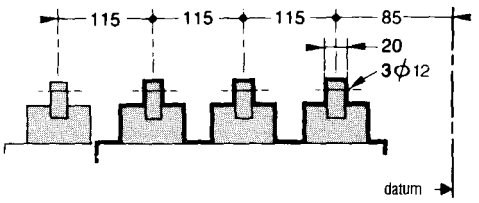
Front (front view)



Rear (top view)
horizontal

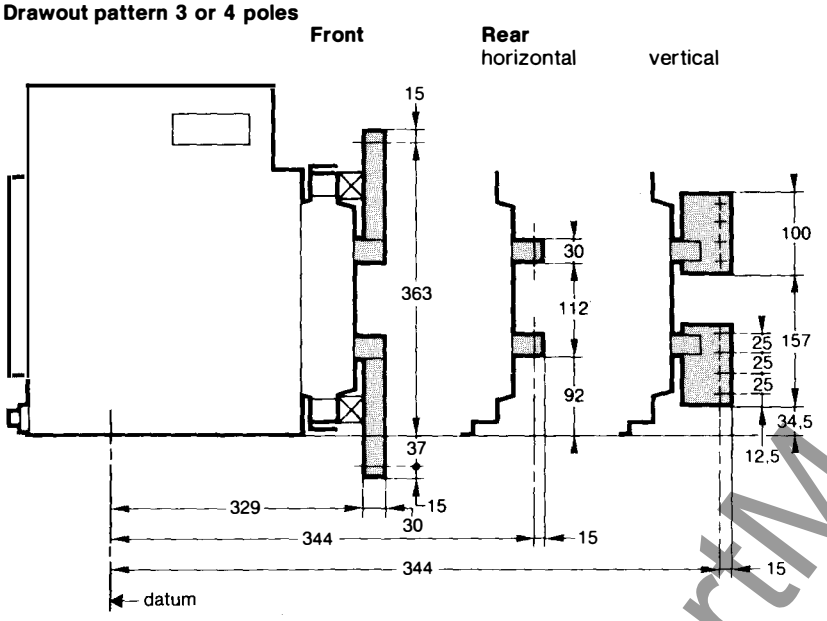


vertical

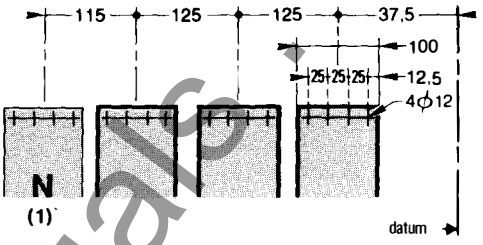


Masterpact M20L/M25L/M32H

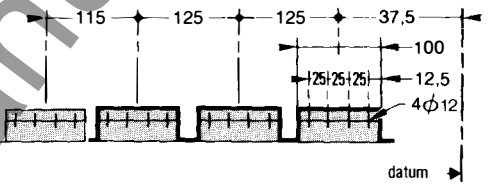
Drawout pattern 3 or 4 poles



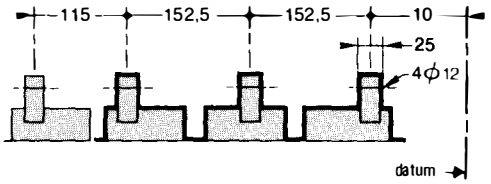
Front (front view)



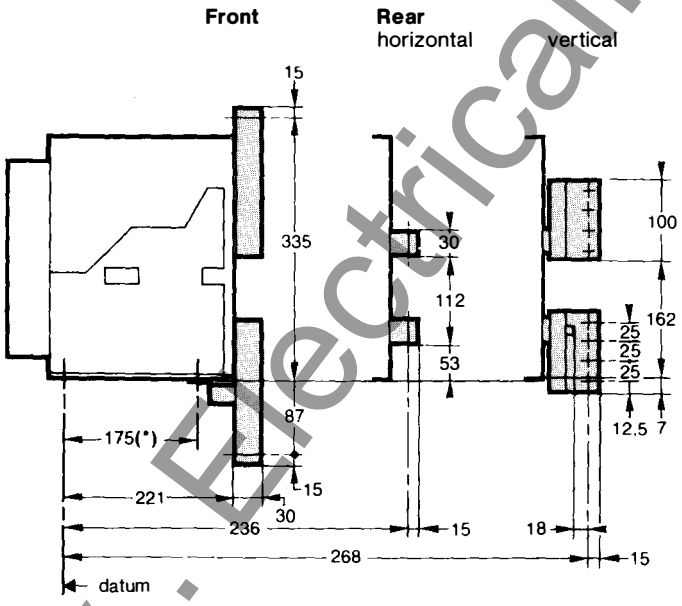
Rear (top view)
horizontal



vertical

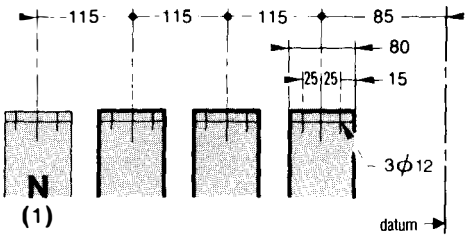


Fixed pattern 3 or 4 poles

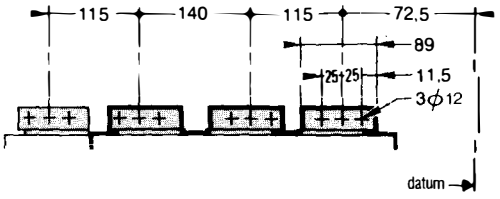


(*) fixing dimension for front connection angle

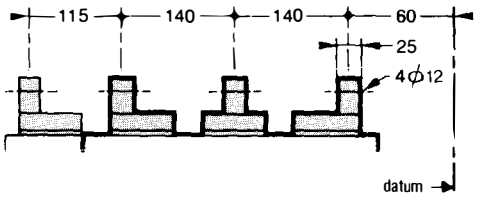
Front (front view)



Rear (top view)
horizontal

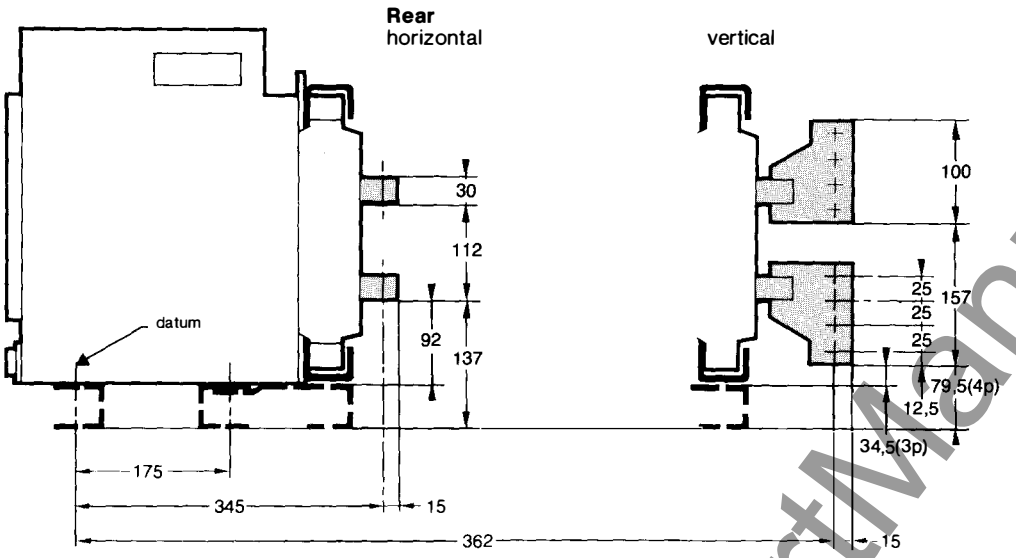


vertical

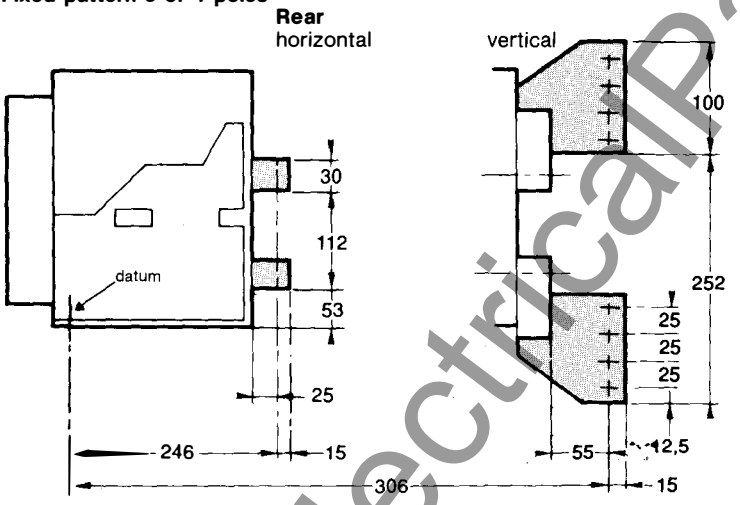


Masterpact M40

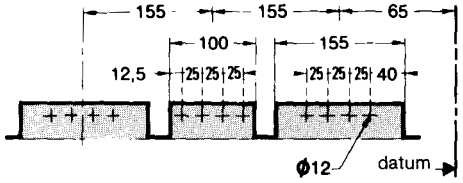
Drawout pattern 3 or 4 poles



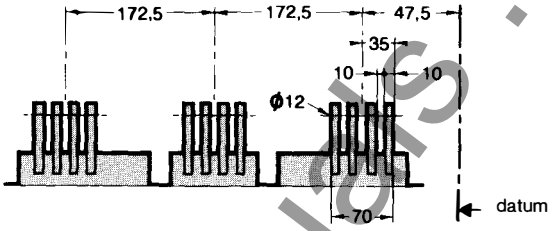
Fixed pattern 3 or 4 poles



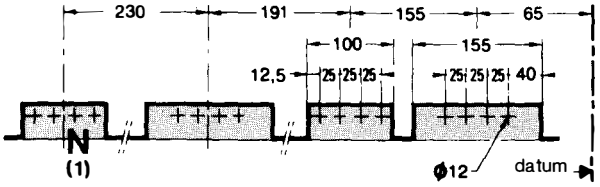
3 poles
Rear (top view) horizontal



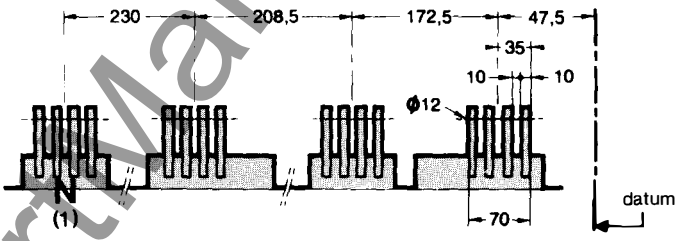
vertical



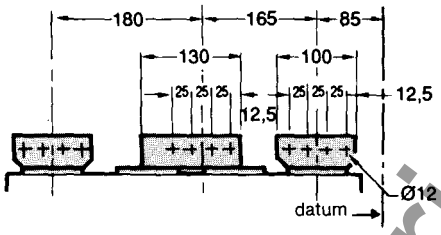
4 poles
Rear (top view) horizontal



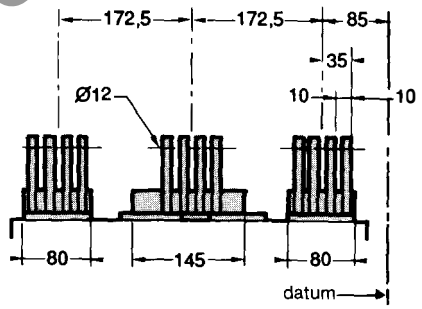
vertical



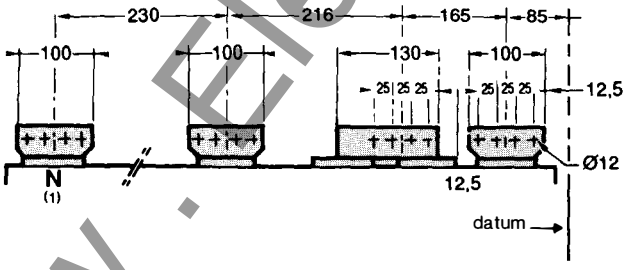
3 poles
Rear (top view) horizontal



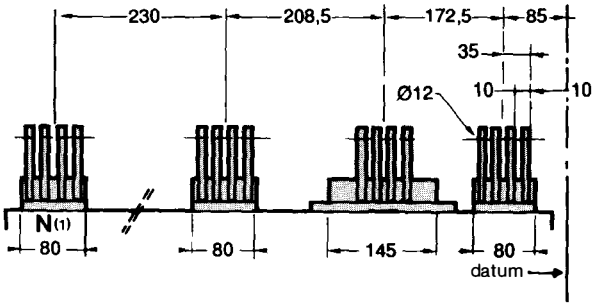
vertical



4 poles
Rear (top view) horizontal

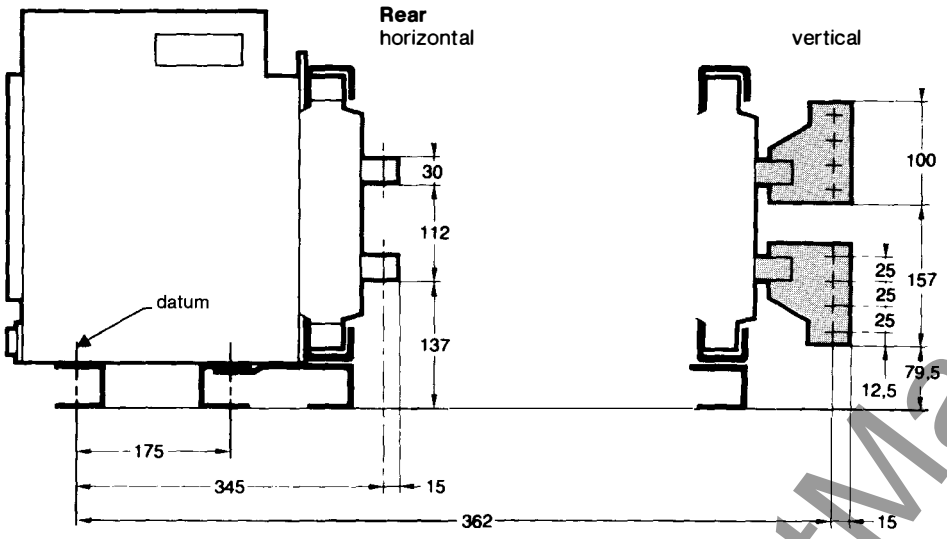


vertical

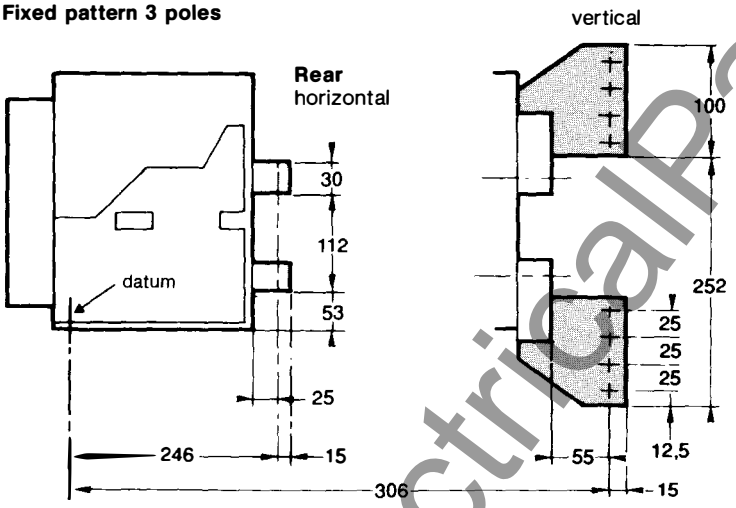


Masterpact M50

Drawout pattern 3 or 4 poles

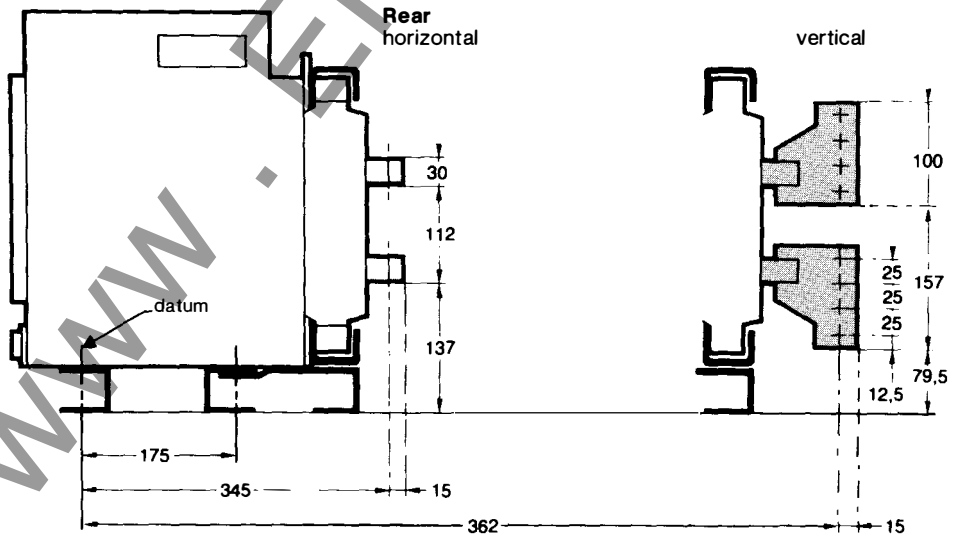


Fixed pattern 3 poles

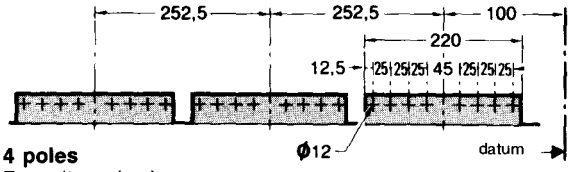


Masterpact M63

Drawout pattern 3 or 4 poles

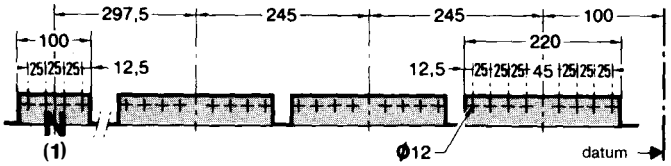


3 poles
Rear (top view)
horizontal

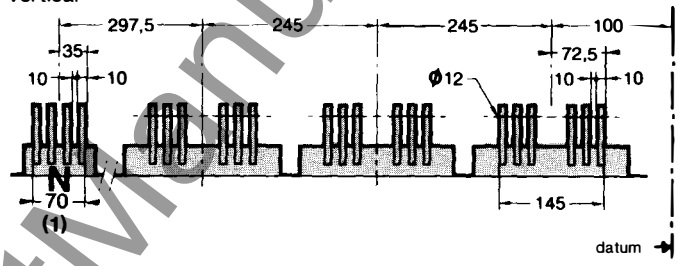


vertical

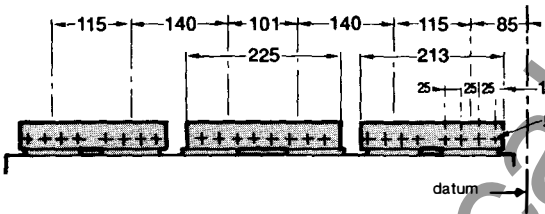
4 poles
Rear (top view)
horizontal



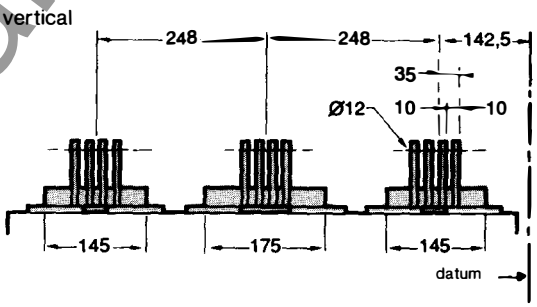
vertical



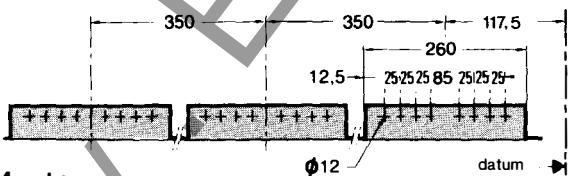
3 poles
Rear (top view)
horizontal



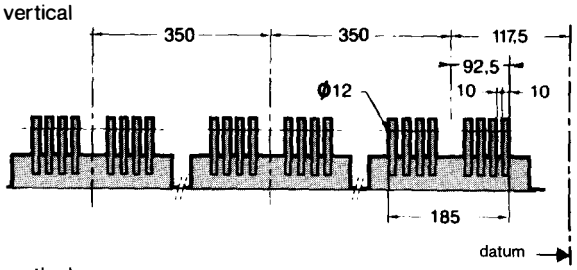
vertical



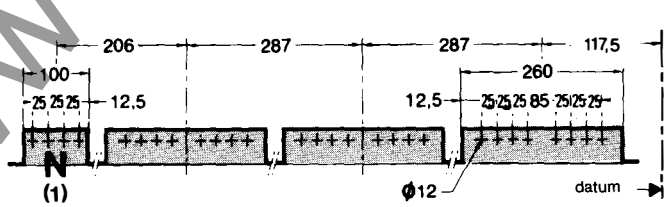
3 poles
Rear (top view)
horizontal



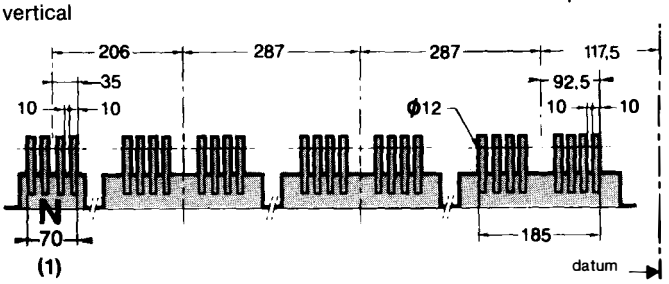
vertical



4 poles
Rear (top view)
horizontal



vertical



other characteristics

degree of protection

The protection index of Masterpact breakers depends mainly on their installation:
- IP 305 for open air mounting (on panel or brackets);
- IP 405 for cubicle mounted breaker with operating access through door frame;
- IP 549 for breaker mounted behind door with heavy duty transparent cover.

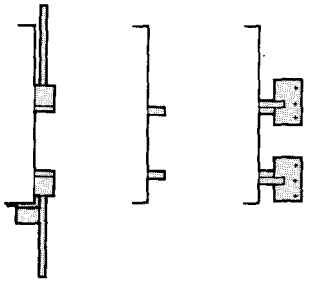
tropicalisation

As standard, Masterpact circuit breakers comply with the following standard:
- IEC 62-30 (T2 tropicalisation): relative humidity 95 % at 45 °C, and 80 % at 55 °C (hot, humid climate);
- IEC 6-82-11: salt spray resistance.

Corrosive environments: for protective coatings using special greases or gold plating, consult us.

ambient temperature

The electrical and mechanical characteristics are specified for an ambient temperature between −5 and +60 °C.
Masterpact circuit breakers operate from −10 to +70 °C, however the accuracy of the control unit settings is not guaranteed under these circumstances.
In addition, Masterpact circuit breakers comply with IEC standards 68.2.1 and 68.2.2: exceptional storage temperature from −50 to +100 °C.



The table below indicates the maximum current rating, for each connection type, as a function of the ambient temperature around the circuit breaker and the busbars.

Current rating (A) as a function ambient temperature (°C)

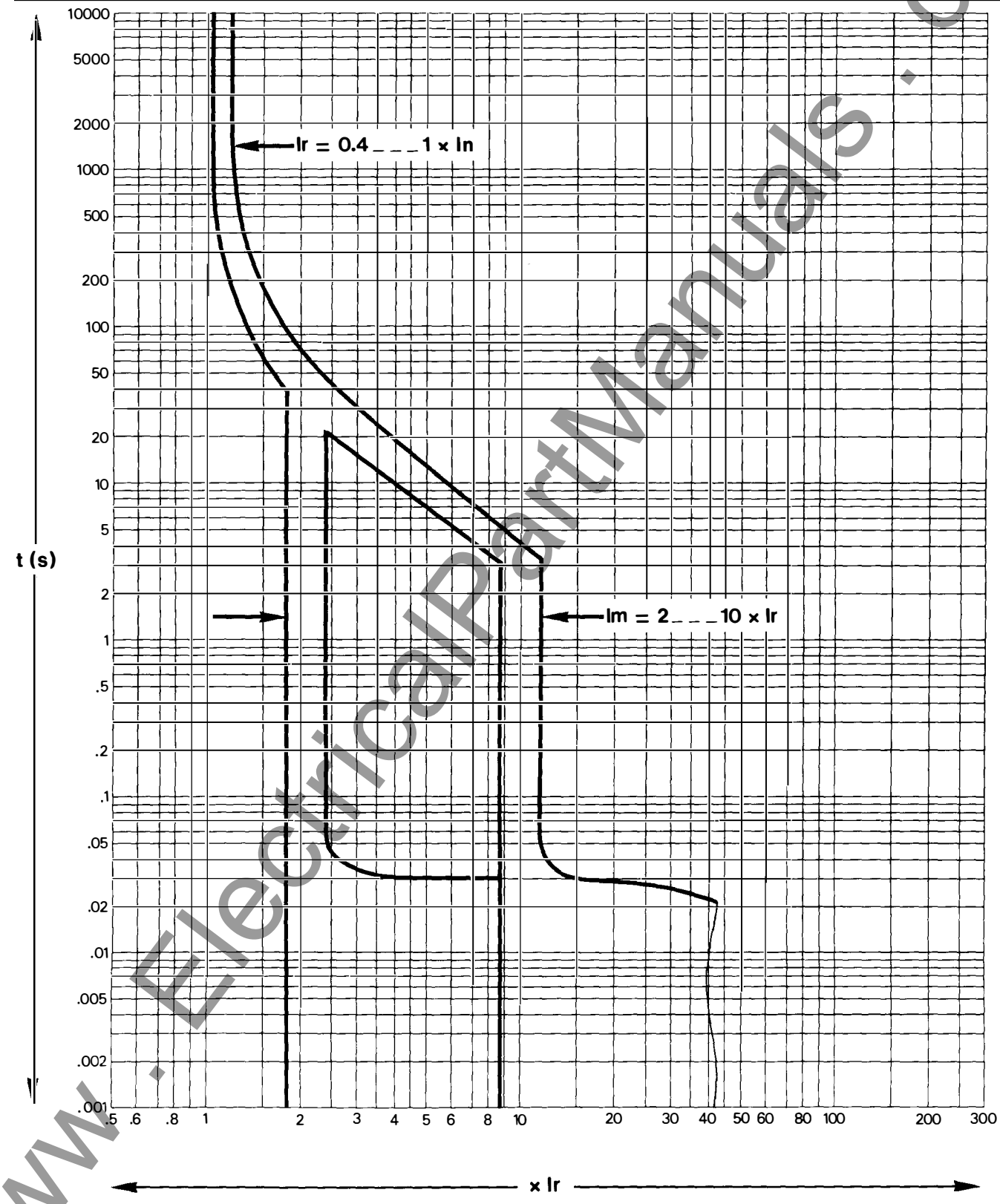
Masterpact			M08N/H/L	M10N/H/L	M12N	M12H	M12L	M16N/H	M16L	M20N/H	M20L	M25N/H	M25L	M32H	M40H	M50H	M63H
version	connection	T °C															
drawout	Front or rear	40	800	1 000	1 250	1 250	1 250	1 600	1 600	2 000	2 000	2 500	2 500	3 150	3 800	5 000	6 000
	horizontal	45	800	1 000	1 250	1 250	1 250	1 600	1 600	2 000	2 000	2 500	2 350	3 080	3 650	4 750	5 700
		50	800	1 000	1 250	1 250	1 250	1 600	1 600	2 000	2 000	2 430	2 250	3 000	3 500	4 500	5 400
		55	800	1 000	1 250	1 250	1 250	1 600	1 600	2 000	2 000	2 350	2 150	2 900	3 300	4 250	5 100
		60	800	1 000	1 200	1 250	1 250	1 550	1 500	1 900	1 900	2 250	2 000	2 800	3 100	4 000	4 800
	Rear vertical	40	800	1 000	1 250	1 250	1 250	1 600	1 600	2 000	2 000	2 500	2 500	3 200	4 000	5 000	6 300
		45	800	1 000	1 250	1 250	1 250	1 600	1 600	2 000	2 000	2 500	2 500	3 200	3 800	5 000	6 000
		50	800	1 000	1 250	1 250	1 250	1 600	1 600	2 000	2 000	2 500	2 500	3 100	3 600	5 000	5 700
		55	800	1 000	1 250	1 250	1 250	1 600	1 600	2 000	2 000	2 500	2 350	3 000	3 400	5 000	5 400
		60	800	1 000	1 250	1 250	1 250	1 550	1 600	1 900	1 900	2 400	2 200	2 900	3 200	4 700	5 100
fixed	Front or rear	40	800	1 000	1 250	1 250	1 250	1 600	1 600	2 000	2 000	2 500	2 500	3 200	4 000	5 000	
	horizontal	45	800	1 000	1 250	1 250	1 250	1 600	1 600	2 000	2 000	2 500	2 500	3 200	4 000	5 000	
		50	800	1 000	1 250	1 250	1 250	1 600	1 600	2 000	2 000	2 500	2 500	3 200	4 000	5 000	
		55	800	1 000	1 250	1 250	1 250	1 600	1 600	2 000	2 000	2 500	2 500	3 200	3 900	5 000	
		60	800	1 000	1 250	1 250	1 250	1 600	1 600	2 000	2 000	2 500	2 300	3 100	3 800	5 000	
	Rear vertical	40	800	1 000	1 250	1 250	1 250	1 600	1 600	2 000	2 000	2 500	2 500	3 200	4 000	5 000	
		45	800	1 000	1 250	1 250	1 250	1 600	1 600	2 000	2 000	2 500	2 500	3 200	4 000	5 000	
		50	800	1 000	1 250	1 250	1 250	1 600	1 600	2 000	2 000	2 500	2 500	3 200	4 000	5 000	
		55	800	1 000	1 250	1 250	1 250	1 600	1 600	2 000	2 000	2 500	2 500	3 200	4 000	5 000	
		60	800	1 000	1 250	1 250	1 250	1 600	1 600	2 000	2 000	2 500	2 500	3 100	3 900	5 000	

Power dissipation and resistance between inputs/outputs

power(1)	drawout	160	250	360	230	360	390	460	365	500	520	780	803	1 250	1 150	1 200	
dissipated (W)	fixed	66	103	150	100	150	170	220	180	250	260	390	500	780	700		
input/output	drawout	53	53	53	32	50	32	31	18	23	17	23	15	15	9	9	
resistance(2)	fixed	22	22	22	14	36	14	12	9	10	8	10	10	10	10	8	
(mΩ)																	

time/current characteristic curves

ST208D

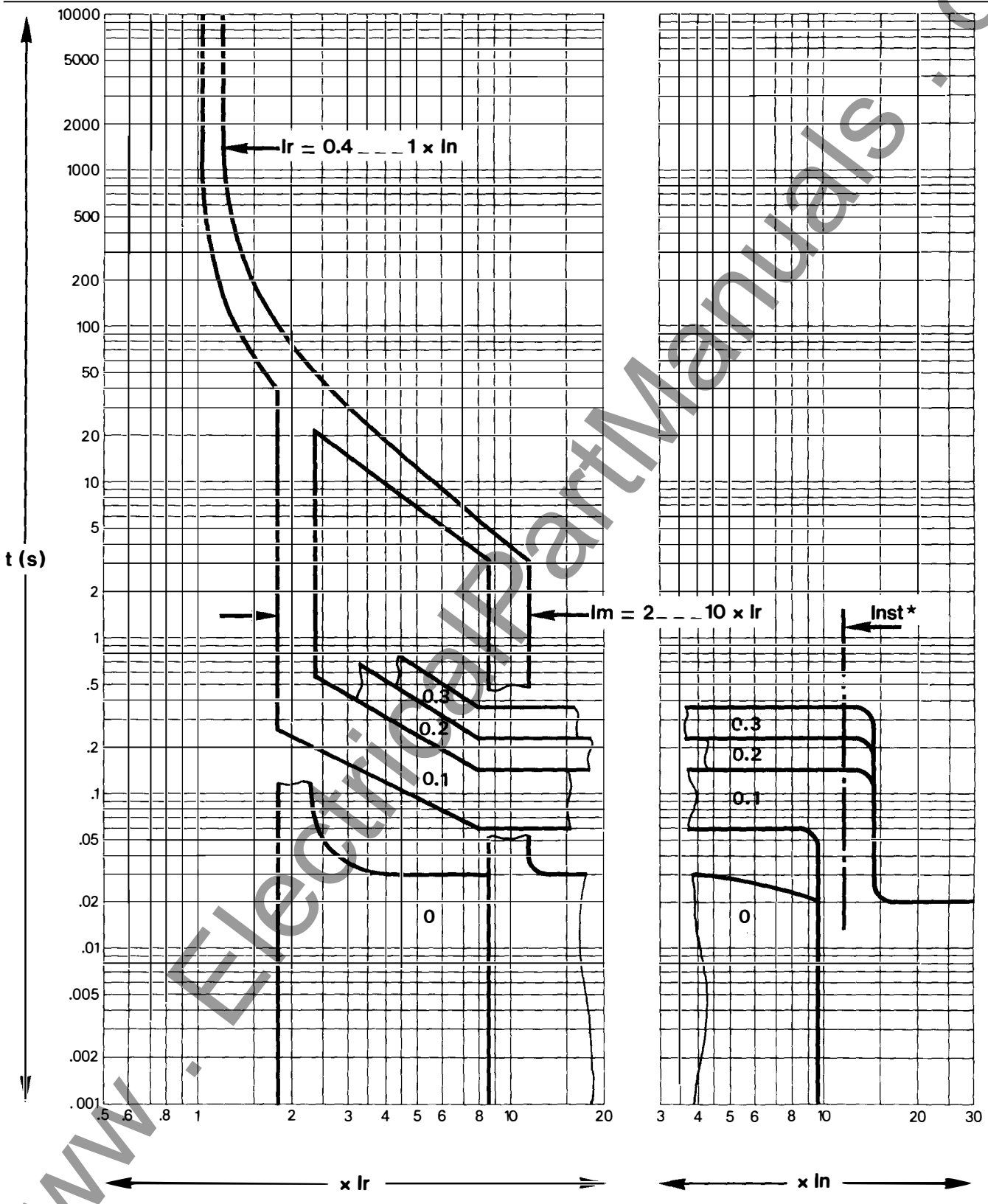


In = current rating of sensor

time / current characteristic curves

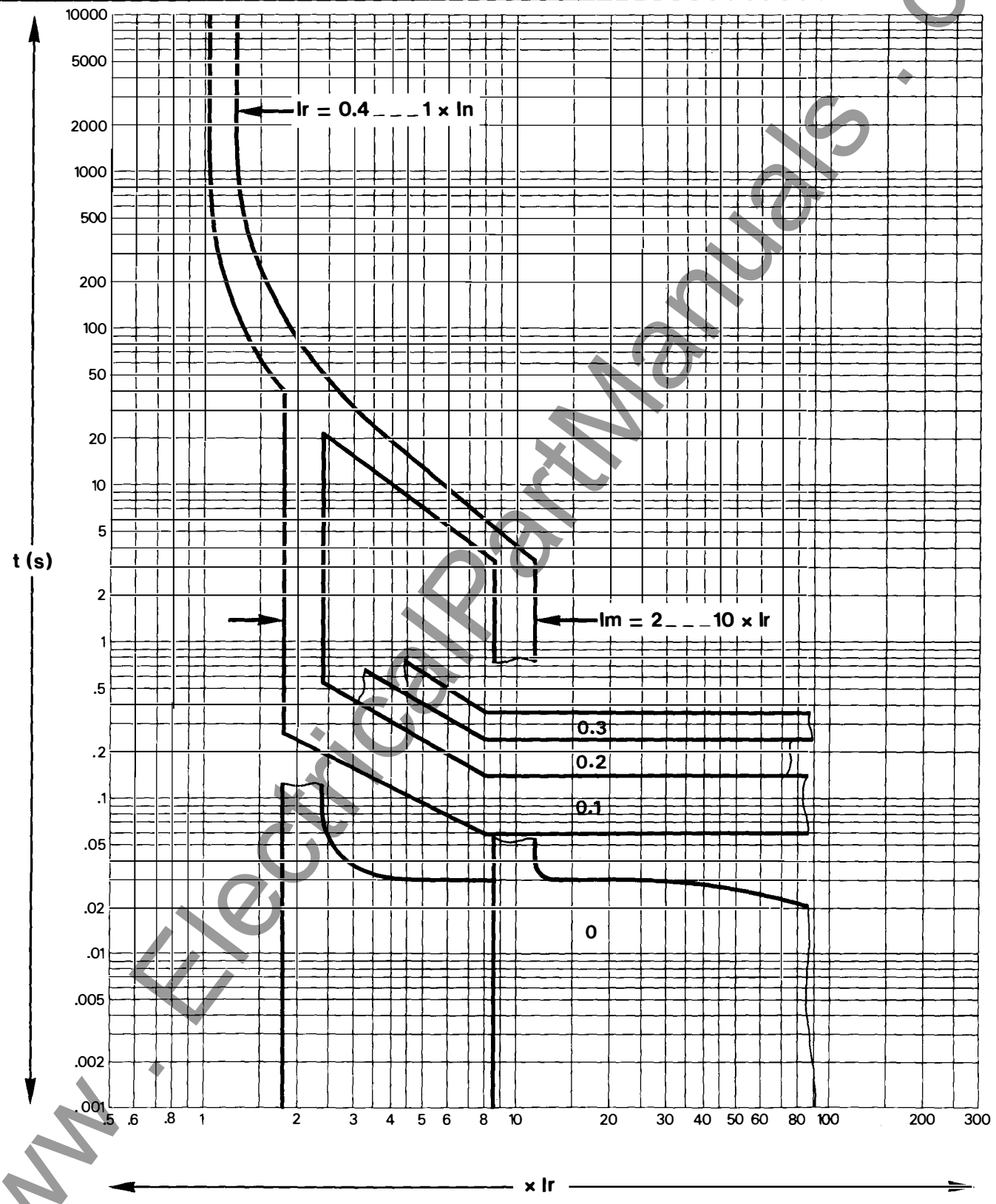
ST308S

(cont.)



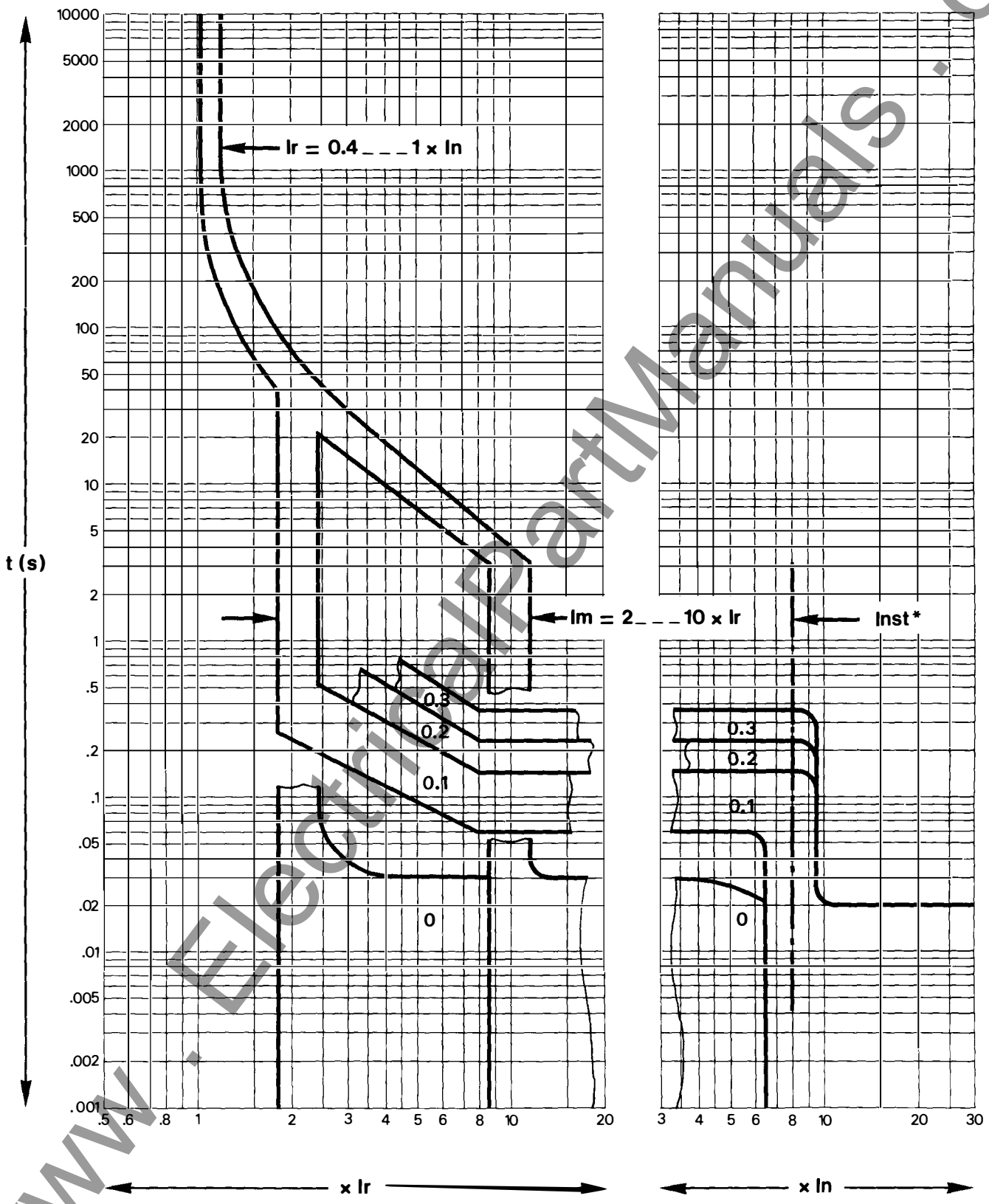
In current rating of sensor

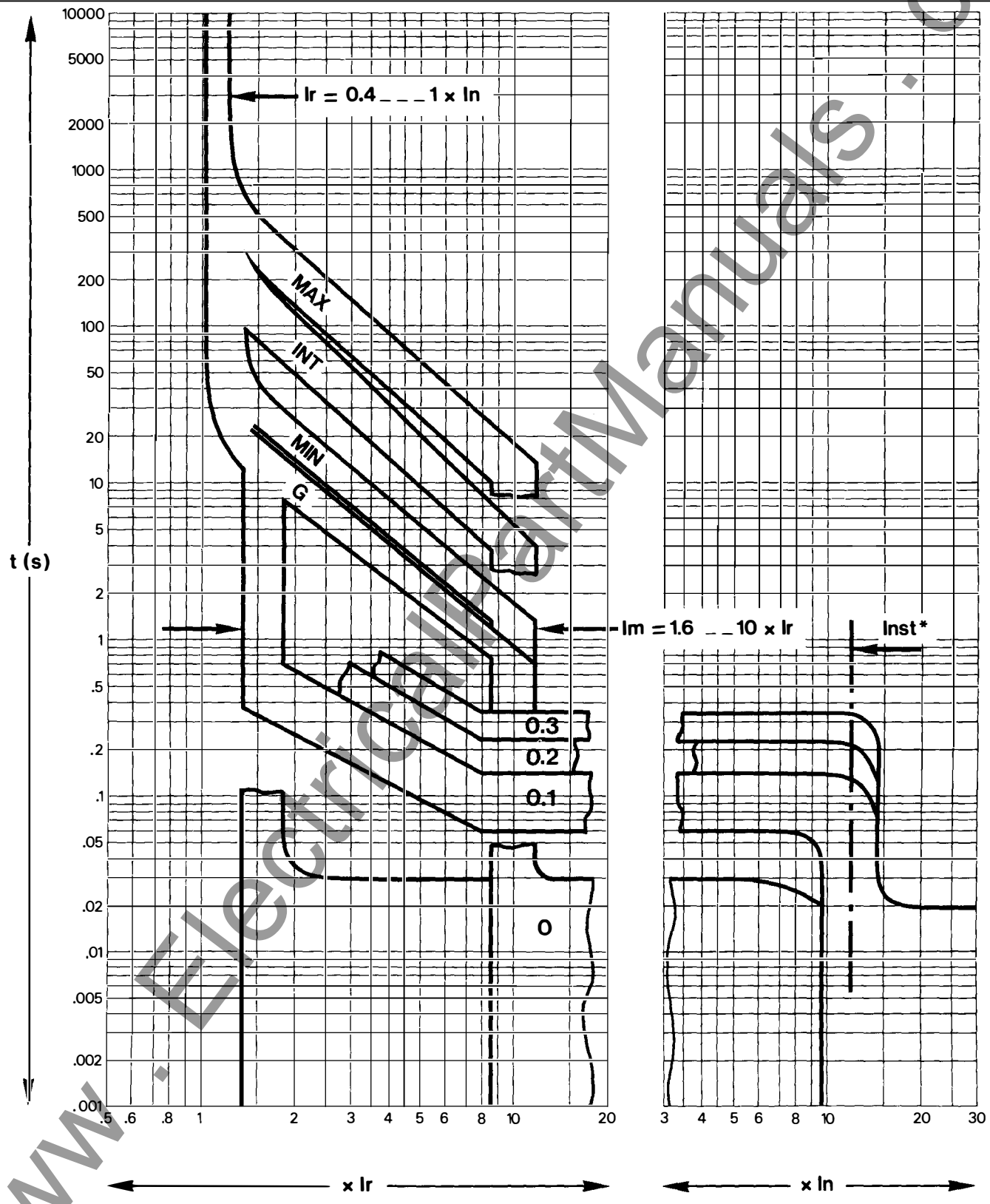
* Inst.



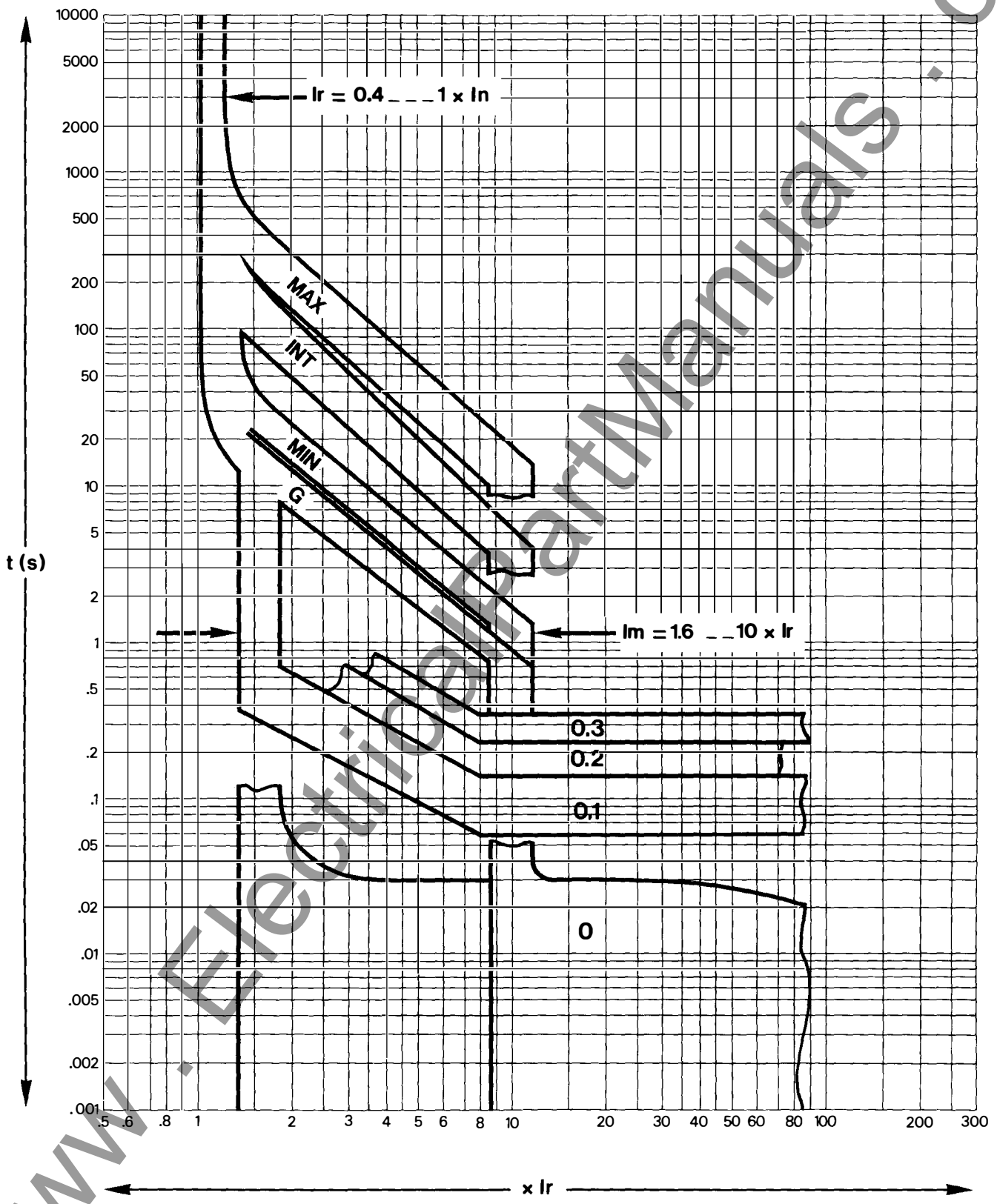
time/current characteristic curves
(cont.)

ST308L

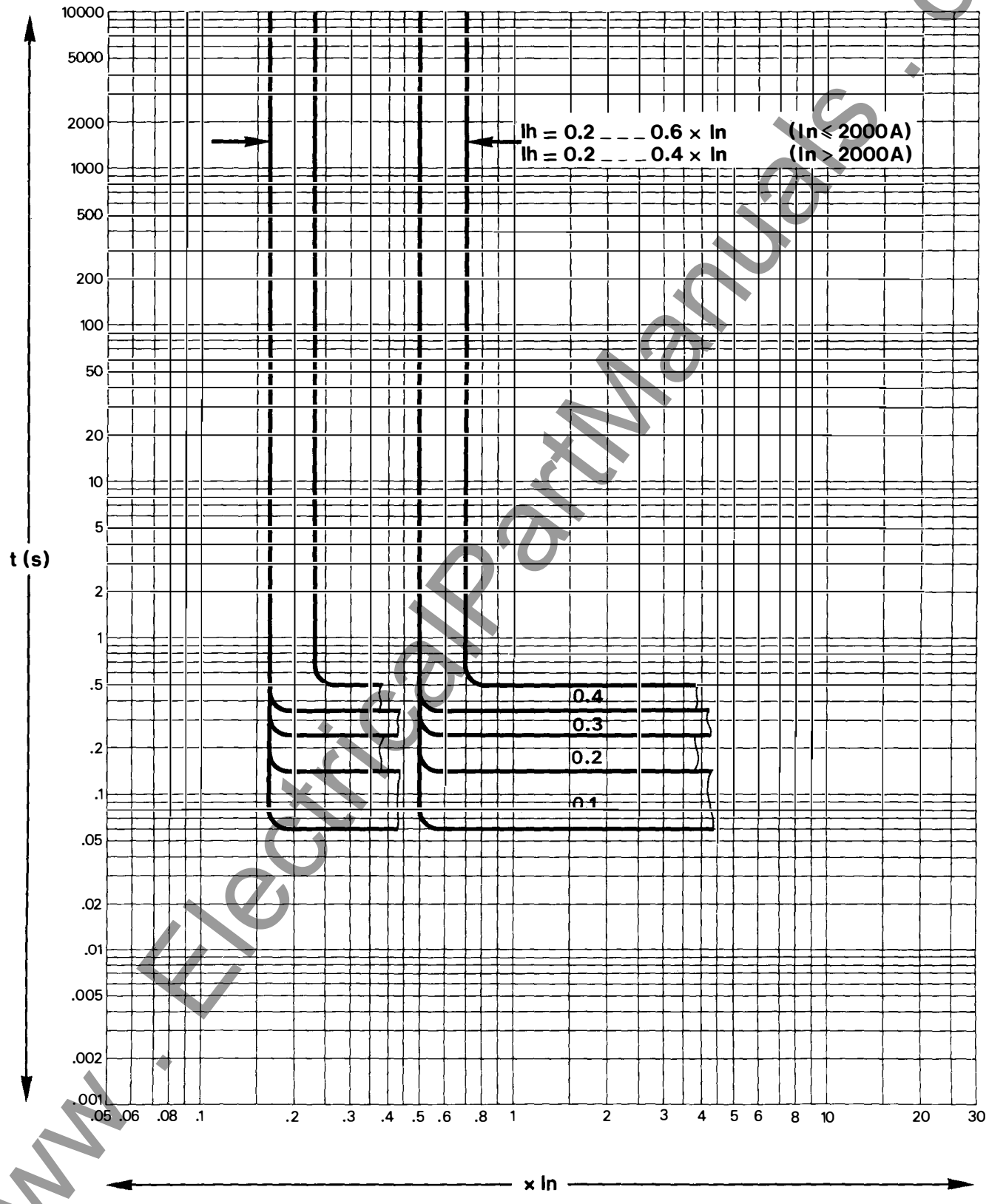




time/current characteristic curves
(cont.)

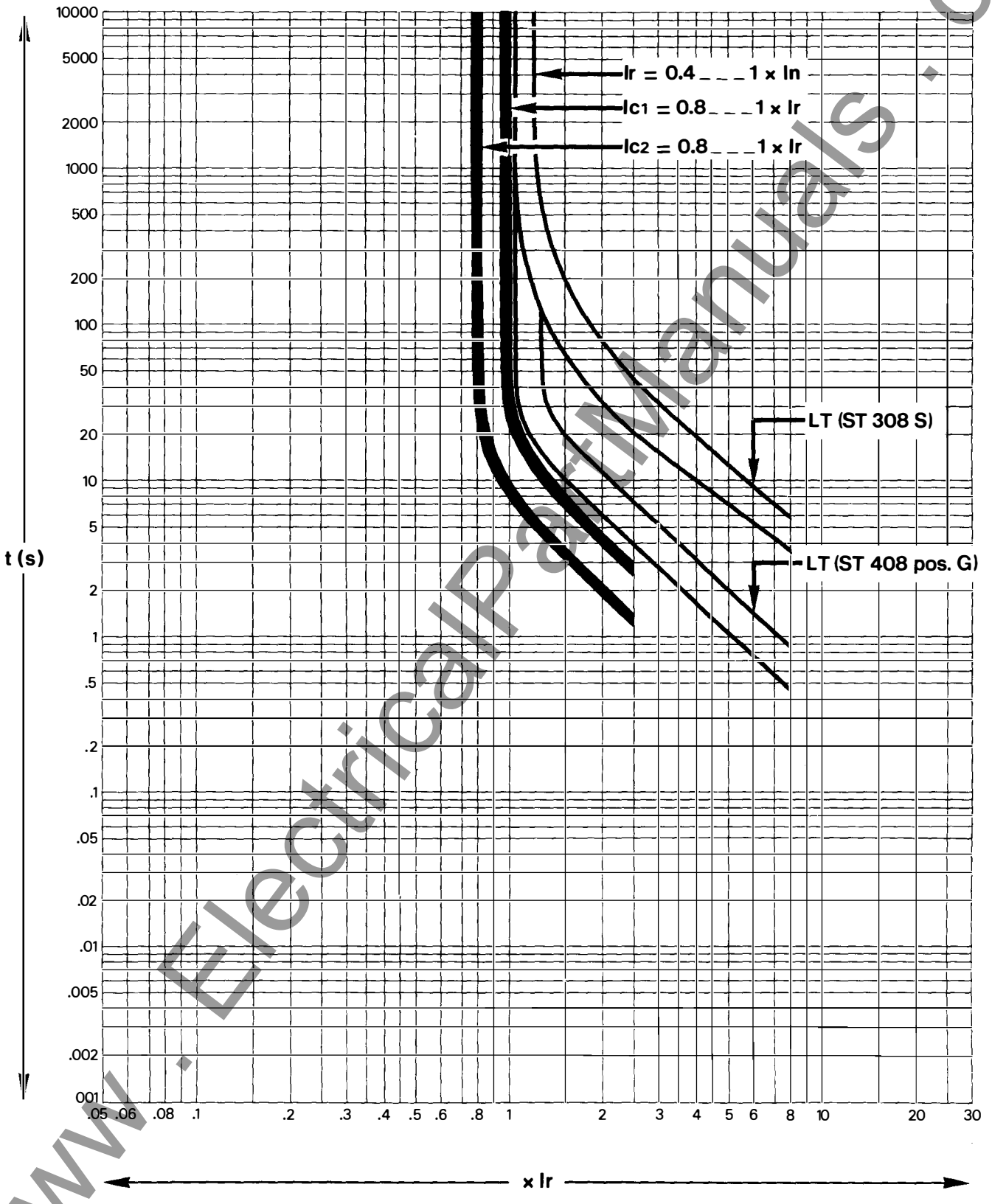


In = current rating of sensor

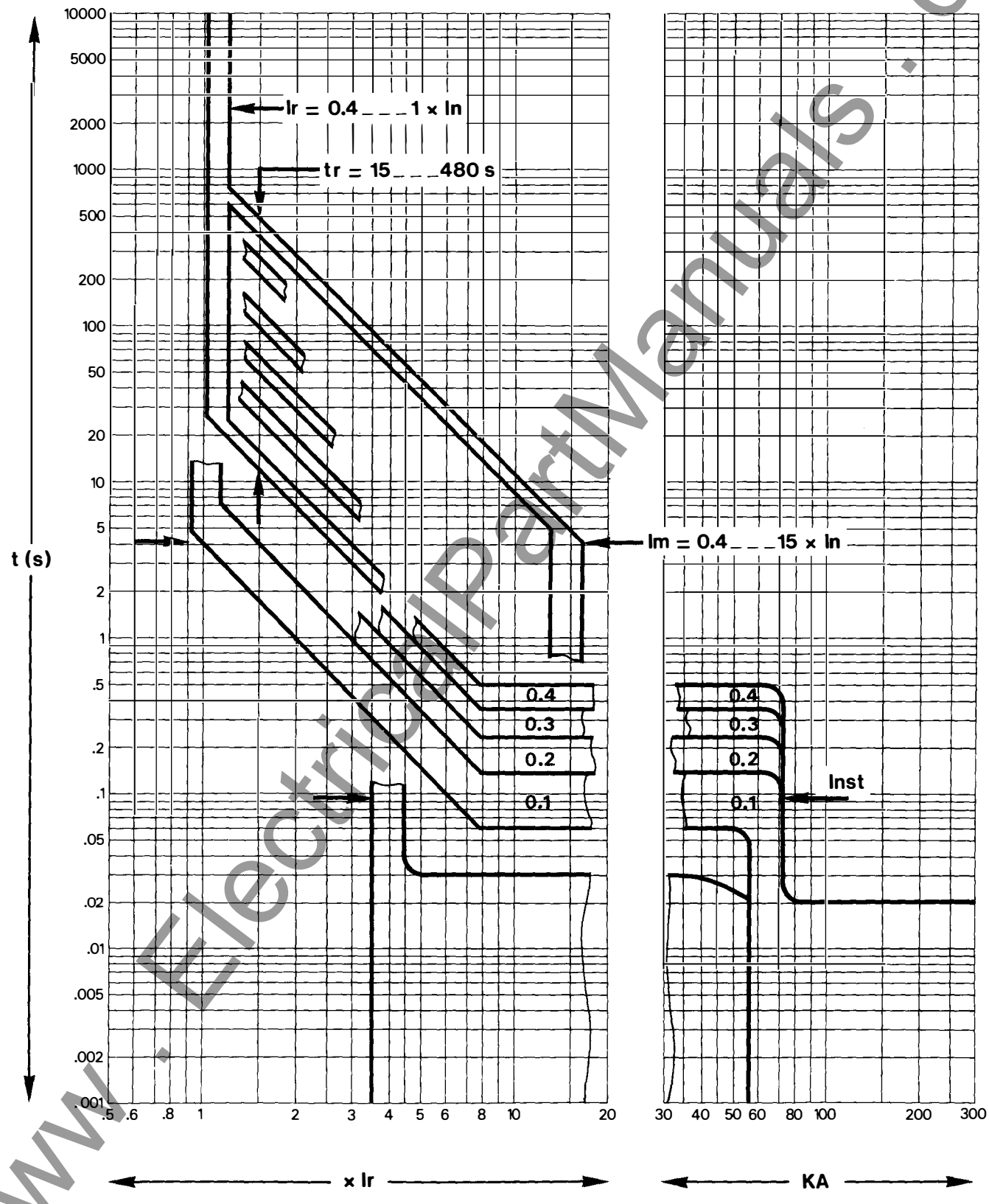


time/current characteristic curves
(cont.)

ST308/ST408/ST318/ST418
load monitoring and
control R



Ir = current rating of sensor

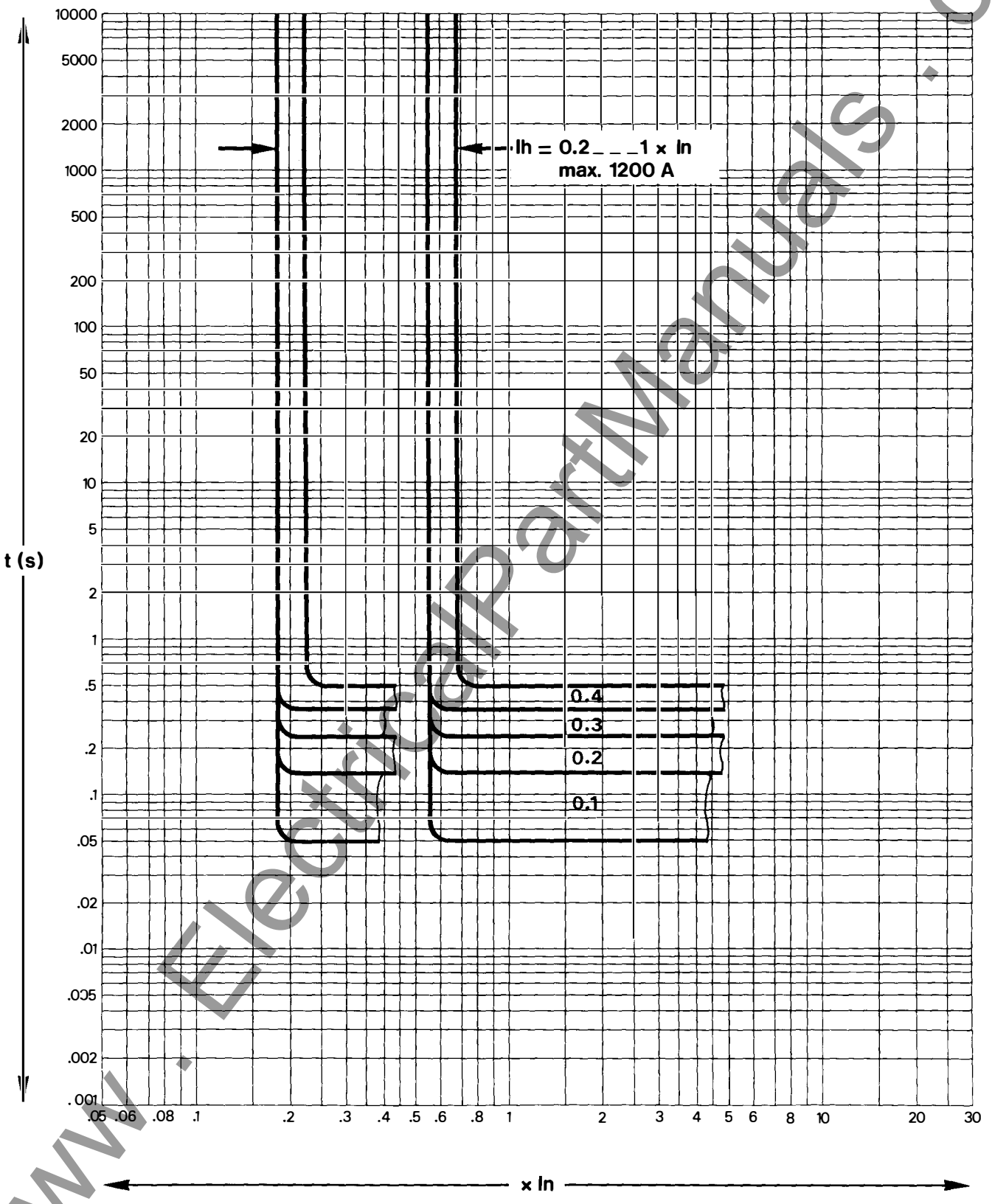


In current rating of sensor

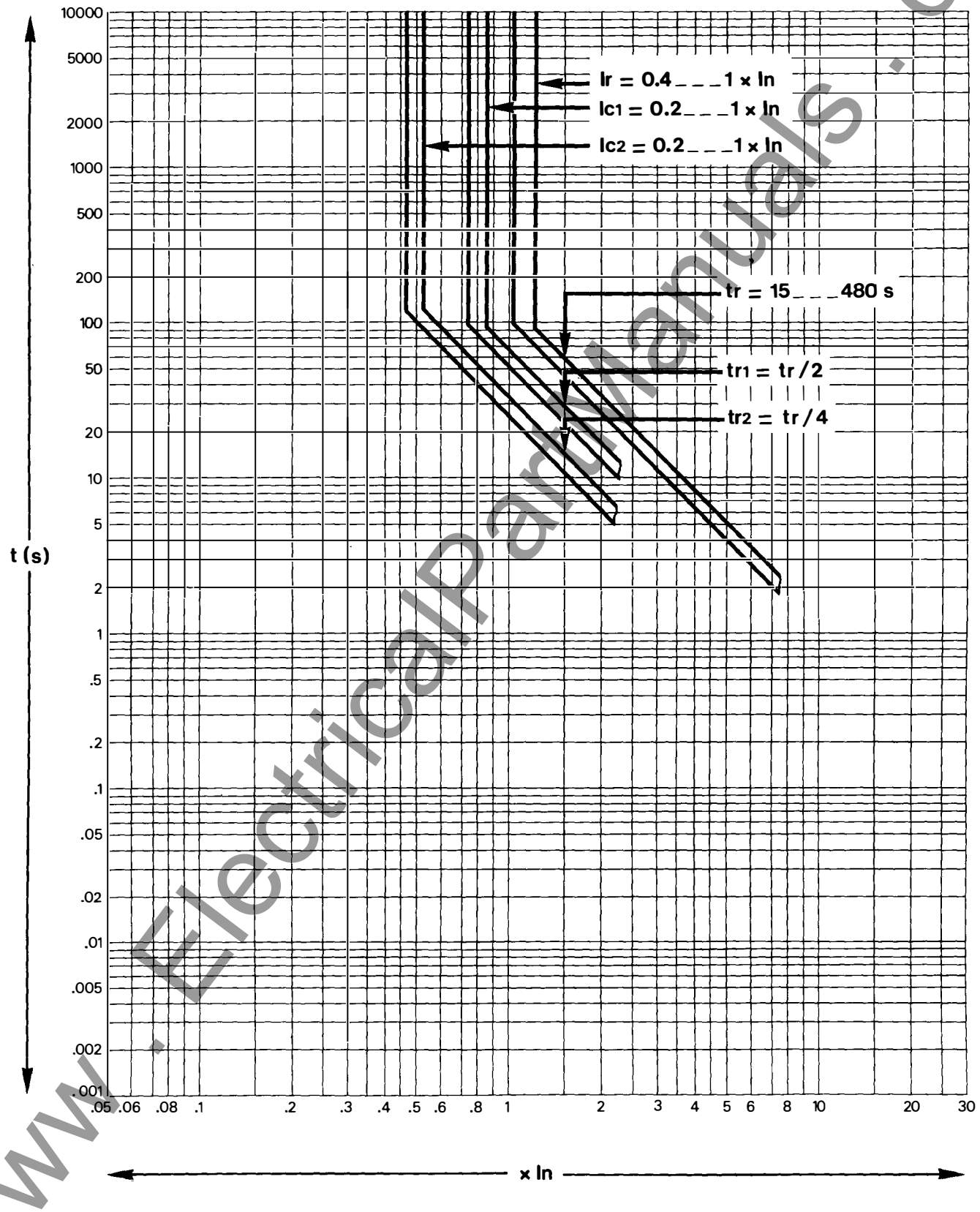
pick-up INST: from In to :

time/current characteristic curves
(cont.)

ST608U option T



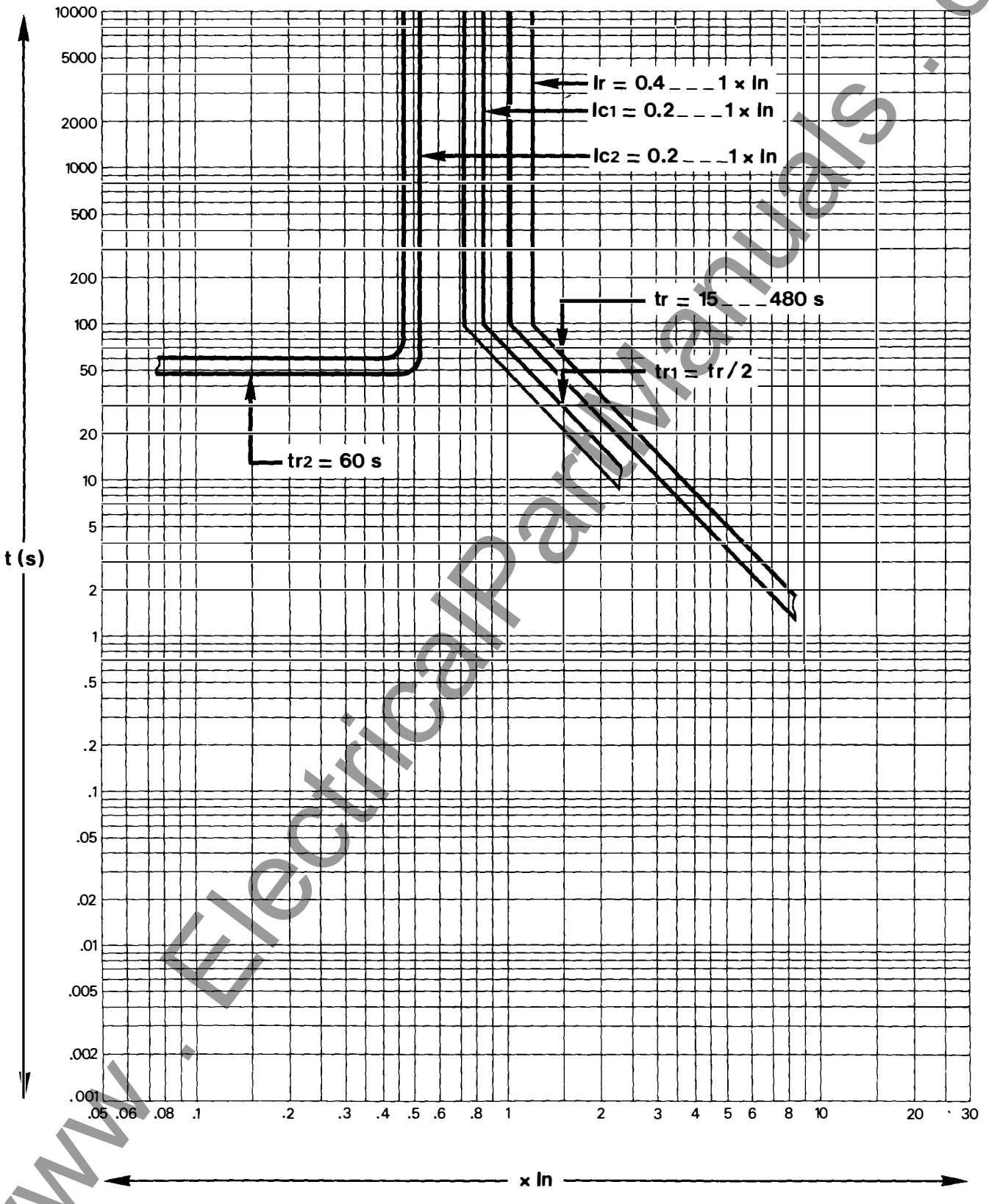
ST608U option M
load monitoring and control
2 loads limits



In current rating of sensor
Ir long time setting

time/current characteristic curves
(cont.)

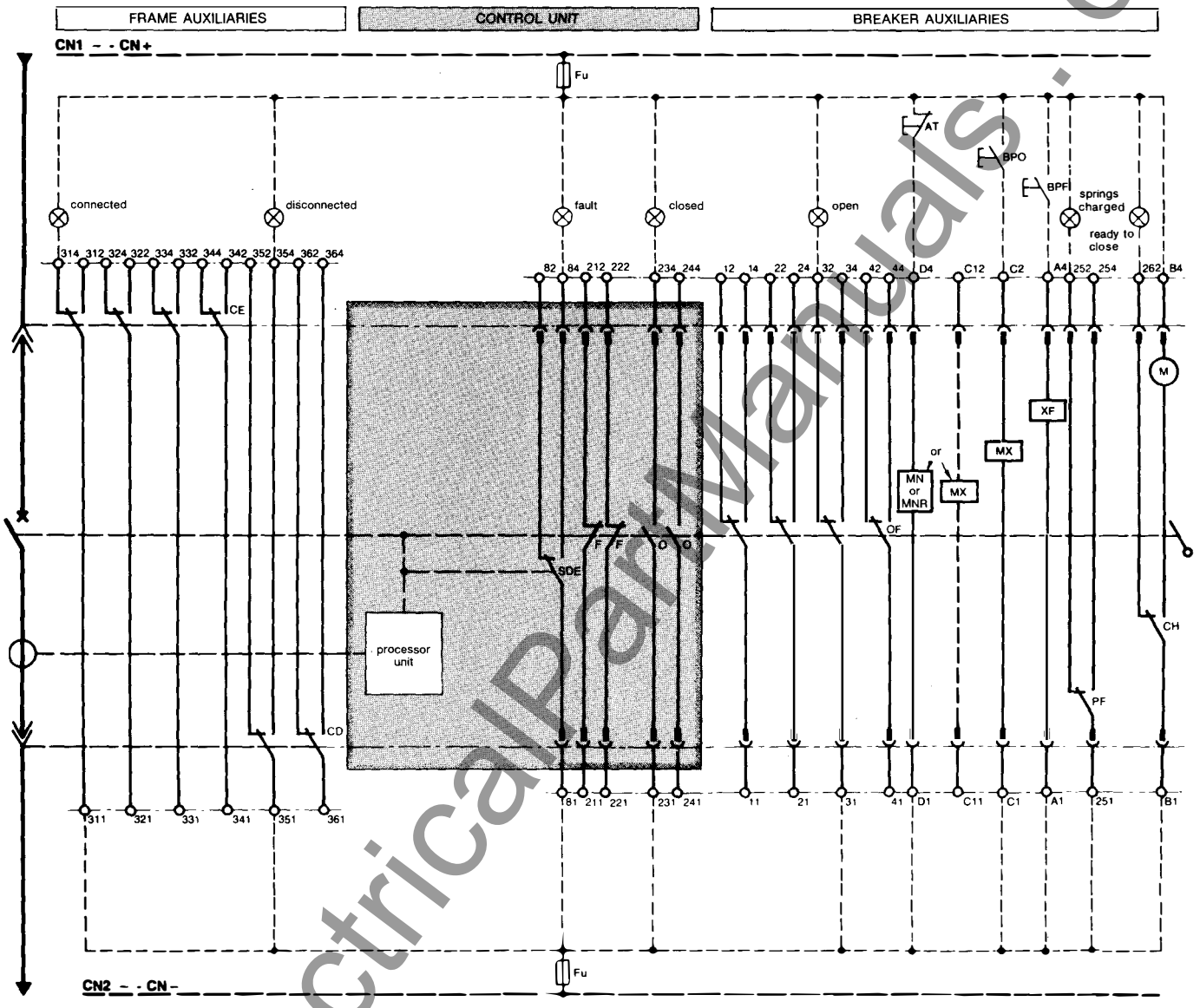
ST608U option M
load monitoring and control:
1 load limit
1 load reconnection pick-up



In current rating of sensor
Ir long time setting
(tr = time delay)

wiring diagrams

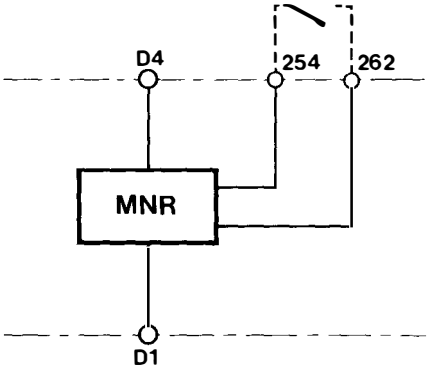
general diagram for basic version ST108/ST128/ST208/ST308/ ST318/ST408/ST418



AT: emergency off
BPO: « open » pushbutton
BPF: « close » pushbutton
CE: « connected » position contact (10 A, 240 V AC)
M: spring charging motor (180 VA, 240 V AC)
XF: closing release (20 VA, 240 V AC)
MX: shunt release (20 VA, 240 V AC)
MN: undervoltage release (20 VA, 240 V AC)
MNR: time delayed undervoltage release (20 VA, 240 V AC)
OF: auxiliary changeover contacts (10 A, 240 V AC)
O: 2 auxiliary NO contacts (10 A, 240 V AC)
SDE: fault trip indication contact (10 A, 240 V AC)
CH: charging motor limit switch contact
PF: « ready to close » contact (10 A, 240 V AC) (closing possible if breaker is open, not locked and operating mechanism charged)
CD: « disconnected » position contact (10 A, 240 V AC)

- diagram shown with circuits deenergised breaker open and in « connected » position, springs charged and relays in normal position,
- accessories such as pushbuttons, lamps and fuses are not supplied with the circuit breaker.

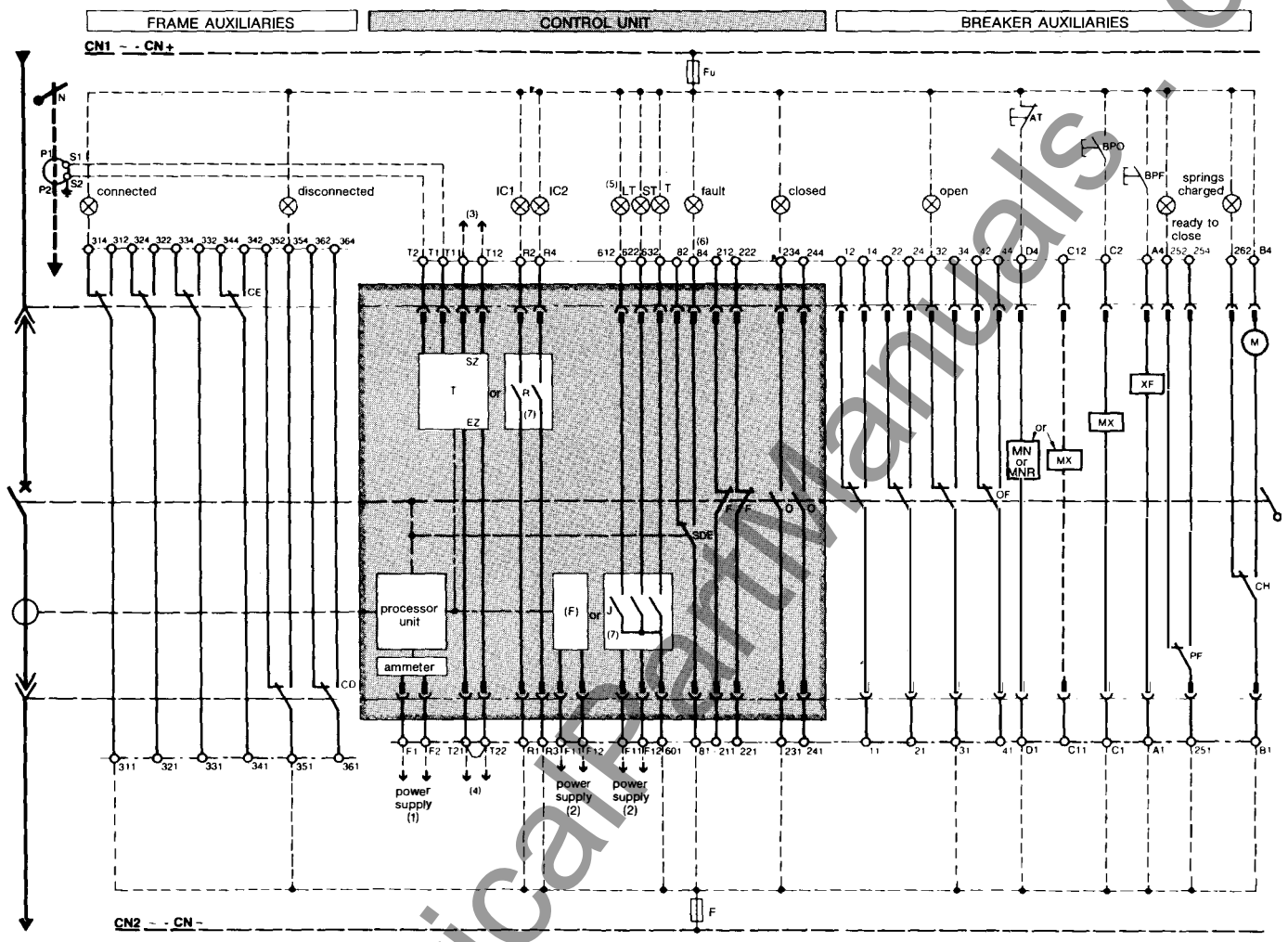
Wiring of the MNR (modified diagram). Instantaneous tripping with MNR.



Note: The wiring of the external contact replaces the spring charged indication and the contact PF.

wiring diagrams (cont.)

ST308/ST408/ST318/ST418 earth protection (T) or load monitoring and control local or remote indicators ammeter



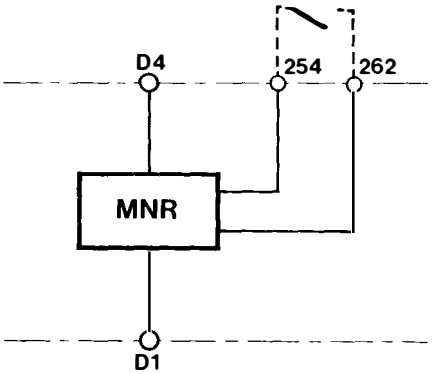
AT: emergency off
BPO: « open » pushbutton
BPF: « close » pushbutton
LR: long time trip (LT) indicating lamp
CR: short time trip (ST)indicating lamp
T: earth fault trip indicating lamp
CE: « connected » position contact (10 A, 240 V AC)
M: spring charging motor (180 V, 240 V AC)
R: load monitoring and control
XF: closing release (20 VA/240 V AC)
T: earth fault protection (EZ and SZ: input and output for zone selective interlocking)
MX: shunt release (20 VA, 240 V AC)
MN: undervoltage release (20 VA, 240 V AC)
MNR: time delayed undervoltage release (20 VA, 240 V AC)
OF: auxiliary changeover contacts (10 A/240 V AC)
O: 2 auxiliary NC contacts (10 A/240 V AC)
F: 2 auxiliary NC contacts (10 A/240 V AC)
SDE: fault trip indication contact (10 A/240 V AC)
CH: charging motor limit switch contact
F: fault trip local indicator
J: fault trip local and remote indicator

CD: « disconnected » position contact (10 A, 240 V AC)
Ic1: load shedding command according to Ic1 setting
Ic2: load shedding command according to Ic2 setting

■ diagram shown with circuits deenergised breaker open and in « connected » position, springs charged and relays in normal position.
■ accessories such as pushbuttons, lamps and fuses are not supplied with the circuit breaker.

(1) ammeter power supply : connection possible on load side of breaker depending on network voltage.
(2) power supply F or J (voltage available see page 19).
(3) zone selective interlocking with line side breaker (remove the jumper).
(4) zone selective interlocking with load side breaker

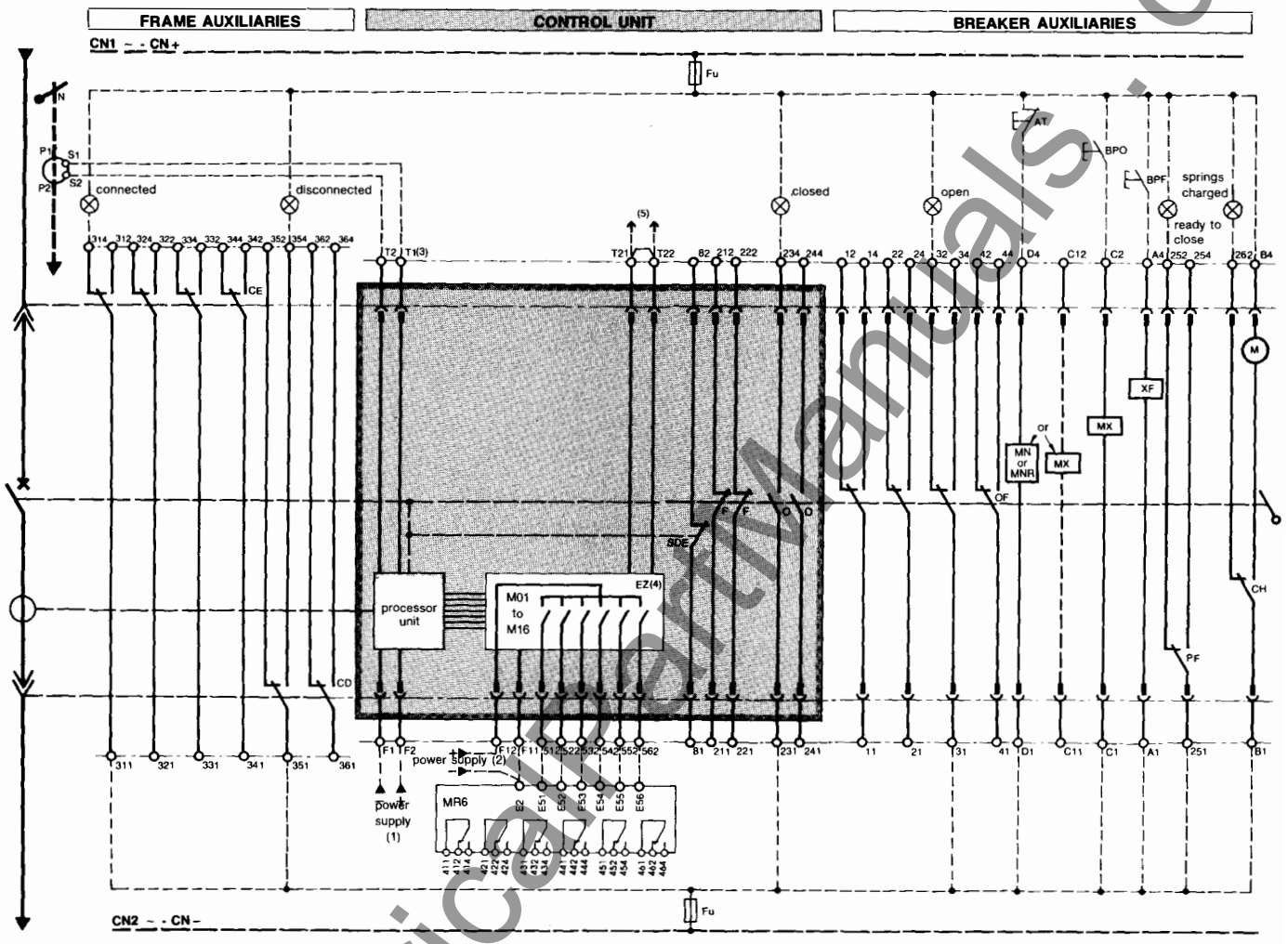
Wiring of the MNR (modified diagram) instantaneous tripping with MNR



Note: The wiring of the external contact replaces the spring charged indication and the contact PF

ST608UM (m01 to m32)
ST608UTM (m01 to m32)

see data transmission version (m17 to m32) on following page

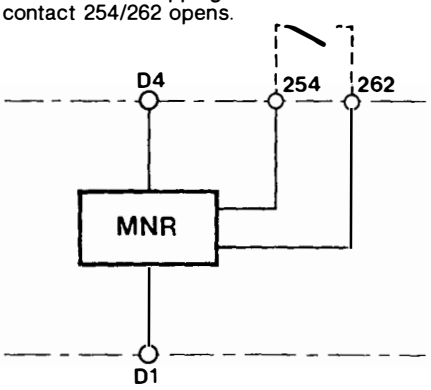


AT: emergency off
BPO: « open » pushbutton
BPF: « close » pushbutton
CE: « connected » position contact (10 A, 240 V AC)
M: spring charging motor (180 VA, 240 V AC
XF: closing release (20 VA, 240 V AC)
MX: shunt release (20 VA, 240 V AC)
MN: undervoltage release (20 VA, 240 V AC)
MNR: time delayed undervoltage release (20 VA, 240 V AC)
OF: auxiliary changeover contacts (10 A, 220 V AC)
O: 2 auxiliary NO contacts (10 A, 240 V AC)
F: 2 auxiliary NC contacts (10 A, 240 V AC)
SDE: fault trip indication contact (10 A, 240 V AC)
CH: charging motor limit switch contact
m01 to m16: indication option equipped with 6 opto-decoupled outputs to contacts (0.2 A, 24 V DC) for programming as per table on page 66 (EZ: input for earth fault protection zone selective interlocking)
PF: « ready to close » contact (10 A, 240 V AC) (closing possible if breaker is open, not locked and operating mechanism charged)

■ diagram shown with circuits deenergised, breaker open and in « connected » position, springs charged and relays in normal position.
■ accessories such as pushbuttons, lamps and fuses are not supplied with the circuit breaker.

(1) power supply for control unit and modules, see page 19.
(2) power supply for option M and module MR6 by module AD, see page 22 and 50.
(3) terminals T1 and T2 must always be shorted if

Wiring of the MNR (modified diagram). Instantaneous tripping with MNR when contact 254/262 opens.



Note: The wiring of the external contact replaces the spring charged indication and contact PF.

wiring diagrams (cont.)

ST608UM (m01 to m32)
ST608UTM (m01 to m32)

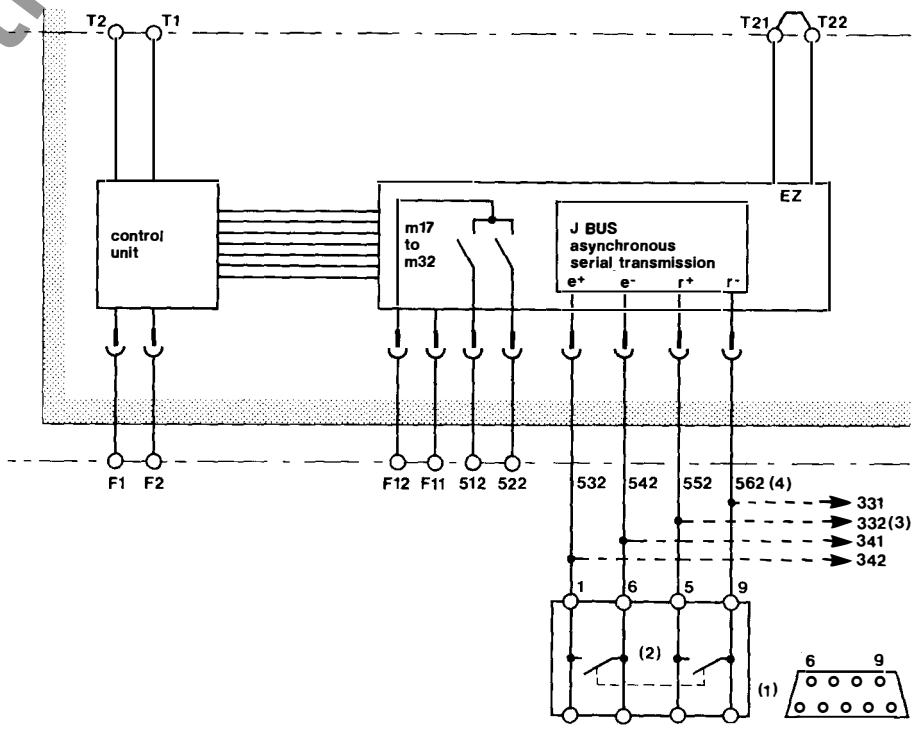
	module	terminal number					
		512	522	532	542	552	562
relay	basic version m01	LT	ST/Inst.		AS		
	other versions m02	LT	ST/Inst.	limit 1	limit 2	shed 1	shed 2
	m03	LT	ST/Inst.	limit 1	limit 2	shed 1	shed 2
	m04	LT	ST/Inst.	limit 1	AS	shed 1	shed 2
	m05	limit 2	ST/Inst.	limit 1	AS	shed 1	shed 2
	m06	LT	ST/Inst.	limit 1	AS	shed 1	shed 2
	m07	LT	ST/Inst.	T	limit 1	shed 1	shed 2
	m08	LT	ST/Inst.	T	AS	limit 1	Z
	m09	LT	ST/Inst.	T	AS	shed 1	shed 2
	m10	LT	ST/Inst.	T	Z	shed 1	shed 2
	m11	LT	ST/Inst.	T	limit 1	shed 1	shed 2
	m12	LT	ST/Inst.	T	Z	shed 1	shed 2
	m13	limit 1	ST/Inst.	T	AS	shed 1	shed 2
	m14	limit 1	ST/Inst.	T	Z	shed 1	shed 2
	m15	Z	ST/Inst.	T	AS	shed 1	shed 2
	m16						
		512	522	1	6	5	9
transmission reception outputs	m17	ST/Inst.	LT	e+ input	data transmission e− output	s+ input	s− output
	m18	ST/Inst.	AS				
	m19	T	ST/Inst.				
	m20	T	AS				
	m21	T	Z				
	m22	Z	AS				
	m23	Z	limit 1				
	m24	Z	shed 1				
	m25	T	shed 1				
	m26	ST/Inst.	limit 1				
	m27	ST/Inst.	shed 1				
	m28	limit 2	limit 1				
	m29	shed 2	shed 1				
	m30	reconn. 2	shed 1				
	m31	shed 2	AS				
	m32						

protection:
LT long time trip indication
ST/Inst. short time or instantaneous trip indication
T earth fault trip indication
Z zone selective interlocking output

load monitoring and control:
limit 1 indication of Ic1 setting overrun
limt 2 indication of Ic2 setting overrun
shed 1 load shedding command according to Ic1 setting (limit 1)
shed 2 load shedding command according to Ic2 setting
reconn. 2 load reconnection command according to Ic 2 setting (limit 2)

self-monotoring:
AS indication of control unit fault or overtemperature

connection modifications for data transmission: options m17 to m32



(1) Canon 9-pin connector for data transmission supplied as standard for versions m17 m32.
(2) Manual switching for device disconnection without disturbing local area network.
(3) Automatic switching for device disconnection

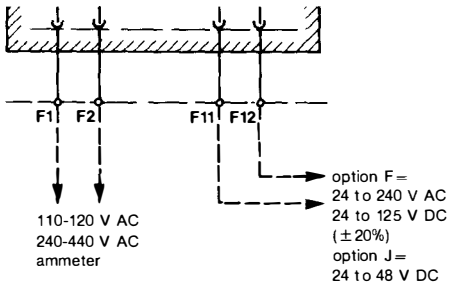
power supply

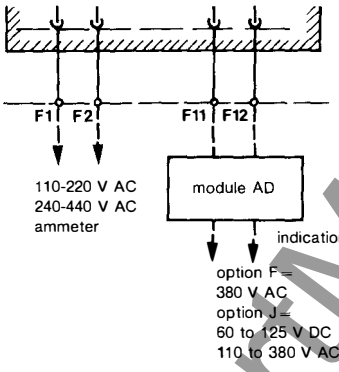
The diagrams below are complementary to those on pages 54 to 57 and represent the various control unit connection possibilities according to the voltages available in the installations.

Note: input voltage ranges are those specified in IEC 654.2 volume 71:
−20% +15%.
For module AD the DC range is ±20%.

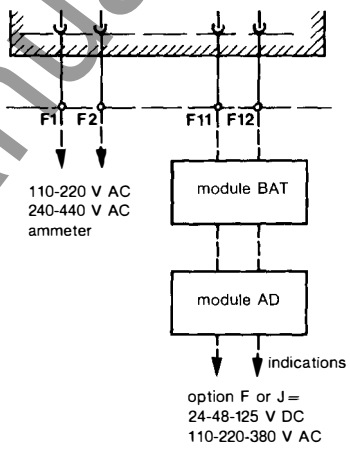
control units ST208, ST308/318, ST408/418

Standard power supply for ammeter and indications



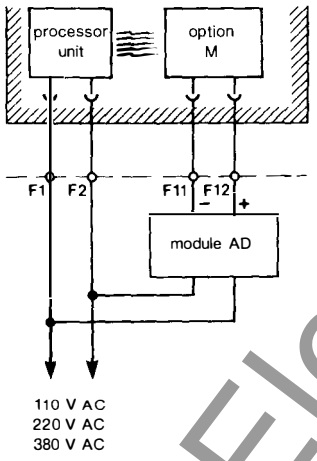


Power supply with data safeguard battery

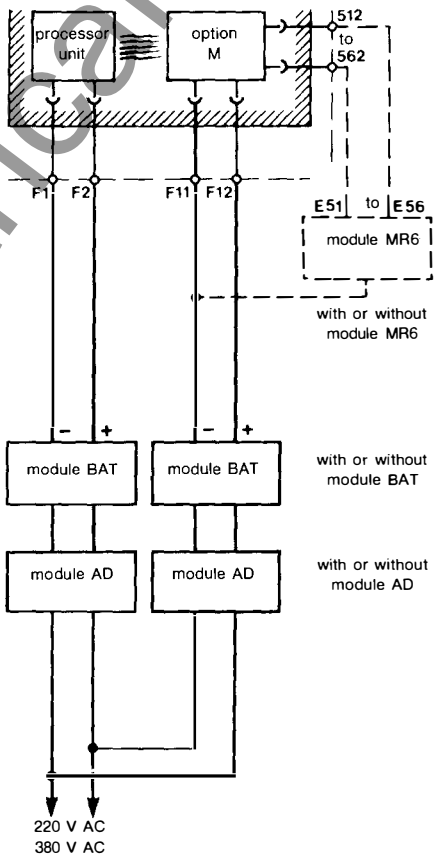


control unit ST608

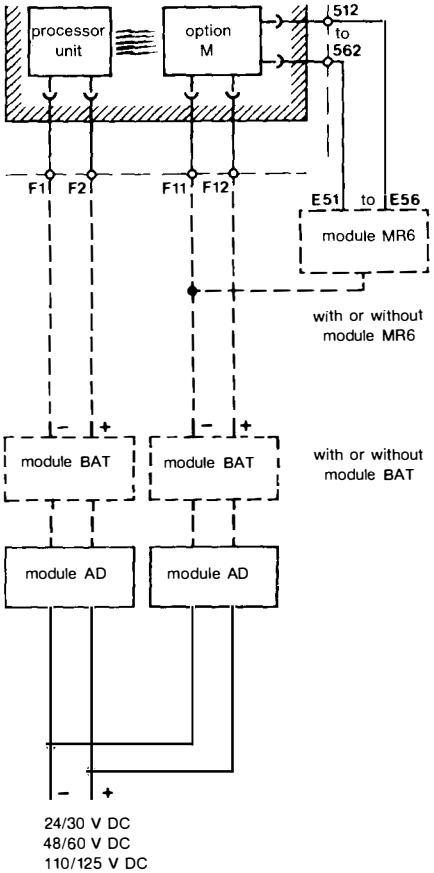
AC power supply
without data safeguard battery



AC power supply
with local and remote data safeguard battery



DC power supply
with or without local and remote data safeguard battery

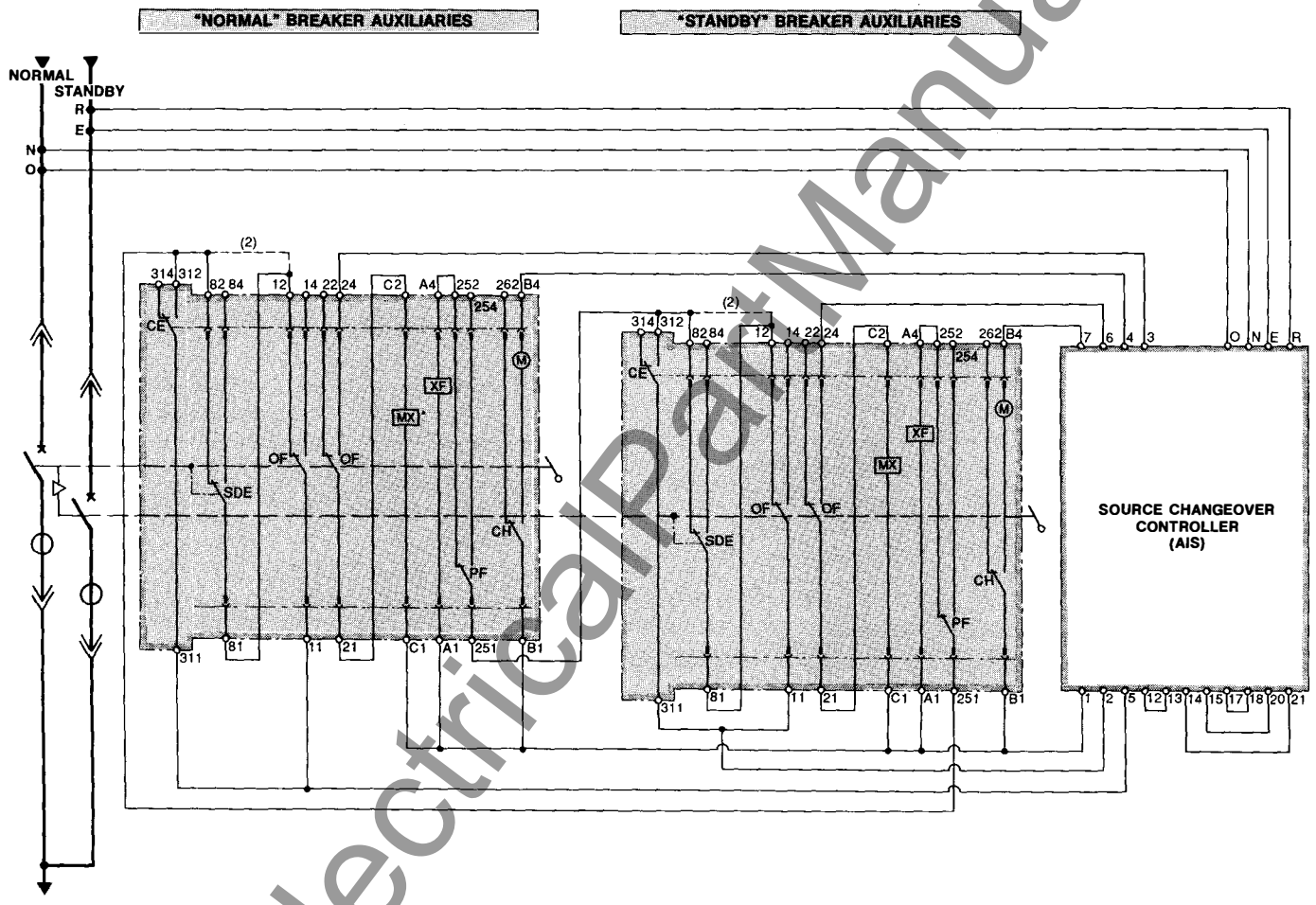


connection

Version represented:
with lockout after a fault (inoperative with automatic reset option). If lockout after a fault is not required, contact PF of the « normal » breaker must be connected directly in series with contact OF of the « standby » breaker and vice versa, without passing through the contact SDE.

Possible states

Normal	O	I	O
Standby	O	O	I

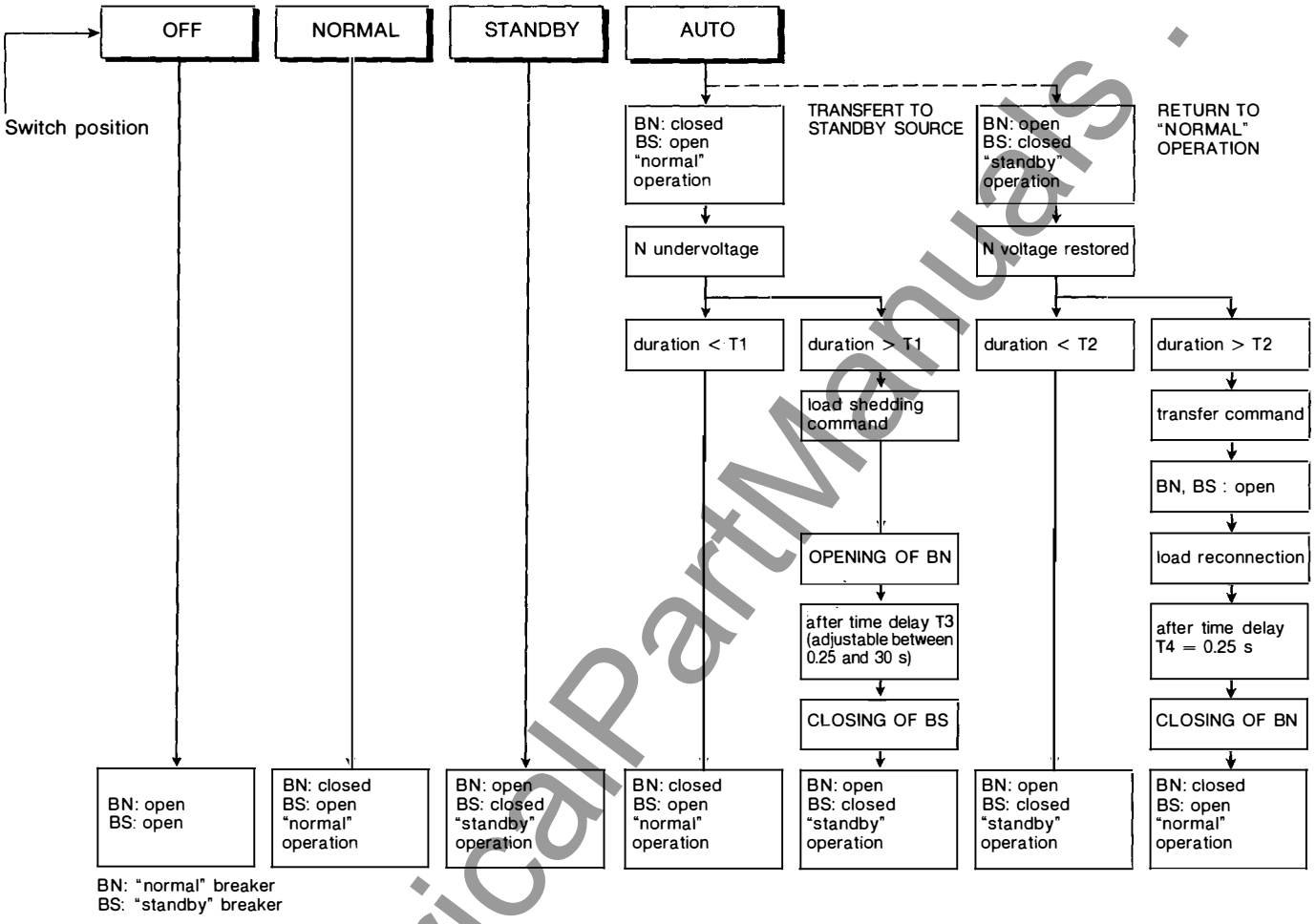


Note: all indications via O, F, OF, SDE, PF or CH should be protected by fuses which discriminate with respect to the controller protection devices so as to avoid unnecessary interruption of the source changeover system.

Diagram shown with circuits de-energised, breaker open and in « connected » position, springs charged and relays in normal position.

CE: « connected » position contact
M: spring charging motor
XF: closing release
MX: shunt release
OF: auxiliary changeover contact
SDE: overcurrent trip indication contact
CH: « springs charged » contact
PF: « ready to close » contact

operation

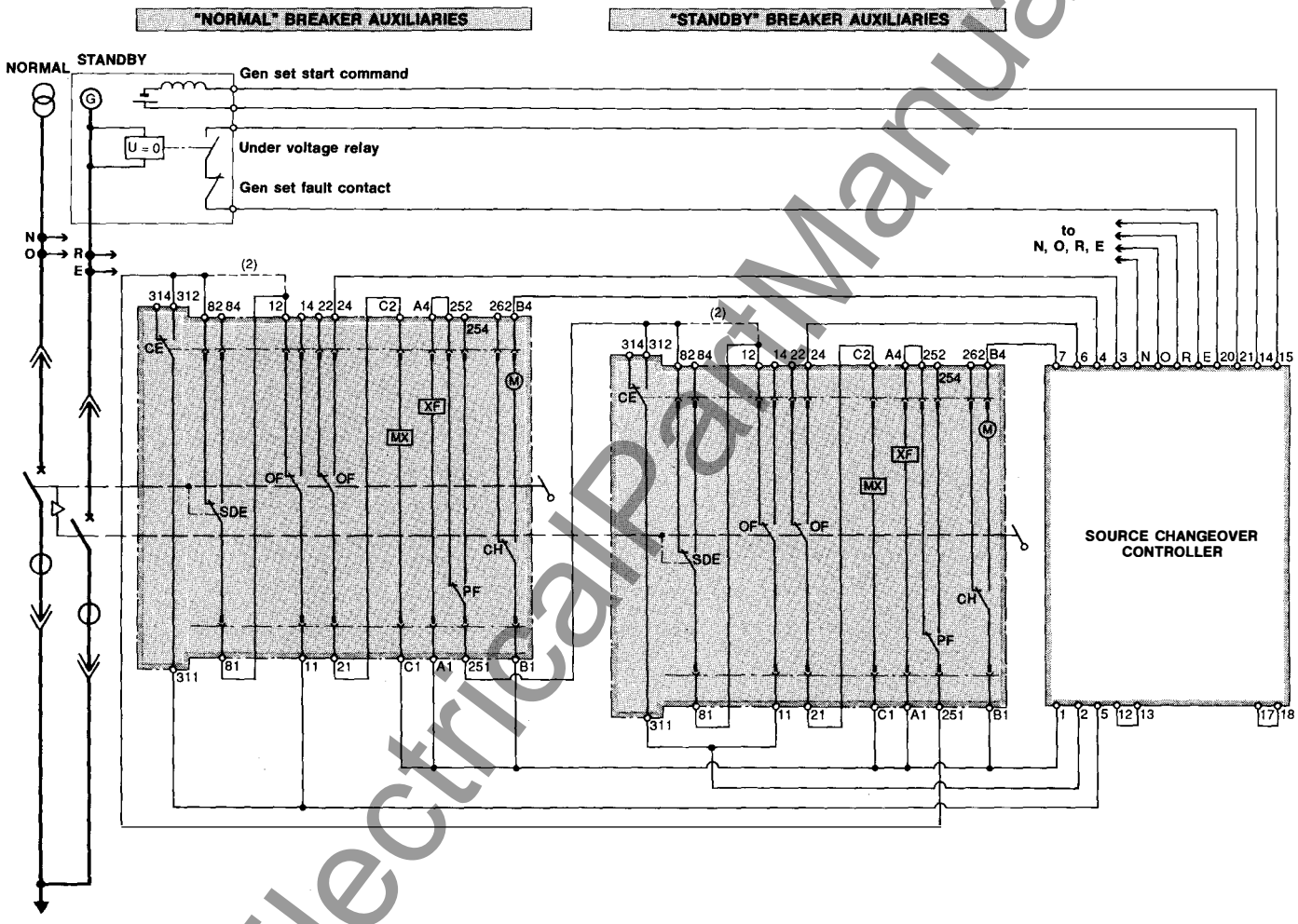


connection

Version represented:
with lockout after a fault (inoperative with automatic reset option). If lockout after a fault is not required, contact PF of the « normal » breaker must be connected directly in series with contact OF of the « standby » breaker and vice versa, without passing through the contact SDE.

Possible states

Normal	O	I	O
Standby	O	O	I

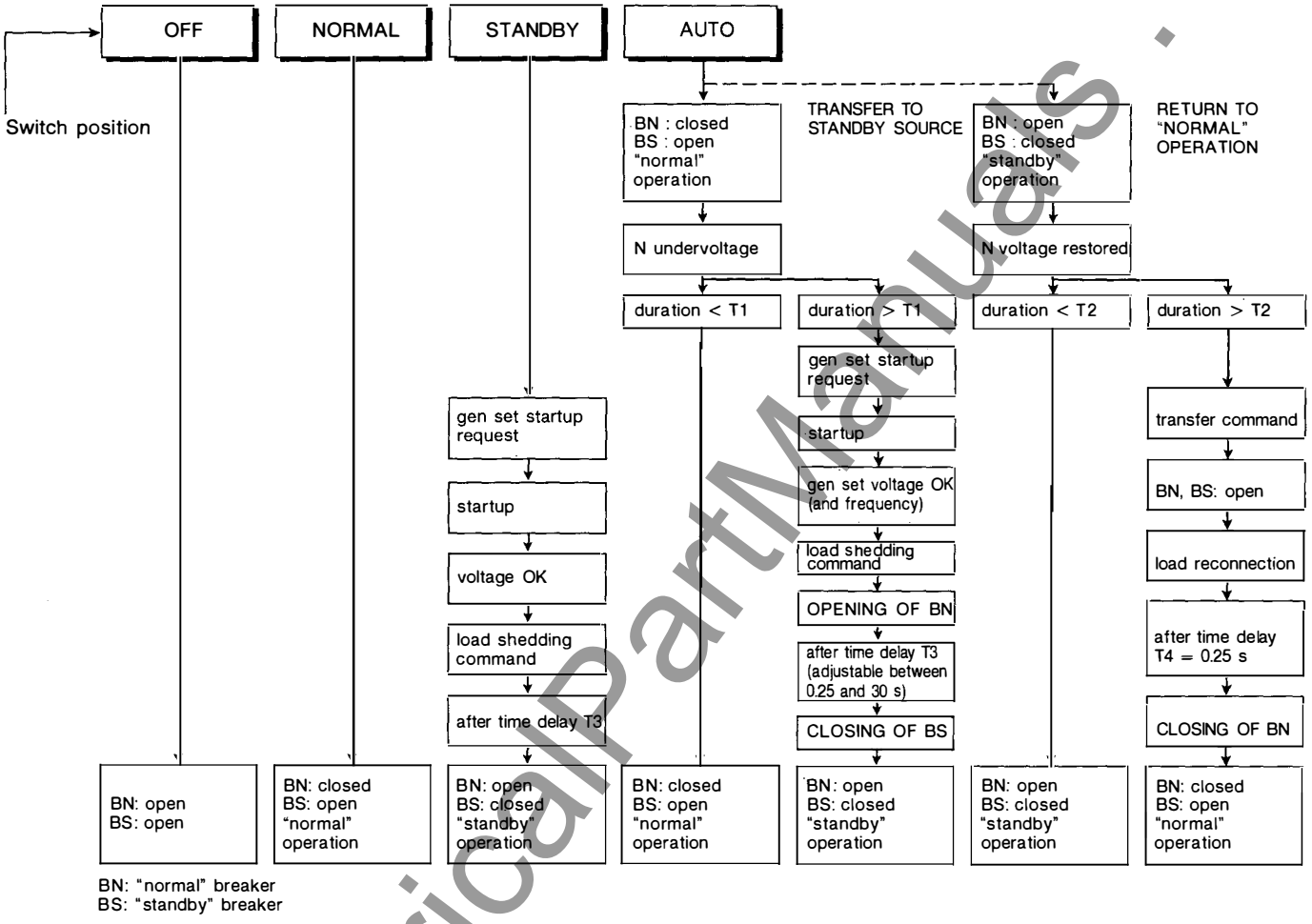


Note: all indications via O, F, OF, SDE, PF, or CH should be protected by fuses which discriminate with respect to the controller protection devices so as to avoid unnecessary interruption of the source changeover system.

Diagram shown with circuits de-energised, breaker open and in « connected » position, springs charged and relays in normal position.

CE: « connected » position contact
M: spring charging motor
XF: closing release
MX: shunt release
OF: auxiliary changeover contact
SDE: overcurrent trip indication contact
CH: « springs charged » contact
PF: « ready to close » contact

operation



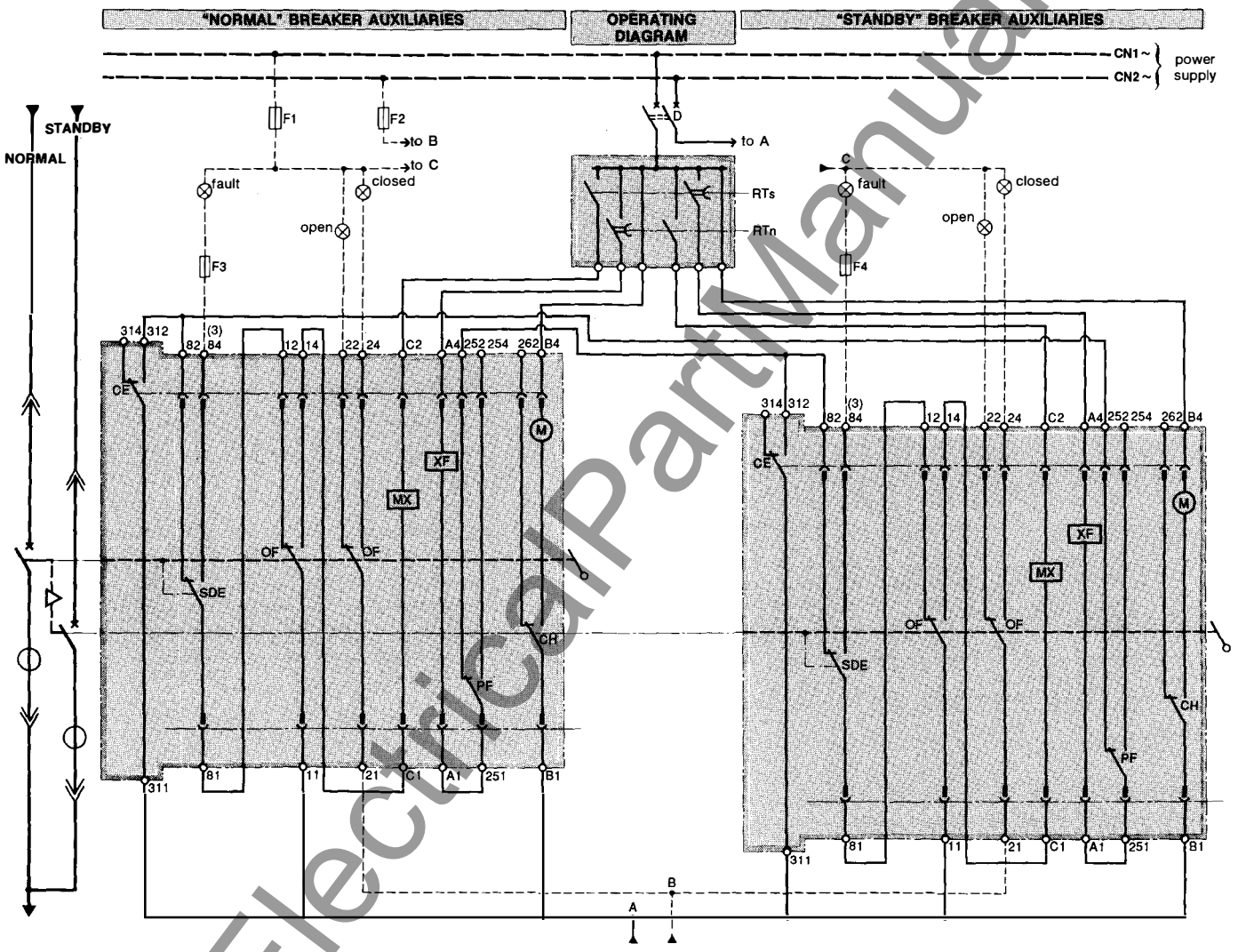
electrical interlock

Version represented:
with lockout after a fault. If lockout after a fault is not required, contact PF of the « normal » breaker must be connected directly in series with contact OF of the « standby » breaker and vice versa, without passing through the contact SDE.

The indication circuitry, shown in broken lines below, is optional. The accessories such as voltage relays, indicator lights and fuses are not included with the circuit breaker.

Possible states

Normal	O	I	O
Standby	O	O	I



Note: the fuses allow clearing of all faults occurring on the indications circuitry without interruption of the source changeover system.

Diagram shown with circuits de-energised, breaker open and in « connected » position, springs charged and relays in normal position.

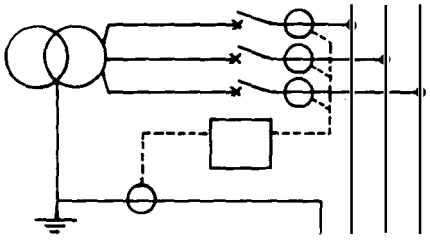
D: C32L circuit breaker (2 × 10 A)
F1, F2, F3, F4: protection fuses
RTs: voltage relay for « standby » source
RTn: voltage relay for « normal » source
CE: « connected » position contact
M: spring charging motor
XF: closing release
MX: shunt release
OF: auxiliary changeover contact
SDE: overcurrent trip indication contact
CH: « springs charged » contact
PF: « ready to close » contact

earth fault protection

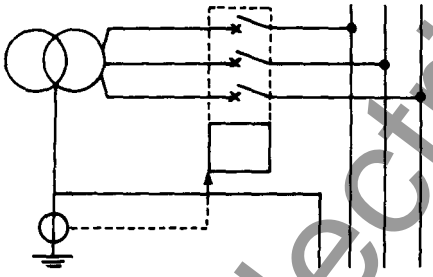
Masterpact air circuit breakers offer a range of earth fault protection, for directly earthed neutral (TN systems). Earth fault currents may well be limited to a few hundred amperes by the impedance of the fault path, due to arcing or for similar reasons. Such currents are not detected by the short circuit protection (pick up setting too high) and even when detected by the overload protection the tripping time is too long to prevent equipment damage, etc.

Masterpact offers the following protection:

1/ Residual current protection
The control unit calculates the vector sum of the sensor currents, including that of the neutral if distributed.
Note: The neutral sensor (ct) can be mounted externally from the breaker where a 3 pole device is used on a 4 wire system.



2/ Source ground return
The control unit measures the current of a single sensor installed separately from the circuit breaker on the conductor linking the transformer neutral to earth.



Zone Selective Interlocking on Earth Fault Protection
A « pilot wire » links several circuit breakers installed in a distribution scheme. In the event of an earth fault, tripping is instantaneous regardless of any time setting on the earth fault section of the control unit, except where a signal is received from a load side circuit breaker; under these conditions, the preset time delays hold.

opto-electronic outputs

Opto-electronic outputs are used on the control units to separate the internal electronic circuitry from the circuits wired by the installer.

data transmission

This is a « telephonic pair » link allowing data transmission and reception. A series type 20 mA current loop is used. JBUS type protocol is employed, compatible with Merlin Gerin programmable controllers.
Capacity: 255 devices.
Transmission rate: 300 bauds.

order form

For faster order processing, please use the following order form.
For each section, tick the box or indicate the value corresponding to your choice.

1. circuit breaker

■ **quantity**

■ **rating** (08...63)

■ **type (N H L ...)**

■ **number of poles**

■ **sensor rating**

IN	
TCE	

■ **version**

fixed	F	
complete drawout	D	
drawout - moving portion only	A	
drawout - fixed portion only	C	

■ **breaker connections**

top	horizontal	P	
	vertical	C	
	front	A	
bottom	horizontal	P	
	vertical	C	
	front	A	

■ **neutral protection**

None	
N	
N/2	

■ **environment**

standard T2 tropicalisation		
special conditions		

2. control unit

■ **instantaneous protection**

	ST108	
	ST128	
	ST208D	
ammeter	I	
power supply 110/220 or 240/440 V AC	direct	

■ **selective protection**

	ST308S	
	ST318S	
	ST308L	
	ST408S	
	ST418S	
ammeter	I	
power supply 110/220 or 240/440 V AC	direct	

■ **earth fault protection:**

residual	TF		TJ	
residual with zone selective interlocking	ZF		ZJ	
source ground return	WF		WJ	

load monitoring and control	RF	RJ	

fault indications

on front face	F	
on front face and via remote output	J	
power supply 24/220 V DC-AC	direct	
380 V AC	AD	
data safeguard battery	BAT	

■ **universal protection**

	ST608U	
power supply 110/220/380 V AC	direct	
24/30 48/60 125 V DC	AD	
data safeguard battery	BAT	
service continuity	YES	NO
module type	M	

earth fault protection	
residual	
source ground return	

■ **control unit accessories**

relay module for 3 A output	MR6	
support accessory	ABM	
mini battery unit (simplified test kit)	BU	
calibration test kit	ME	
sealable cover	PB	

3. electrical auxiliaires

■ **manual operating mechanism** only

yes	

■ **electrical operating mechanism**

geared motor	MCH	
operation counter	CDM	
closing release	XF	
voltage release (specify below)		

■ **voltage releases**

shunt release	MX	
instantaneous undervoltage release	MN	
time delayed undervoltage release	MNR	
with instant wiring	MNRI	

■ **indicating contacts**

4 changeover switches	OF	
24 additional changeover switches	OFSUP	
automatic reset	RAR	
« ready to close » contact	PF	
4 connected position switches	CE	
2 disconnected position switches	CD	
test position switch	CT	

■ **auxiliary connection accessories**

disconnectable plugs (1 or 2)	DP	
additional terminal block	BS	

4. mechanical and installation accessories

■ **pushbutton locking device**

VBP	

■ **« off » position lock**

VSPA1		VSPA2		VSPAC	
VSRA1		VSRA2		VSRAC	
VSCA		VSKA			

■ **« disconnected » position lock**

VSPC1		VSPC2		2VSPC1	
VSPCC		VSRC1		VSRC2	
2VSRC1		VSRCC		VSCC	
VSKC		VSTC			

■ **« disconnected-connected-test » positions lock**

VEC		VSEPC		2VSEPC	
VSERC		2VSERC		VSECC	
VSEKC					

■ **installation accessories**

righthand door lock	VPECD	
lefthand door lock	VPECG	
racking interlock	VPOC	
withdrawal/spring charged interlock	VEAA	
safety shutters	VO	
shutter lock (1 or 2)	VVC	
arc chute cover	CC	
terminal shield	CB	
interphase barrier	EIP	
partitioning fixture	AC	
door frame	CDP	
door frame with transparent cover	CCP	
breaker mismatch protection	VDC	

5. manual and automatic source changeover

■ **separate components**

	fixed/mixed		drawout	
mechanical interlock	VM2FT		VM2CT	
	VM2FC		VM2CC	
	VM33FT		VM33CT	
	VM32FT		VM32CT	
	VM31FT		VM31CT	

automatic changeover controller	AIS240C60H		AIS380C	
	AIS415C		AIS240C50H	
diagram no.				

■ **complete assemblies**

	fixed/mixed	drawout
2 breakers alone		
2 breakers with controller		
diagram no.(1)		
controller voltage		
position	down	up
standby		

	fixed/mixed		drawout	
3 breakers alone				
diagram no.(1)				
mechanical interlock	VM33FT		VM33CT	
	VM32FT		VM32CT	
	VM31FT		VM31CT	
position				

LV air circuit breaker
disjoncteur
Masterpact

contents
sommaire

Masterpact : Simplicity of installation

■ from 800A to 3200A in one physical size allows complete standardisation of cubicle metalwork.

■ unique design of arc chute cover obviates the need for safety clearance above the circuit breaker (drawout only).

■ all types of main circuit connection available.

■ all circuit breakers can be reverse fed without reduction in performance.

■ common door cutout for all the range

■ common fixing dimensions for all the range from 800 to 3200 A.

■ optimum use of switchboard space, up to 4 circuit breakers can be installed in a cubicle, one above the other.

Masterpact: un appareil facile à installer

■ *de 800 à 3200 A un seul encombrement qui permet la définition d'un "volume d'installation unique".*

■ *périmètre de sécurité réduit grâce au capot sur chambre.*

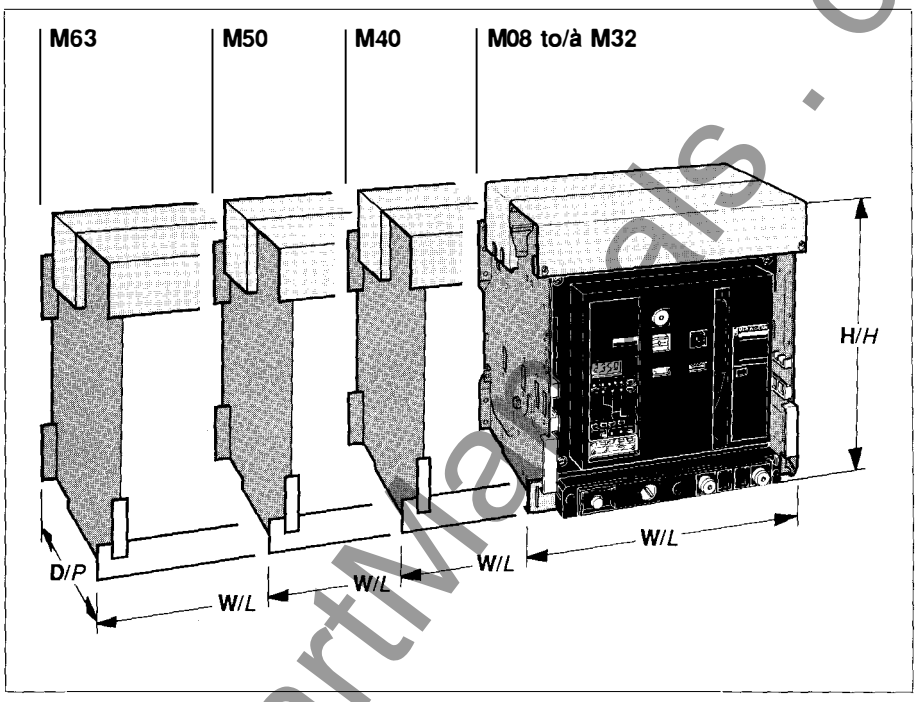
■ *des nouvelles possibilités de raccordements.*

■ *possibilité d'alimenter par les plages inférieures ou supérieures sans modifier les performances de l'appareil*

■ *découpe de porte unique pour toute la gamme.*

■ *points de fixation uniques pour la gamme de 800 à 3200 A .*

■ *optimisation des tableaux BT, possibilité d'installer jusqu'à 4 appareils dans une colonne.*



Dimensions (mm) excluding connections 3P drawout
Dimensions (mm) sans les raccordements 3P débrochable

	W / L	**H** / H	**D** / P
M08 to/à **M32**	435	439	367
M40	550	439	367
M50	815	484	367
M63	1045	484	367

common door cutout for fixed and drawout patterns

degree of protection

■ installed with front cover projecting through a cubicle door : IP 20. Protection against bodies greater than 12 mm.

■ installed with front cover projecting through a cubicle door fitted with the door frame (CDP) : IP 405 . Protection against solid bodies greater than 1 mm.

■ installed with front cover projecting through a cubicle door fitted with the door frame and transparent cover (CCP) : IP 549. Protection against dust (no harmful deposits) and protection against hosing with water from all directions.

fixing the door frame and the transparent cover

■ the door frame is secured by 11 self tapping screws (ø : 4mm, lg : 9,5 mm), Drilling diameter 5 mm.

■ the transparent cover is hinged to a door frame and is equipped with a screw closure.

découpe de porte unique pour les versions fixe et débrochable

degré de protection de l'appareil installé

■ *appareil à travers porte : IP 20. Protection contre la pénétration de corps solides supérieurs à 12 mm.*

■ *appareil à travers porte avec cadre de porte (CDP) : IP 405. Protection contre la pénétration de corps solides supérieurs à 1 mm.*

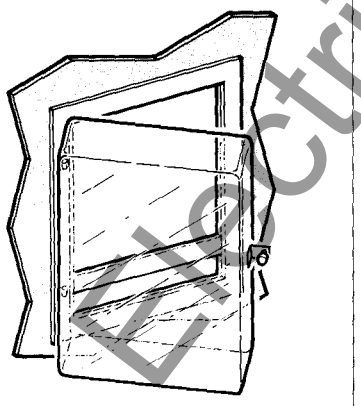
■ *appareil à travers porte avec capot transparent (CCP) : IP 549. Protection contre la pénétration de poussières (pas de dépôt nuisible) et les projections d'eau.*

fixation du cadre de porte et du capot transparent

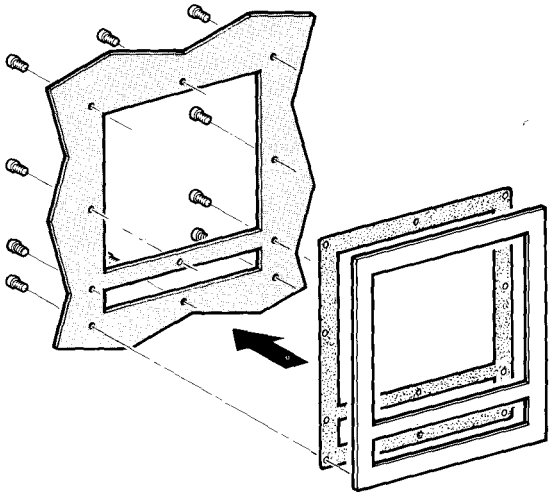
■ *le cadre de porte se fixe par 11 vis autotaraudeuses de diamètre 4 mm (lg = 9,5 mm), diamètre de perçage 5mm.*

■ *le capot transparent se fixe sur le cadre de porte. Il est équipé de 2 charnières et d'un dispositif de fermeture à vis.*

transparent cover
capot transparent



door frame
cadre de porte



interphase barrier (drawout pattern only) M08 to M40 3P

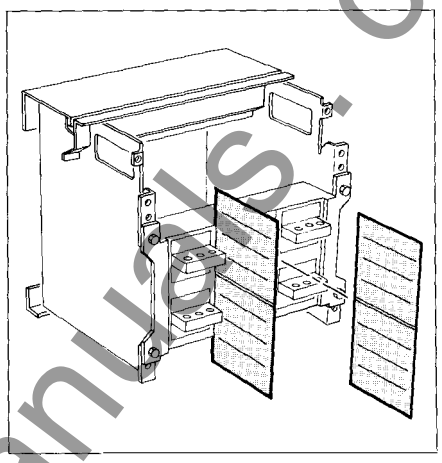
■ increases the length of the tracking path between phases.

■ reduces the risk of short circuits being caused by objects falling from above onto circuit breaker connections.

séparateurs de phases sur version débrochable M08 à M40 3P

■ *installation avec barres isolées : évite d'avoir à isoler les connexions de l'appareil.*

■ *installation avec barres non isolées permet d'éviter la propagation d'un arc né sur les barres vers le chassis.*



partitioning fixture (drawout pattern only)

■ the partitioning fixture is a kit comprising two lateral metal plates and one top metallic screen.

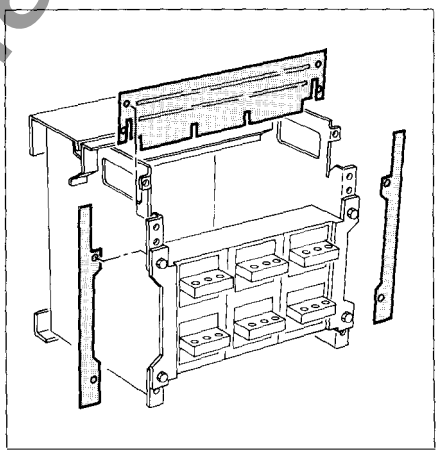
■ the partitioning fixture enables a compartmentalised switchboard to be fabricated with only a simple cutout to the rear of the circuit breaker (IP20).

adaptation de cloisonnement (Sur version débrochable uniquement)

■ *l'ensemble adaptation de cloisonnement est composé de deux plaques latérales et d'un écran supérieur.*

■ *pour un tableau cloisonné l'option adaptation de cloisonnement permet de simplifier la découpe du fond de la case disjoncteur.*

■ *degré de protection du cloisonnement ainsi réalisé : IP 20.*

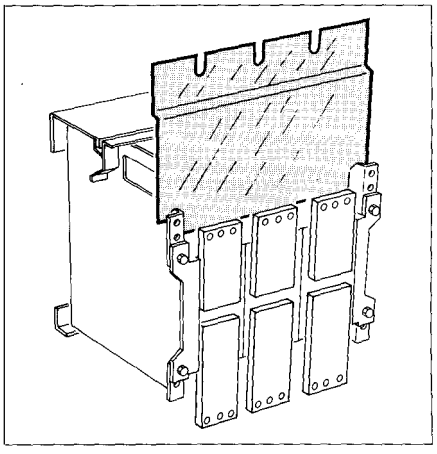


front connection screen

■ when a circuit breaker is installed with top front connections the insulated screen (supplied) must be fitted onto the upper part of the chassis (drawout) or circuit breaker (fixed).
Note : The arc chute cover cannot be fitted when top front connections are supplied.

écran pour prise avant

■ *pour respecter le périmètre de sécurité, l'utilisation d'un écran (fourni) est obligatoire dans le cas de raccordement supérieur de type prise avant.*
NB : Le capot sur chambre est incompatible avec les prise avant.



Dimensions and installation : interphase barrier, partitioning fixture, front connection

LV power air circuit breaker
disjoncteur BT forte intensité
Masterpact

all types of connection available to suit your needs

4 types of connections available :

- rear horizontal
- rear vertical
- front
- mixed

The main circuit terminals are solid and extremely robust allowing connection of busbars up to 20 mm thickness (except M40, M50, M63).
Note : Recommendations regarding size and number of busbars are detailed on pages 8 to 10.

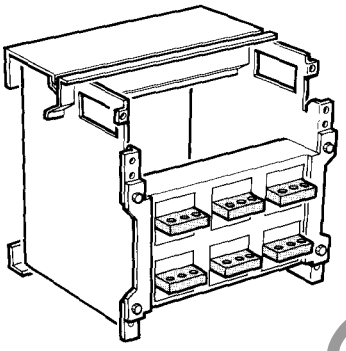
possibilités de raccordement adaptées à tous les besoins

4 types de raccordement :

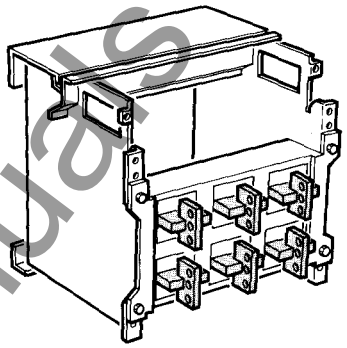
- *prise arrière à plat*
- *prise arrière sur chant*
- *prise avant*
- *prise mixte*

Les plages de raccordement sont massives. Il est ainsi possible de raccorder l'appareil avec des barres pouvant aller jusqu'à 20 mm d'épaisseur (sauf M40, M50, M63).
NB : Composition du raccordement de Masterpact : se reporter au tableau de choix des raccordements page 8 à 10.

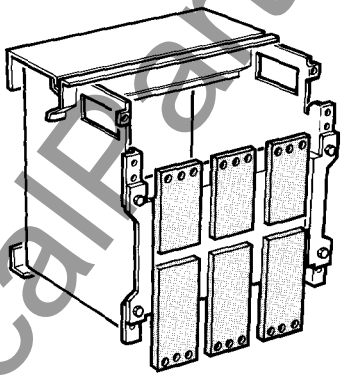
rear horizontal
prise arrière à plat



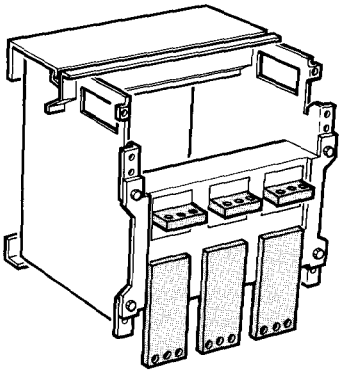
rear vertical
prise arrière sur chant



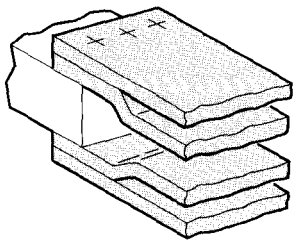
front
(screen compulsory)
prise avant
(écran obligatoire)

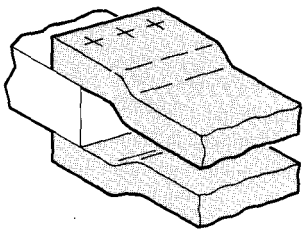


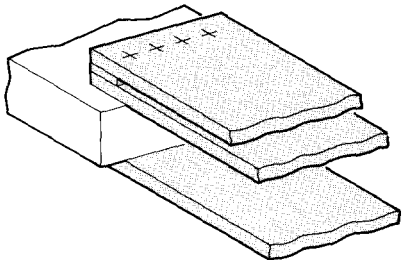
mixed
prise mixte

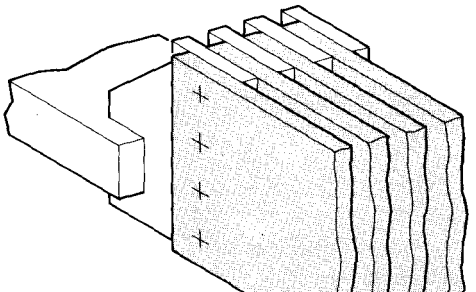


examples of possible connection configurations
exemples de réalisation de raccordement







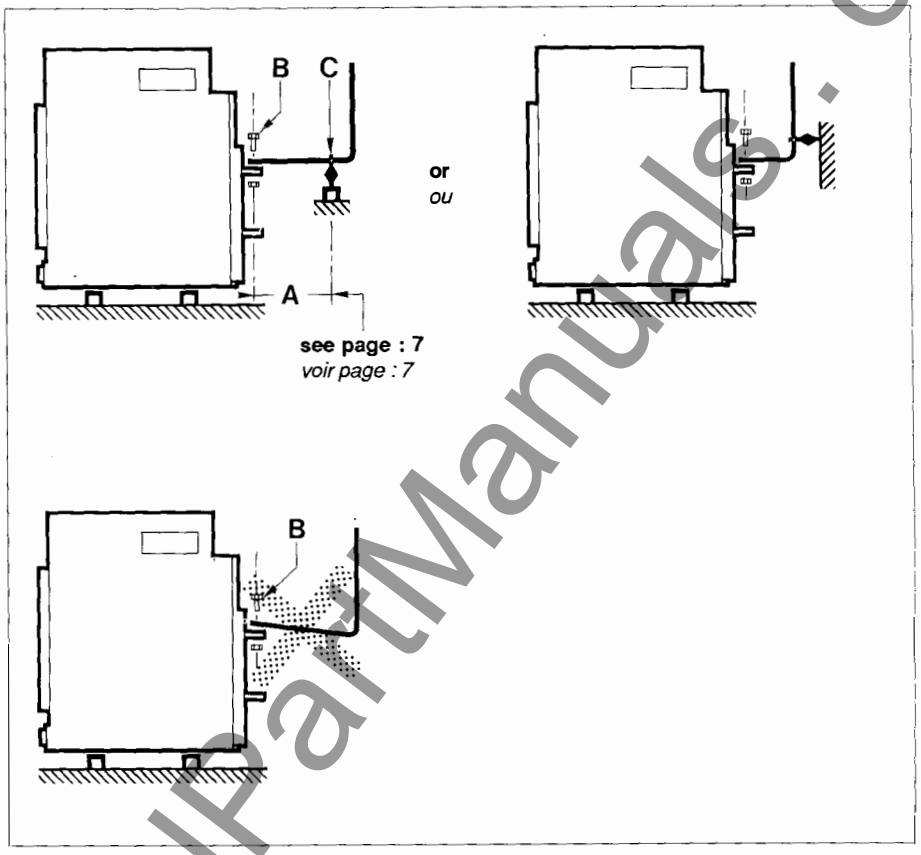


busbars connections

■ the busbars should be suitably adjusted to ensure that the connection points are positioned on the terminal pads before the bolts are inserted **B**.
■ the connections are held by the support which is solidly fixed to the framework of the board, such that the circuit breaker terminal pads do not have to support its weight **C**.
(This support should be placed close to the terminal pads : see table page 7).

raccordement des barres

■ *l'ajustage des barres sera réalisé avec une précision suffisante pour que les points de connexion se trouvent déjà convenablement positionnés sur les plages, avant la mise en place de la visserie **B**.*
■ *les connexions seront maintenues par un support solidement fixé à l'ossature du tableau, afin que les plages du disjoncteur n'en supportent pas le poids **C**. (Ce support sera placé à proximité des plages : voir tableau page 7).*



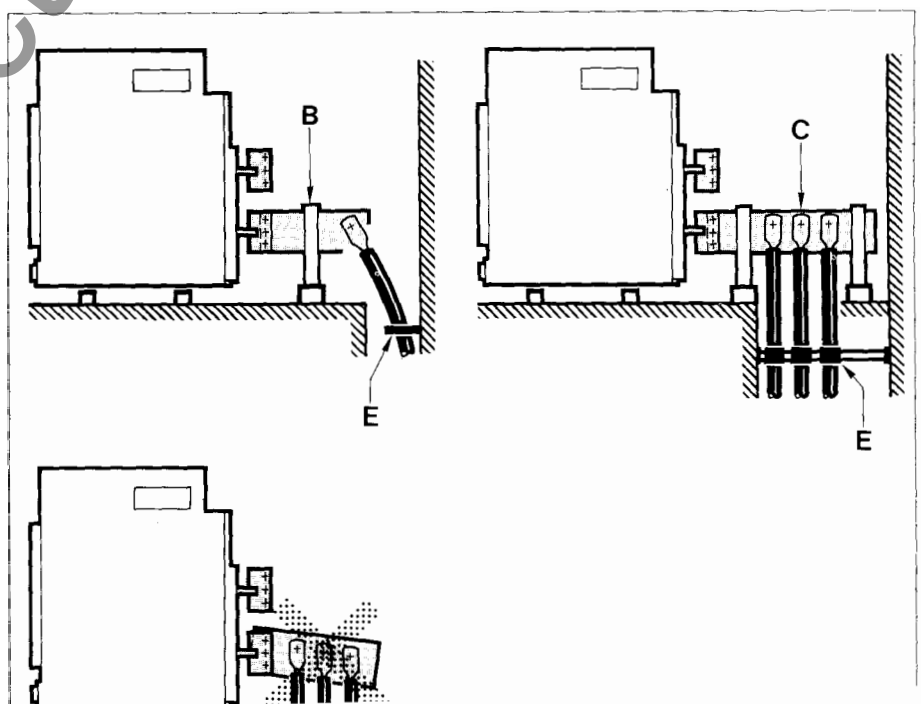
cable connections

If the link is in the form of cables, it is again essential to ensure that excessive mechanical stresses are not applied to the circuit breaker terminal pads. Vertical terminal pads are thus recommended, and they should be arranged as indicated below :
■ with busbar extensions whose selection, design and installation are identical to those used in links,
❑ if the circuit has only a single cable, use the method indicated in **B** for instance.
❑ if the circuit has several cables, prefer the solution indicated in **C**.
■ in all cases, follow the same general rules as for busbars :
❑ cable ends correctly positioned before the bolts are inserted.
❑ cables helds solidly and solidly fixed to the framework **E**.

raccordement des câbles

Dans le cas d'une liaison en câbles, la précaution essentielle consiste également à ne pas appliquer de contraintes mécaniques excessives sur les plages du disjoncteur.
Il est alors conseillé d'adopter des plages verticales, et de les aménager l'installation sont identiques aux connexions de liaison,
❑ *si le circuit ne comporte qu'un seul câble, adopter par exemple la solution indiquée en **B**.*
❑ *si le circuit comporte plusieurs câbles, adopter plutôt la solution indiquée en **C**.*

■ *dans tous les cas, respecter les mêmes règles générales que pour les barres, soit :*
❑ *extrêmités de câbles correctement positionnées avant mise en place de la visserie.*
❑ *câbles solidarisés, et solidement fixés à l'ossature **E**.*



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disjoncteur BT forte intensité
Masterpact

electrodynamic stresses

■ the first busbar support or spacer shall be situated at a maximum distance from the connection point of the breaker (see table below).

■ this distance must be maintained to allow the electrodynamic stresses between phases to be withstood in the event of a short circuit.

maximum distance between busbar to circuit breaker connection and the first busbar support or spacer with respect to the value of prospective short circuit current.
distance maximum entre raccordement disjoncteur et premier entretoisement des barres à respecter en fonction de la valeur du court-circuit.

Isc (kAms) *Icc (kAeff)*	30	50	65	80	100	150
distance (mm) *distance (mm)*	350	300	250	200	150	150

efforts électrodynamiques

■ *le premier entretoisement des barres devra être situé à une distance maximum du point de raccordement de l'appareil.*

■ *cette distance doit être respectée afin de supporter les efforts électrodynamiques qui s'appliquent entre les barres de chaque phase lors d'un court-circuit.*

clamping

■ correct clamping of busbars depends amongst other things, on the tightening torques used for locking the nuts and bolts. To great a tightening may result in the same difficulties as insufficient tightening.

For connecting busbars to the circuit breaker, the tightening torques to be used are shown in the table opposite (1). These values are for use with copper busbars (2), and for steel nuts and bolts, class 8.8.

tightening torques (1)
couples de serrage (1)

Ø nominal *nominal* **(mm)**	**Ø drilling** *perçage* **(mm)**	**tightening torque (m.daN) with washers :** *couple de serrage (m.daN) avec rondelles :* **grower or flat** *plates ou grower*	**contact or corrugatec** *contact ou éventail*
10	11	3,75	5

(2) use the same torque values for aluminium busbars on quality AGS-T52 (French Standard NFA 02-104 and American National Standard H-35-1).
utiliser les mêmes valeurs de couple pour des barres aluminium de qualité AGS-T52 (norme Française NFA 02-104 et American National Standard H-35-1).

éclissages

■ *la qualité des éclissages de barres dépend, entre autres, des couples de serrage adoptés pour le blocage de la visserie. En effet, un excès de serrage peut avoir les mêmes inconvénients qu'un serrage insuffisant.*

Pour le raccordement des barres sur le disjoncteur, les valeurs des couples de serrage à respecter sont indiquées dans le tableau ci-contre (1).

Ces valeurs sont liées à l'utilisation de barres de cuivre (2), et s'entendent pour de la visserie acier classe 8.8.

bending busbars

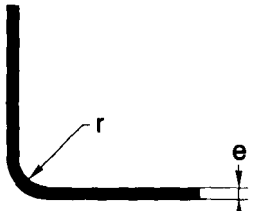
■ when bending busbars maintain the radius indicated opposite (a smaller radius would cause cracks).

pliage des barres

■ *réaliser le pliage des barres en respectant les rayons de courbure*

radius of curvature
rayon de courbure

e (mm)	**radius of curvature r** *rayon de courbure r* **mini** *mini*	**recommended** *conseillé*
5	5	7,5
10	15	18 **to**/*à* 20



busbar connections selection chart

Note : the values indicated in these tables have been extrapolated from test data. These tables can only act as a guide and cannot replace industrial experience or a temperature rise test.

basis of tables :

- maximum permissible busbar temperature : 100°C.
- temperature inside the switchboard around the circuit breaker and its connections : Ta.
- busbar material is high conductivity copper.

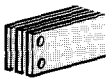
tableau de choix des raccordements

Avertissement : les valeurs données sont le fruit d'essais et de calculs théoriques effectués à partir des paramètres cités ci-après. Ces tables peuvent constituer un guide pour la conception d'un raccordement mais ne sauraient remplacer l'expérience acquise sur un type de raccordement ni éviter des essais de vérifications.

paramètres d'établissement des tables :

- *température maximale admissible des barres : 100°C.*
- *température dans le tableau autour du disjoncteur et de ses raccordements : Ta.*
- *jeu de barres en cuivre.*

1. drawout breaker, vertical connections
appareil débrochable, barres sur chant



maximum service current *intensité maximale véhiculée*	T_a = 40°C			T_a = 50°C			T_a = 60°C		
	Masterpact	no. of bars *nbr. de barres* thick of 5 *larg. de 5*	thick of 10 *larg. de 10*	Masterpact	no. of bars *nbr. de barres* thick of 5 *larg. de 5*	thick of 10 *larg. de 10*	Masterpact	no. of bars *nbr. de barres* thick of 5 *larg. de 5*	thick of 10 *larg. de 10*
800	M08	2b.50 x 5	1b.50 x 10	M08	2b.50 x 5	1b.50 x 10	M08	2b.50 x 5	1b.50 x 10
1000	M10	2b.50 x 5	1b.50 x 10	M10	2b.50 x 5	1b.50 x 10	M10	2b.63 x 5	1b.63 x 10
1250	M12	2b.63 x 5	1b.63 x 10	M12	2b.63 x 5	1b.63 x 10	M12	3b.50 x 5	2b.50 x 10
1400	M16	2b.63 x 5	1b.63 x 10	M16	2b.63 x5	1b.63 x 10	M16	3b.50 x 5	2b.50 x 10
1600	M16	2b.80 x 5	1b.80 x 10	M16	2b.80 x5	1b.80 x 10	M20	3b.63 x 5	2b.50 x 10
1800	M20	2b.80 x 5	1b.80 x 10	M20	2b.80 x 5	2b.50 x 10	M20	3b.80 x 5	2b.63 x 10
2000	M20	2b.100 x 5	2b.63 x 10	M20	2b.100 x 5	2b.63 x 10	M25	3b.100 x 5	2b.80 x 10
2200	M25	2b.100 x 5	2b.63 x 10	M25	2b.100 x 5	2b.63 x 10	M25	3b.100 x 5	2b.80 x 10
2500	M25	4b.80 x 5	2b.80 x 10	M25	4b.80 x 5	2b.80 x 10	M32	4b.100 x 5	3b.80 x 10
2800	M32	4b.100 x 5	2b.100 x 10	M32	4b.100 x 5	2b.100 x 10	M32	4b.100 x 5	3b.80 x 10
3000	M32	5b.100 x 5	3b.80 x 10	M32	6b.100 x 5	3b.100 x 10	M40		3b.100 x 10
3200	M32	6b.100 x 5	3b.100 x 10	M40		3b.100 x 10	M40		4b.100 x 10
3600	M40		4b.100 x 10	M40		4b.100 x 10	M50		4b.100 x 10
4000	M40		4b.100 x 10	M50		4b.100 x 10	M50		5b.100 x 10
4700	M50		5b.100 x 10	M50		5b.100 x 10	M50		5b.100 x 10
5000	M50		5b.100 x 10	M50		5b.100 x 10	M63		6b.100 x 10
5100	M63		5b.100 x 10	M63		6b.100 x 10	M63		6b.100 x 10
5700	M63		6b.100 x 10	M63		6b.100 x 10			
6300	M63		6b.100 x 10						

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example :

data given :
- drawout circuit breaker
- horizontal connections
- ambient (around breaker) : T_a = 50°C
- service current : 1800A

solution :
Table 2 : for Ta = 50°C; use a M20 which can be connected with 3 bars of 80x5 or 2 bars of 63x10.

exemple :

données :
- *appareil débrochable*
- *jeu de barres à plat*
- *température : T_a = 50°C*
- *intensité de service : 1800A*

solution :
Dans le tableau 2 : pour T_a = 50°C; utiliser un M20 pouvant être raccordé soit avec 3 barres de 80x5 soit avec 2 barres de 63x10.

2. drawout breaker, horizontal connections
appareil débrochable, barres à plat

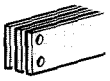
maximum service current *intensité maximale véhiculée*	T_a = 40°C			T_a = 50°C			T_a = 60°C		
	Masterpact	no. of bars *nbr. de barres* thick of 5 *larg. de 5*	thick of 10 *larg. de 10*	Masterpact	no. of bars *nbr. de barres* thick of 5 *larg. de 5*	thick of 10 *larg. de 10*	Masterpact	no. of bars *nbr. de barres* thick of 5 *larg. de 5*	thick of 10 *larg. de 10*
800	M08	2b.50 x 5	1b.50 x 10	M08	2b.50 x 5	1b.50 x 10	M08	2b.50 x 5	2b.50 x 10
1000	M10	3b.50 x 5	1b.63 x 10	M10	3b.50 x 5	2b.50 x 10	M10	3b.63 x 5	2b.50 x 10
1250	M12	3b.50 x 5 2b.80 x 5	2b.50 x 10	M12	3b.50 x 5 2b.80 x 5	2b.50 x 10	M12 M16 (1)	3b.63 x 5	2b.50 x 10
1400	M16	3b.50 x 5	2b.50 x 10	M16	2b.80 x 5	2b.50 x 10	M16	3b.80 x 5	2b.63 x 10
1600	M16	3b.63 x 5	2b.50 x 10	M16	3b.80 x 5	2b.63 x 10	M20	3b.80 x 5	3b.50 x 10
1800	M20	3b.80 x 5	2b.63 x 10	M20	3b.80 x 5	2b.63 x 10	M20	3b.100 x 5	2b.80 x 10
2000	M20	3b.100 x 5	2b.80 x 10	M20	3b.100 x 5	2b.80 x 10	M25	3b.100 x 5	3b.63 x 10
2200	M25	3b.100 x 5	2b.80 x 10	M25	3b.100 x 5	2b.80 x 10	M25 (2)	4b.80 x 5	2b.100 x 10
2500	M25	4b.100 x 5	2b.100 x 10	M32	4b.100 x 5	2b.100 x 10	M32	4b.100 x 5	3b.80 x 10
2800	M32	4b.100 x 5	3b.80 x 10	M32	4b.100 x 5	3b.80 x 10	M32	5b.100 x 5	3b.100 x 10
3000	M32	5b.100 x 5	3b.80 x 10	M32	6b.100 x 5	3b.100 x 10	M40	8b.100 x 5	3b.100 x 10
3100/3150	M32	6b.100 x 5	3b.100 x 10	M40	8b.100 x 5	3b.100 x 10	M40	10b.100 x 5	4b.100 x 10
3500	M40	8b.100 x 5	4b.100 x 10	M40	8b.100 x 5	4b.100 x 10	M50	10b.100 x 5	5b.100 x 10
3800	M40	8b.100 x 5	4b.100 x 10	M50	10b.100 x 5	5b.100 x 10	M50	10b.100 x 5	5b.100 x 10
4000	M50	10b.100 x 5	5b.100 x 10	M50	10b.100 x 5	5b.100 x 10	M50	10b.125 x 5	5b.100 x 10
4500	M50	10b.100 x 5	5b.100 x 10	M50	10b.100 x 5	5b.100 x 10	M63	10b.125 x 5	6b.100 x 10
4800	M50	10b.100 x 5	5b.100 x 10	M63	10b.125 x 5	6b.100 x 10	M63	10b.125 x 5	6b.100 x 10
5000	M50	10b.100 x 5	5b.100 x 10	M63	10b.125 x 5	6b.100 x 10			
5400	M63	10b.125 x 5	6b.100 x 10	M63	10b.125 x 5	6b.100 x 10			
6000	M63	10b.125 x 5	6b.100 x 10						

(1) : **exept** */sauf* **M12N**
(2) : **exept** */sauf* **M25L**

LV power air circuit breaker
disjoncteur BT forte intensité
Masterpact

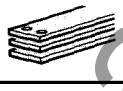
connection
connection

3. fixed breaker, vertical connections
appareil fixe, barres sur chant



maximum service current *intensité maximale véhiculée*	T_a = 40°C			T_a = 50°C			T_a = 60°C		
	Masterpact	no. of bars *nbr. de barres* thick of 5 *larg. de 5*	thick of 10 *larg. de 10*	Masterpact	no. of bars *nbr. de barres* thick of 5 *larg. de 5*	thick of 10 *larg. de 10*	Masterpact	no. of bars *nbr. de barres* thick of 5 *larg. de 5*	thick of 10 *larg. de 10*
800	M08	2b.50 x 5	1b.50 x 10	M08	2b.50 x 5	1b.50 x 10	M08	2b.50 x 5	1b.50 x 10
1000	M10	2b.50 x 5	1b.50 x 10	M10	2b.50 x 5	1b.50 x 10	M10	2b.63 x 5	1b.63 x 10
1250	M12	2b.63 x 5	1b.63 x 10	M12	2b.63 x 5	1b.63 x 10	M12	3b.50 x 5	2b.50 x 10
1400	M16	2b.63 x 5	1b.63 x 10	M16	2b.63 x 5	1b.63 x 10	M16	3b.50 x 5	2b.50 x 10
1600	M16	2b.80 x 5	1b.80 x 10	M16	2b.80 x 5	1b.80 x 10	M16	3b.63 x 5	2b.50 x 10
1800	M20	2b.80 x 5	1b.80 x 10	M20	2b.80 x 5	2b.50 x 10	M20	3b.80 x 5	2b.63 x 10
2000	M20	2b.100 x 5	2b.63 x 10	M20	2b.100 x 5	2b.63 x 10	M20	3b.100 x 5	2b.80 x 10
2200	M25	2b.100 x 5	2b.63 x 10	M25	2b.100 x 5	2b.63 x 10	M25	3b.100 x 5	2b.80 x 10
2500	M25	4b.80 x 5	2b.80 x 10	M25	4b.80 x 5	2b.80 x 10	M25	4b.100 x 5	3b.80 x 10
2800	M32	4b.100 x 5	2b.100 x 10	M32	4b.100 x 5	2b.100 x 10	M32	4b.100 x 5	3b.80 x 10
3000	M32	5b.100 x 5	3b.80 x 10	M32	6b.100 x 5	3b.100 x 10	M32		4b.80 x 10
3200	M32	6b.100 x 5	3b.100 x 10	M32	6b.100 x 5	3b.100 x 10			

4. fixed breaker, horizontal connections
appareil fixe, barres à plat



maximum service current *intensité maximale véhiculée*	T_a = 40°C			T_a = 50°C			T_a = 60°C		
	Masterpact	no. of bars *nbr. de barres* thick of 5 *larg. de 5*	thick of 10 *larg. de 10*	Masterpact	no. of bars *nbr. de barres* thick of 5 *larg. de 5*	thick of 10 *larg. de 10*	Masterpact	no. of bars *nbr. de barres* thick of 5 *larg. de 5*	thick of 10 *larg. de 10*
800	M08	2b.50 x 5	1b.50 x 10	M08	2b.50 x 5	1b.50 x 10	M08	2b.50 x 5	2b.50 x 10
1000	M10	3b.50 x 5	1b.63 x 10	M10	3b.50 x 5	2b.50 x 10	M10	3b.63 x 5	2b.50 x 10
1250	M12	3b.50 x 5 2b.80 x 5	2b.40 x 10	M12	3b.50 x 5 2b.80 x 5	2b.40 x 10	M12	3b.63 x 5	2b.50 x 10
1400	M16	3b.50 x 5	2b.40 x 10	M16	2b.80 x 5	2b.50 x 10	M16	3b.80 x 5	2b.63 x 10
1600	M16	3b.63 x 5	2b.50 x 10	M16	3b.80 x 5	2b.63 x 10	M16	3b.80x 5	3b.50 x 10
1800	M20	3b.80 x 5	2b.63 x 10	M20	3b.80 x 5	2b.63 x 10	M20	3b.100 x 5	2b.80 x 10
2000	M20	3b.100 x 5	2b.80 x 10	M20	3b.100 x 5	2b.80 x 10	M20	3b.100 x 5	3b.63 x 10
2200	M25	3b.100 x 5	2b.80 x 10	M25	3b.100 x 5	2b.80 x 10	M25	4b.80 x 5	2b.100 x 10
2500	M25	4b.100 x 5	2b.100 x 10	M25	4b.100 x 5	2b.100 x 10	M25	4b.100 x 5	3b.80 x 10
2800	M32	4b.100 x 5	3b.80 x 10	M32	4b.100 x 5	3b.80 x 10	M32	5b.100 x 5	3b.100 x 10
3000	M32	5b.100 x 5	3b.80 x 10	M32	6b.100 x 5	3b.100 x 10	M32	8b.100 x 5	4b.80 x 10
3200	M32	6b.100 x 5	3b.100 x 10	M32	8b.100 x 5	3b.100 x 10			

LV power air circuit breaker
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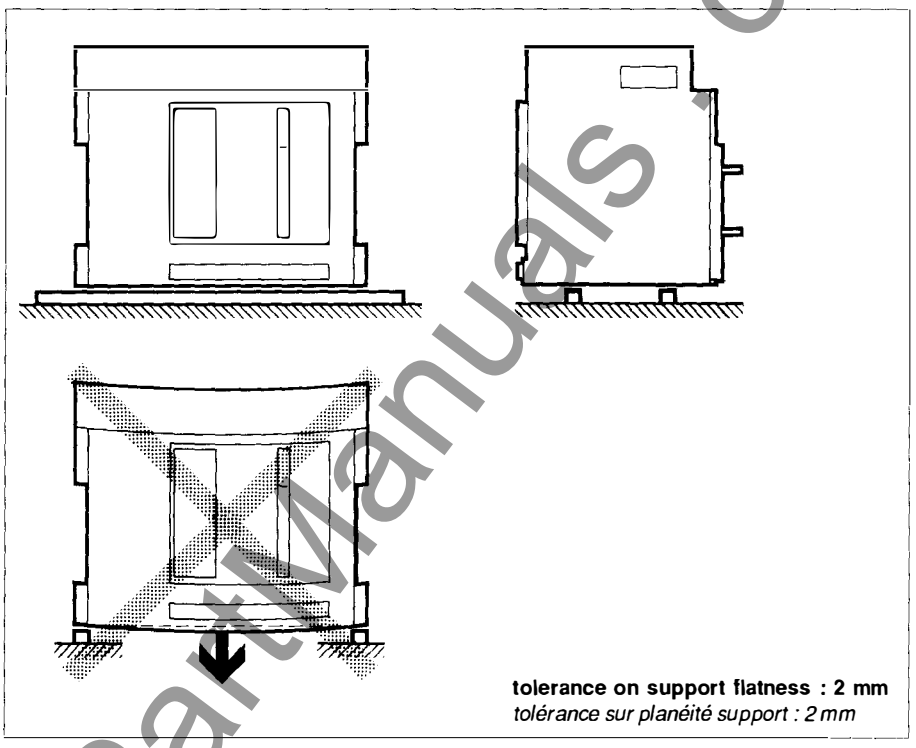
mounting the circuit breakers

It is important to distribute the weight of the equipment uniformily over a rigid mounting surface such as crossbeams or a metal floor for example.
This mounting plane should be perfectly flat : this eliminates any risk of deformation which could interfere with correct operation of the circuit breaker.

fixations des disjoncteurs

Il est important de répartir uniformément la masse de l'appareil sur un plan de fixation rigide, tel que ferrures transversales ou plancher métallique par exemple.
Ce plan de fixation doit être d'une parfaite planéité.
On élimine ainsi un risque de déformation qui pourrait compromettre le bon fonctionnement du disjoncteur.



tolerance on support flatness : 2 mm
tolérance sur planéité support : 2 mm

partitions

■ sufficient openings must be provided to ensure good air circulation around the circuit breaker.

■ for heavy currents, of 2500A and upwards, the metal supports or barriers in the immediate vicinity of a conductor must be made of non-magnetic material A .

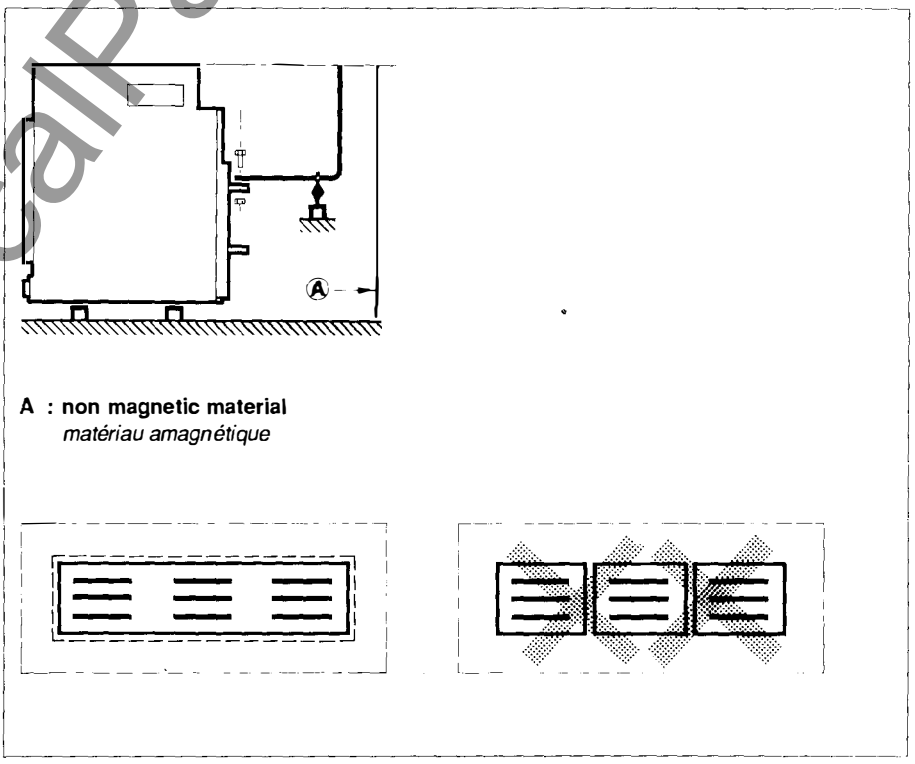
■ metal barriers through which a conductor passes must not form a magnetic loop.

cloisonnements

■ *des ouvertures suffisantes sont à ménager afin de permettre une bonne circulation de l'air autour du disjoncteur*

■ *pour les fortes intensités, à partir de 2500A, les écrans ou supports métalliques situés au voisinage immédiat d'un conducteur sont à réaliser en matériau amagnétique A .*

■ *les écrans métalliques traversés par un conducteur ne doivent pas former de boucle magnétique.*



A : non magnetic material
matériau amagnétique

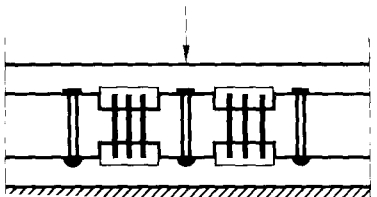
busbars

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

jeux de barres

■ *fixation mécanique excluant la formation de boucle magnétique autour*

A : non magnetic material
matériau amagnétique



LV power air circuit breaker
disjoncteur BT forte intensité
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safety clearance

■ the following tables give the clearances around the circuit breaker necessary to guarantee safe interruption of short circuit currents.

■ dimensions given for the maximum breaking capacity of the breaker.

■ in a compartmentalised switchboard a minimum volume of installation for gas expansion is required, see table.

■ unique design of arc chute cover obviates the need for safety clearance above the circuit breaker (drawout only).

périmétre de sécurité.

■ *les tableaux ci-contre indiquent les distances à respecter autour de l'appareil afin de garantir les performances de l'installation.*

■ *les distances indiquées sont données pour les performances maximales de l'appareil.*

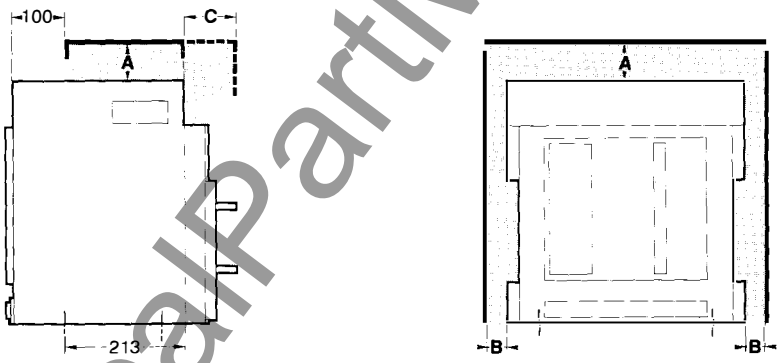
■ *dans un tableau cloisonné, un volume minimum d'installation doit être respecté pour permettre l'expansion des gaz lors de la coupure. Voir tableau ci-contre.*

■ *sur la version débrochable une option capot sur chambre (incompatible avec prise avant) permet d'obtenir une distance de sécurité nulle au-dessus de l'appareil.*

minimum volume of installation (values in dm^3) .
volume minimum d'installation (valeurs en dm^3) .

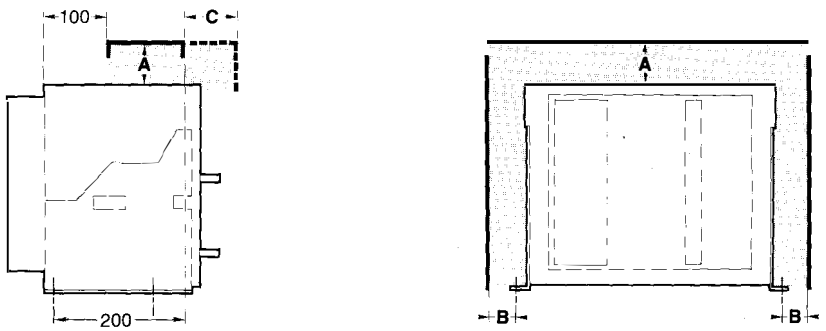
	3P	4P
M32	85	105
M40	105	165
M50	165	210
M63	210	210

drawout breaker
disjoncteur débrochable



types of connection *mode de raccordement*	with insulated screens *avec écrans isolants*			with metallic parts *avec parties métalliques*			with live bars *avec barres sous tension*			with live bars + insulated screens *avec barres sous tension + écrans isolants*		
	A	B	C	A	B	C	A	B	C	A	B	C
front connection (1) *prise avant*	300	15	0	300	50	-	1000	400	-	350	85	30
rear connection without arc chute over *prise arrière sans capot*	0	15	45	150	50	45	1000	400	445	50	85	70
rear connection with arc chute cover *prise arrière avec capot*	0	15	45	0	25	45	60	85	75	20	35	65

fixed breaker
disjoncteur fixe



types of connection *mode de raccordement*	with insulated screens *avec écrans isolants*			with metallic parts *avec parties métalliques*			with live bars *avec barres sous tension*			with live bars + insulated screens *avec barres sous tension + écrans isolants*		
	A	B	C	A	B	C	A	B	C	A	B	C
front connection (1) *prise avant*	385	30	0	385	70	-	1085	420	-	435	100	10

LV power air circuit breaker
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Masterpact

factors affecting switchboard design :

■ the temperature around the circuit breaker and its connections.

■ vents at the top and bottom of the cubicle, it is obviously important to respect the protection index (IP) when constructing such openings. For totally enclosed switchboards it will sometimes be necessary to study a cooling system.

factors which influence the internal temperature of a switchboard :

■ the power dissipated by the breakers at the service current.
Physical size of the switchboard.

■ type of installation (e.g. freestanding or against a wall).

■ specification of the switchboard (Degree of protection, air inlet openings...).

■ horizontal partitions obstructing air circulation.

soin à apporter lors de la conception du tableau

■ *la température autour des appareils et de leurs raccordements permet de définir le type de disjoncteur à utiliser, ainsi que la composition de son raccordement.*

■ *l'aménagement d'ouies de ventilation hautes et basses permet de réduire sensiblement la température à l'intérieur du tableau. Ces ouvertures devront respecter le degré d'étanchéité du tableau. Pour les tableaux étanches il sera parfois nécessaire d'étudier un système de ventilation forcée.*

paramètres influant sur la détermination de la température à l'intérieur d'un tableau :

■ *la puissance dissipée par les appareils installés dans le tableau à leur courant d'emploi.*

■ *les dimensions de l'enveloppe qui déterminent le volume de refroidissement.*

■ *le type d'installation de l'enveloppe (mural, encastré...).*

■ *la conception de l'enveloppe (degré de protection, ouies de ventilation ...).*

■ *les séparations horizontales influant*

Power dissipation

■ power is given in watt .

■ measured values for 3 or 4 pole circuit breakers at In, 50/60 HZ.

Puissance dissipée .

■ *puissance exprimée en watts.*

■ *puissance mesurée sous courant nominal, 50 / 60 Hz.*

■ *appareil 3 ou 4P.*

M08 to/*à* **M20**

	M08N/H M08L	M10N/H M10L	M12N M12L	M12H	M16N/H	M16L	M20N/H	M20L
fixed *fixe*	66	103	150	100	170	220	180	250
draw. *débro.*	160	250	360	230	390	460	365	500

M25 to/*à* **M63**

	M25N/H	M25L	M32H	M40H	M50H	M63H
fixed *fixe*	260	390	500			
draw. *débro.*	520	780	803	1250	1150	1200

Note : These values are the results of extensive heat run testing and reflect the total heating effect rather than the heating caused by I^2R losses alone.

***NB** : Ces valeurs ont été déterminées lors des essais d'échauffement (valeurs supérieures à la puissance $P = R I^2$) .*

resistance between inputs/outputs

values measured per pole in μΩ.

résistance entrée/sortie

valeurs mesurées en μΩ par pôle.

M08 to/*à* **M20**

	M08N/H M08L	M10N/H M10L	M12N	M12H	M12L	M16N/H	M16L	M20N/H
fixed *fixe*	22	22	22	14	36	14	12	9
draw. *débro.*	53	53	53	32	50	32	31	18

M25 to/*à* **M63**

	M25N/H	M25L	M32H	M40H	M50H	M63H
fixed *fixe*	8	10	10			
draw. *débro.*	17	23	15	15	9	9

LV power air circuit breaker
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Masterpact

derating table

The table gives the current rating of Masterpact as a function of :

- mounting pattern : drawout or fixed.
- breaker connections : vertical or horizontal.
- established temperature around the breaker.
- front or mixed connected circuit breakers have the same derating as horizontally connected breakers.
- for ambients greater than 60°C, consult us.

example :

data

Masterpact M20 H1, drawout pattern, vertical connection, ambient temperature around the breaker : 50°C.

solution

The breaker will carry its rated service current of 2000A.

tableau de déclassement

Le tableau ci-contre donne les valeurs de déclassement de Masterpact en fonction de :

- *type d'installation : version fixe ou débrochable.*
- *raccordement avec : barres à plat ou sur chant.*
- *la température ambiante établie autour de celui-ci.*
- *pour un raccordement prise avant ou mixte le déclassement à considérer est le même que pour un raccordement à plat.*
- *pour des températures supérieures à 60°C, nous consulter.*

exemple :

données

Masterpact M20 H1, version débrochable, raccordement sur chant, température autour de l'appareil 50°C.

solution

L'appareil pourra être utilisé à son courant nominal d'emploi : 2000A.

Masterpact			**M08N/H/L**	**M10N/H/L**	**M12N/H/L**	**M16N/H**	**M16L**	**M20N/H/L**	**M25N/H**	**M25L**	**M32H**	**M40H**	**M50H**	**M6H**
version *version*	**connection** *connection*	**T°C**												
drawout *débrochable*	**front or rear horizontal** *prise avant ou prise arrière à plat*	40	800	1000	1250	1600	1600	2000	2500	2500	3150	3800	5000	6000
		45	800	1000	1250	1600	1600	2000	2500	2350	3080	3650	4750	5700
		50	800	1000	1250	1600	1600	2000	2430	2250	3000	3500	4500	5400
		55	800	1000	1250	1600	1600	2000	2350	2150	2900	3300	4250	5100
		60	800	1000	1200	1550	1500	1900	2250	2000	2800	3100	4000	4800
	rear vertical *prise arrière sur chant*	40	800	1000	1250	1600	1600	2000	2500	2500	3200	4000	5000	6300
		45	800	1000	1250	1600	1600	2000	2500	2500	3200	3800	5000	6000
		50	800	1000	1250	1600	1600	2000	2500	2500	3100	3600	5000	5700
		55	800	1000	1250	1600	1600	2000	2500	2350	3000	3400	5000	5400
		60	800	1000	1250	1550	1600	1900	2400	2200	2900	3200	4700	5100
fixed	**front** *prise avant*	40	800	1000	1250		1600	1600	2000		2500	2500	3200	
		45	800	1000	1250		1600	1600	2000		2500	2500	3200	
		50	800	1000	1250		1600	1600	2000		2500	2500	3200	
		55	800	1000	1250		1600	1600	2000		2500	2500	3200	
		60	800	1000	1250		1600	1600	2000		2500	2300	3100	
	rear horizontal or vertical *prise arrière à plat ou sur chant*	40	800	1000	1250		1600	1600	2000		2500	2500	3200	
		45	800	1000	1250		1600	1600	2000		2500	2500	3200	
		50	800	1000	1250		1600	1600	2000		2500	2500	3200	
		55	800	1000	1250		1600	1600	2000		2500	2500	3200	
		60	800	1000	1250		1600	1600	2000		2500	2500	3100	

LV power air circuit breaker
disjoncteur BT forte intensité
Masterpact

derating guide of Masterpact in switchboard

warning

■ the values indicated in these tables have been extrapolated from test data. These tables constitute a guide to good switchboard design but cannot replace industrial experience or a temperature rise test on a sample switchboard.

basis of tables

■ see here after for switchboard dimensions.
■ number of circuit breakers installed.
■ breakers fitted on crossbeams.
■ type of breaker connections.
■ all breakers are drawout.
■ ambient temperature outside of the switchboard : T_A.

guide de déclassement Masterpact en tableau

avertissement

■ *les valeurs indiquées dans les tables sont le fruit d'essais et de calculs théoriques effectués à partir des paramètres cités ci-après. Ces tables peuvent constituer un guide pour la conception d'un tableau mais ne peuvent remplacer l'expérience acquise sur un type de tableau ni éviter des essais de vérifications.*

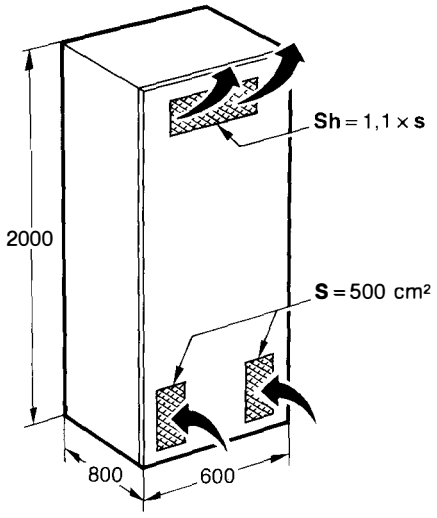
paramètres d'établissement des tables

■ *dimensions des tableaux : voir ci-après.*
■ *nombre d'appareils installés.*
■ *appareils montés sur ferrures transversales.*
■ *mode de raccordement des appareils.*
■ *appareils version débrochable.*
■ *température ambiante à l'extérieur du tableau : T_A.*

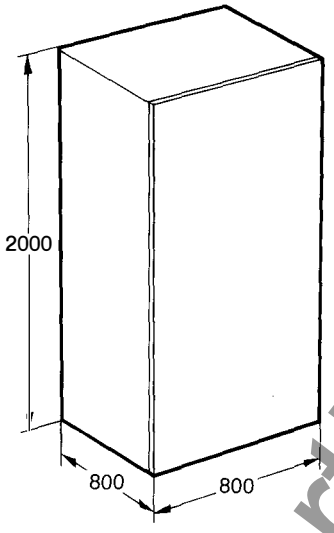
LV power air circuit breaker
disjoncteur BT forte intensité
Masterpact

derating in switchboard for M08 to M32
déclassement en tableau pour appareils M08 à M32

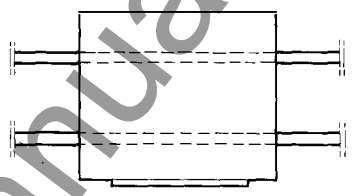
ventilated switchboard
tableau ventilé
(up to/*jusqu'à* IP42)



totally enclosed switchboard
tableau non ventilé
(IP54)



breakers installed on crossbeams
(improved air circulation)
appareils montés sur ferrures transversales
(améliorant la circulation de l'air à l'intérieur des tableaux)



Masterpact			**M08N-M08H (800A)**					**M10N-M10H (1000A)**					**M12N (1250A)**					**M12H (1250A)**				
switchboard composition *composition tableaux*			[1]	[1]	[2][1]	[3][2][1]	[4][3][2][1]	[1]	[1]	[2][1]	[3][2][1]	[4][3][2][1]	[1]	[1]	[2][1]	[3][2][1]	[4][3][2][1]	[1]	[1]	[2][1]	[3][2][1]	[4][3][2][1]
connection type *mode de raccordement*			≡	⫼	⫼	⫼	⫼	≡	⫼	⫼	⫼	⫼	≡	⫼	⫼	⫼	⫼	≡	⫼	⫼	⫼	⫼
ventilated switchboard *tableau ventilé*	$T_A = 30°C$	**4**					800					1000					1000					1250
		3				800	800				1000	1000				1230	1250				1250	1250
		2			800	800	800			1000	1000	1000			1250	1250	1250			1250	1250	1250
		1	800	800	800	800	800	1000	1000	1000	1000	1000	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250
	$T_A = 40°C$	**4**					800					1000					1000					1250
		3				800	800				1000	1000				1120	1000				1250	1250
		2			800	800	800			1000	1000	1000			1250	1250	1120			1250	1250	1250
		1	800	800	800	800	800	1000	1000	1000	1000	1000	1250	1250	1250	1250	1120	1250	1250	1250	1250	1250
	$T_A = 50°C$	**4**					800					800					835					950
		3				800	800				1000	800				1000	835				1250	950
		2			800	800	800			1000	1000	800			1150	1000	835			1250	1250	1000
		1	800	800	800	800	800	1000	1000	1000	1000	800	1250	1250	1250	1250	835	1250	1250	1250	1250	1000
totally enclosed switchboard *tableau non ventilé*	$T_A = 30°C$	**4**					750															980
		3				800	750				930					975					1150	980
		2			800	800	750			1000	930				1150	975				1250	1150	980
		1	800	800	800	800	750	1000	1000	1000	930		1250	1250	1250	975		1250	1250	1250	1150	980
	$T_A = 40°C$	**4**					630															820
		3				770	630				780					815					980	820
		2			800	770	630			1000	780				1000	815				1250	980	820
		1	800	800	800	770	630	1000	1000	1000	780		1200	1250	1050	815		1250	1250	1250	980	820
	$T_A = 50°C$	**4**					490															635
		3				600	490														750	635
		2			800	600	490			850					900					1080	750	635
		1	800	800	800	600	490	1000	1000	850			1000	1100	900			1250	1250	1080	750	635

LV power air circuit breaker
disjoncteur BT forte intensité
Masterpact

derating in switchboard for M08 to M32
déclassement en tableau pour appareils M08 à M32

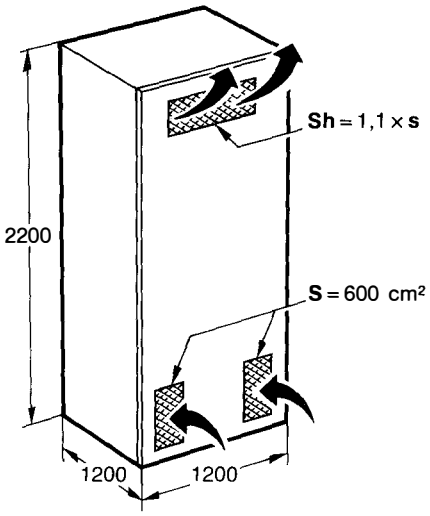
Masterpact			M16N-M16H (1600A)					M20N-M20H (2000A)					M25N-M25H (2500A)					M32H (3200A)				
switchboard composition *composition tableaux*			1	1	2 1	3 2 1	4 3 2 1	1	1	2 1	3 2 1	4 3 2 1	1	1	2 1	3 2 1	4 3 2 1	1	1	2 1	3 2 1	4 3 2 1
connection type *mode de raccordement*			≡	III	III	III	III	≡	III	III	III	III	≡	III	III	III	III	≡	III	III	III	III
ventilated switchboard *tableau ventilé*	$T_A = 30°C$	4					1300					1900					2000					
		3				1600	1550				2000	2000				2250	2000					2400
		2			1600	1600	1600			2000	2000	2000			2500	2500	2250			2900	2900	
		1	1600	1600	1600	1600	1600	2000	2000	2000	2000	2000	2500	2500	2500	2500	2250	3150	3200	3200	3200	
	$T_A = 40°C$	4					1275					1650					1725					
		3				1360	1275				1900	1650				2000	1725					2380
		2			1600	1550	1275			2000	1950	1650			2400	2300	1725			2500	2380	
		1	1600	1600	1600	1600	1275	2000	2000	2000	2000	1650	2500	2500	2500	2500	1725	3000	3200	3200	2380	
	$T_A = 50°C$	4					1000					1250										
		3				1250	1000				1660	1250				1600						1800
		2			1350	1250	1000			1900	1660	1250			2250	1800				2500	2000	
		1	1550	1600	1600	1600	1000	2000	2000	2000	1660	1250	2400	2500	2250	2000		2800	2900	2500	2000	
totally enclosed switchboard *tableau non ventilé*	$T_A = 30°C$	4																				
		3				1170					1500											
		2			1340	1170				1900	1500				2240					2500		
		1	1600	1600	1600	1170		2000	2000	2000	1500		2500	2500	2240			2540	2750	2500		
	$T_A = 40°C$	4																				
		3				1000					1255											
		2			1250	1000				1790	1255				1940					2070		
		1	1550	1600	1250	1000		1900	2000	1790	1255		2040	2200	1940			2320	2450	2070		
	$T_A = 50°C$	4																				
		3									1000											
		2			1100					1395	1000				1500					1650		
		1	1250	1340	1100			1750	1900	1395	1000		1870	2000	1500			2000	2150	1650		

Masterpact			M12L				M16L				M20L				M25L		
switchboard composition *composition tableaux*			1	1	2 1	3 2 1	1	1	2 1	3 2 1	1	1	2 1	3 2 1	1	1	2 1
connection type *mode de raccordement*			≡	III	III	III	≡	III	III	III	≡	III	III	III	≡	III	III
ventilated switchboard *tableau ventilé*	$T_A = 30°C$	4															
		3				1250				1600				1900			
		2			1250	1250			1600	1600			2000	2000			2380
		1	1250	1250	1250	1250	1600	1600	1600	1600	2000	2000	2000	2000	2410	2500	2500
	$T_A = 40°C$	4															
		3				1250				1000				1800			
		2			1250	1250			1600	1250			1940	1900			2080
		1	1250	1250	1250	1250	1600	1600	1600	1250	2000	2000	2000	2000	2200	2500	2500
	$T_A = 50°C$	4															
		3				1030				1000				1250			
		2			1250	1030			1300	1120			1820	1250			2130
		1	1250	1250	1250	1030	1500	1600	1600	1250	1900	1920	1900	1600	2000	2170	2130
totally enclosed switchboard *tableau non ventilé*	$T_A = 30°C$	4															
		3				760				1000				1300			
		2			1250	1000			1250	1000			1680	1300			1830
		1	1250	1250	1250	1000	1600	1600	1600	1250	1970	1980	1850	1300	1900	2200	1840
	$T_A = 40°C$	4															
		3				750				800				1150			
		2			1080	800			1250	800			1310	1150			1600
		1	1250	1250	1080	800	1420	1550	1250	1000	1840	1850	1600	1150	1800	2000	1600
	$T_A = 50°C$	4															
		3				610											
		2			840	610			980				1000				1100
		1	1200	1200	840	610	1250	1310	980		1670	1670	1250		1700	1730	1250

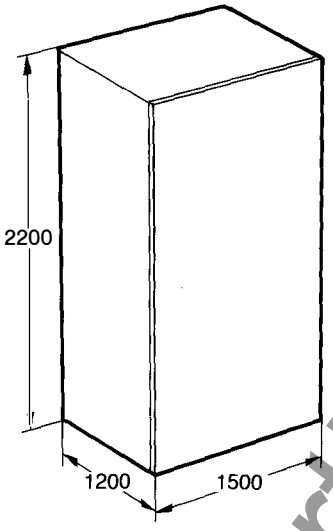
LV power air circuit breaker
disjoncteur BT forte intensité
Masterpact

derating in switchboard for M40 to M63
déclassement en tableau pour appareils M40 à M63

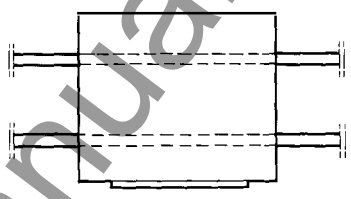
ventilated switchboard
tableau ventilé
(up to/*jusqu'à* IP42)



totally enclosed switchboard
tableau non ventilé
(IP54)



breakers installed on crossbeams
(improved air circulation)
appareils montés sur ferrures transversales
(améliorant la circulation de l'air à l'intérieur des tableaux)



Masterpact			M40H			M50H		M63H	
switchboard composition *composition tableaux*			1	1	2 / 1	1	1	1	1
connection type *mode de raccordement*			≡	≡ ≡	≡ ≡	≡	≡ ≡	≡	≡ ≡
ventilated switchboard *tableau ventilé*	T_A = 30°C	4							
		3							
		2			3400				
		1	3800	4000	4000	4900	5000	6000	6300
	T_A = 40°C	4							
		3							
		2			3200				
		1	3500	3600	3200	4500	5000	5300	5600
	T_A = 50°C	4							
		3							
		2			3000				
		1	3150	3250	3000	4100	4700	4950	5250
totally enclosed switchboard *tableau non ventilé*	T_A = 30°C	4							
		3							
		2							
		1	3150	3200		4000	4750	4800	5200
	T_A = 40°C	4							
		3							
		2							
		1	2900	3000		3700	4150	4650	4900
	T_A = 50°C	4							
		3							
		2							

installation of accessory modules

■ the modules can be installed within the switchboard.

■ optionally, on a drawout pattern breaker they can be installed above the circuit breaker on a support accessory (ABM).
Note : When the support accessory is mounted on Masterpact the terminal shield (CB) cannot be supplied.

connection of auxiliary wiring

■ quick connection of the auxiliary circuits is possible thanks to the WAGO type connectors.

drawout pattern

■ auxiliary connections are made from the front.

■ an option terminal shield (CB) fitted to the chassis of the drawout breakers prevents access to the electrical auxiliary connection terminals.

■ as standard, auxiliary connections are made to a terminal block at the front of the chassis. The breaker auxiliary circuits are connected by blocks that operate automatically to isolate the auxiliary circuits when the breaker is in the"disconnected" position.
Optionally, by one or two plugs disconnectable and accessible from the front.

fixed pattern

■ the auxiliaries are connected by one or two plugs accessible and disconnectable from the front.

■ allow free space for the wiring harness.

installation des modules

■ *les modules peuvent être installés à l'intérieur du tableau.*

■ *en option, sur la version débrochable ils peuvent être installés sur la plaque support d'adaptation (ABM) fixée sur la partie supérieure du chassis.*
NB : Le montage de la plaque support d'adaptation sur la partie supèrieure du chassis est incompatible avec l'option capot sur bornier (CB).

raccordement des auxiliaires

■ *connexion rapide des circuits sur des bornes de type WAGO.*

version débrochable

■ *accessibilité des borniers par l'avant.*

■ *une option capot sur bornier (CB) est proposée afin d'assurer une meilleure protection des auxiliaires.*

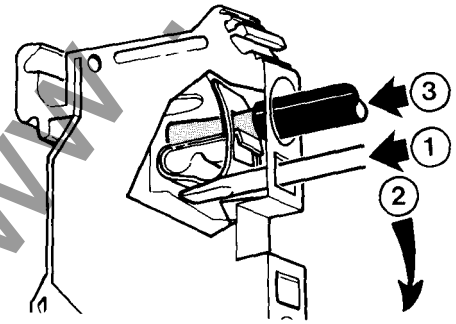
■ *les circuits auxiliaires de l'appareil sont connectés par des blocs de raccordement à embrochage automatique lié à la position de l'appareil (connecté-déconnecté-test), ou en option par une ou deux prises déconnectables montées sur l'appareil.*

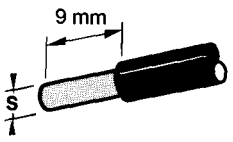
version fixe

■ *le raccordement des auxiliaires est assuré par des prises déconnectables situées au dessus de l'appareil.*

■ *ces prises peuvent être connectées ou déconnectées facilement de l'avant de l'appareil.*
Prévoir un emplacement pour le toron filerie.

Detail of the WAGO connector
Détail borne type WAGO





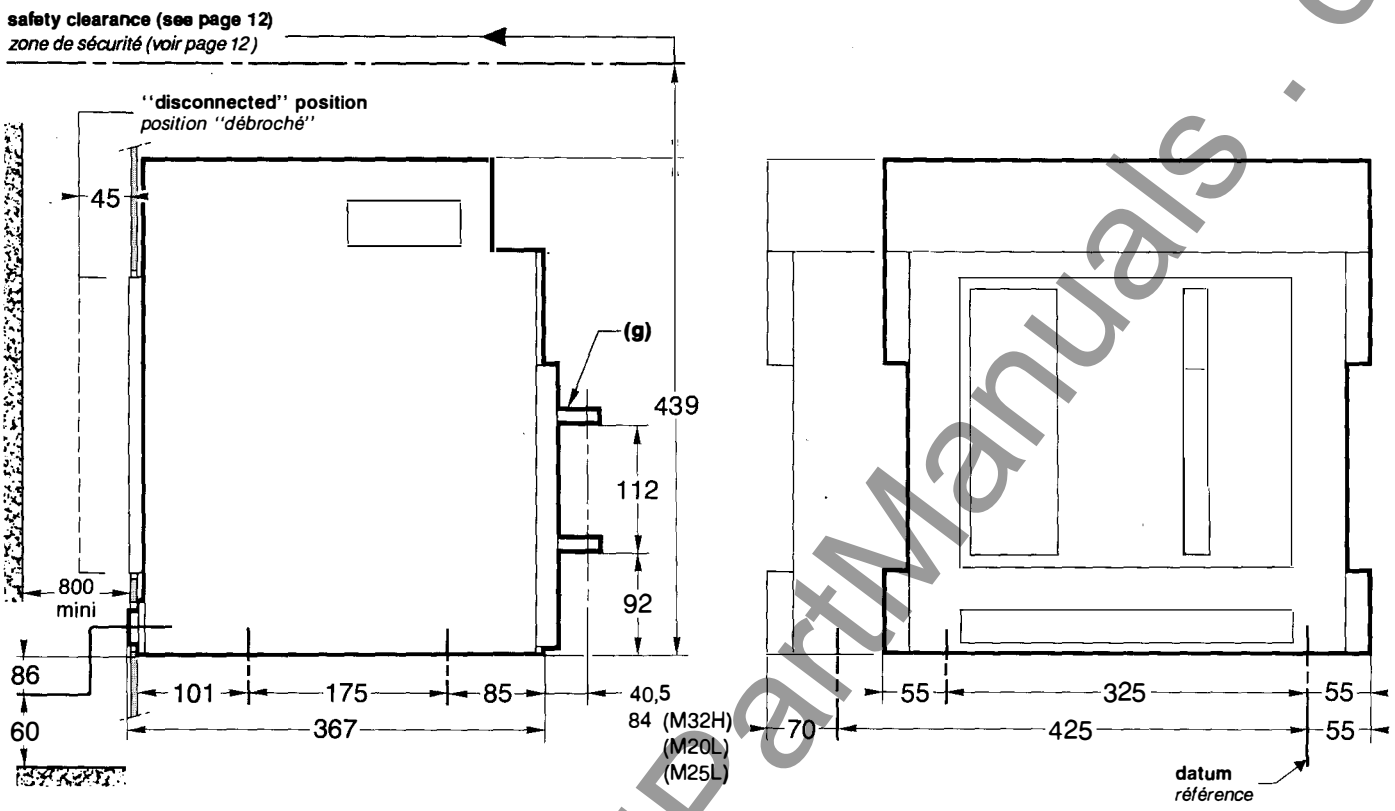
$0,6 \leq s \leq 2,5\ mm^2$

LV power air circuit breaker
disjoncteur BT forte intensité
Masterpact

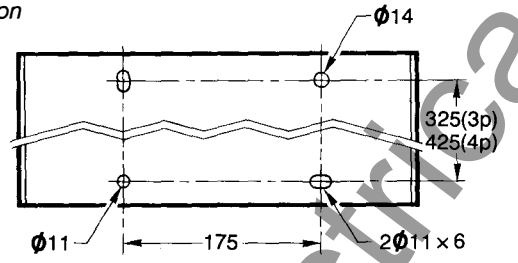
outline drawings and connection arrangement
plans d'installation et de raccordement

installation
Masterpact
M08 to/*à* M32

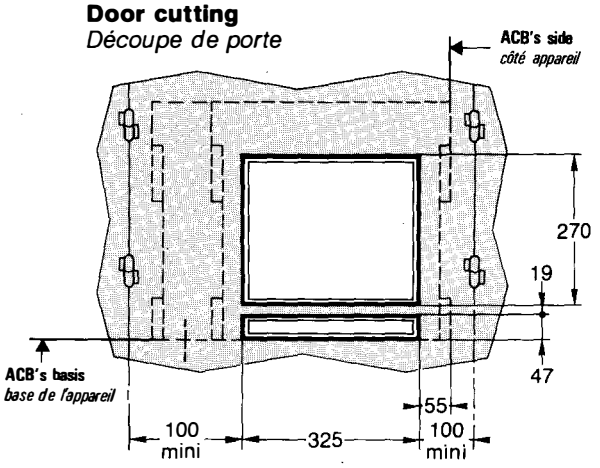
3 and 4 poles, drawout pattern
3 et 4 pôles, débrochables



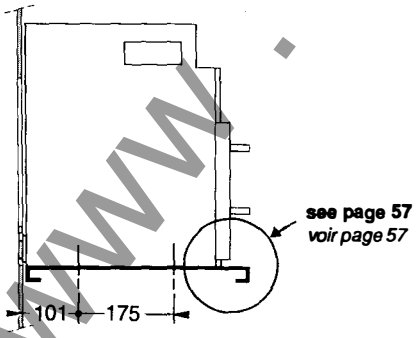
Fixing detail
Détail fixation



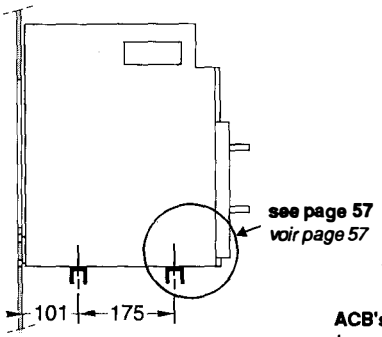
Door cutting
Découpe de porte



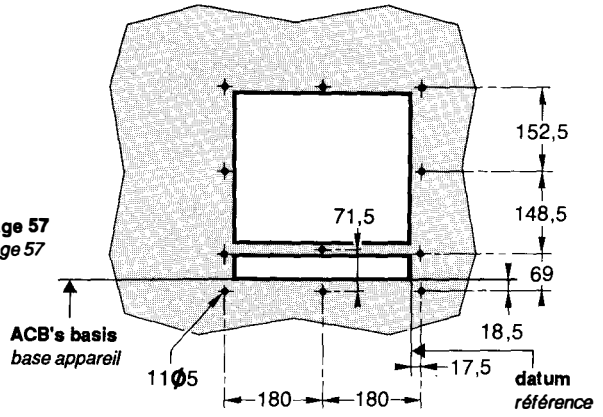
Drilling for fixing:
Perçage pour fixation :
on base plate (q)
sur platine (q)



on rails (q)
sur ferrures (q)



Drilling for fixation of the door frame
Perçage porte pour fixation du faux plastron

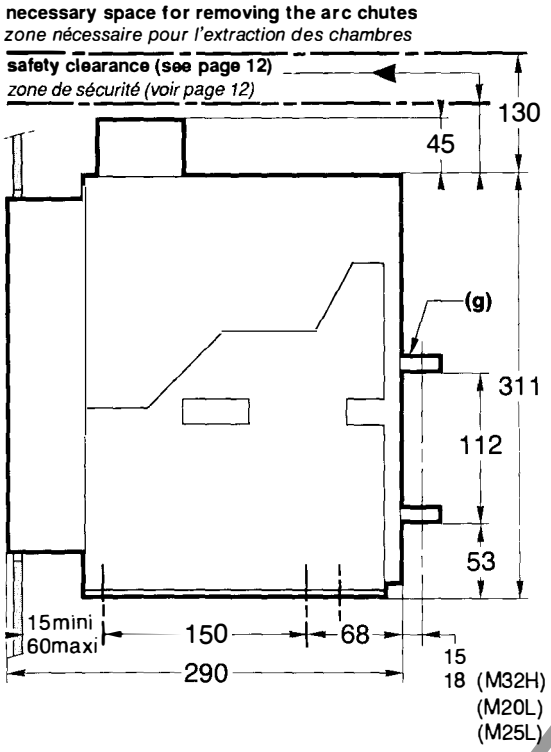


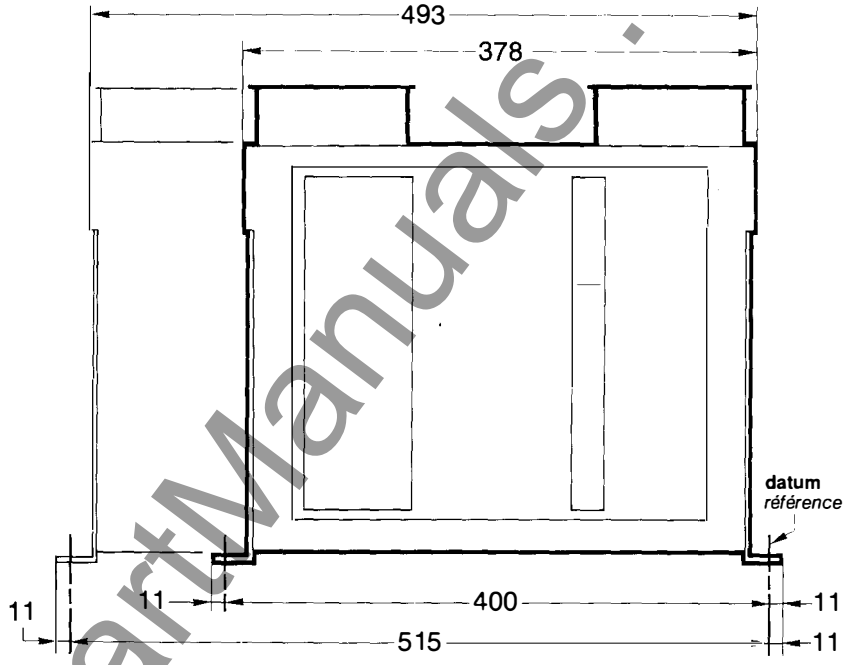
(q) : see connection drawings *(voir schémas de raccordement*

approximative mass / *masse approximative*

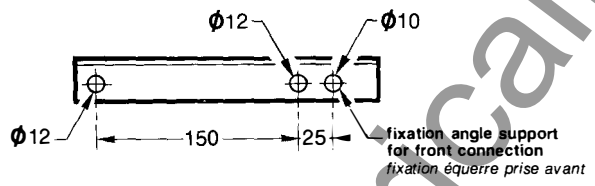
installation
Masterpact
M08 to/*à* M32

3 and 4 poles, fixed pattern
3 et 4 pôles, fixes

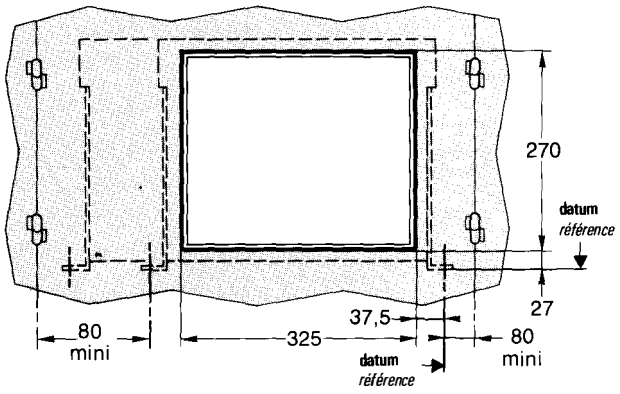




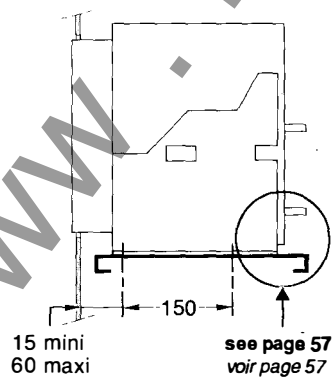
Fixing detail
Détail fixation



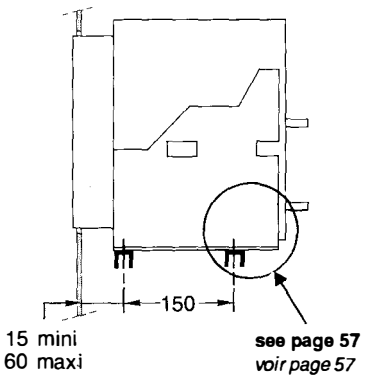
Door cutting
Découpe de porte



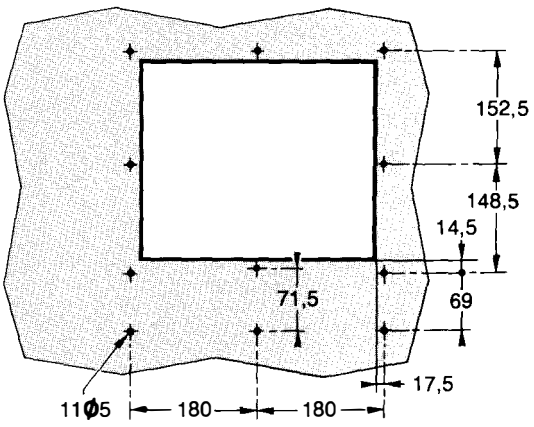
Drilling for fixing:
Perçage pour fixation :
on base plate (q)
sur platine (q)



on rails (q)
sur ferrures (q)

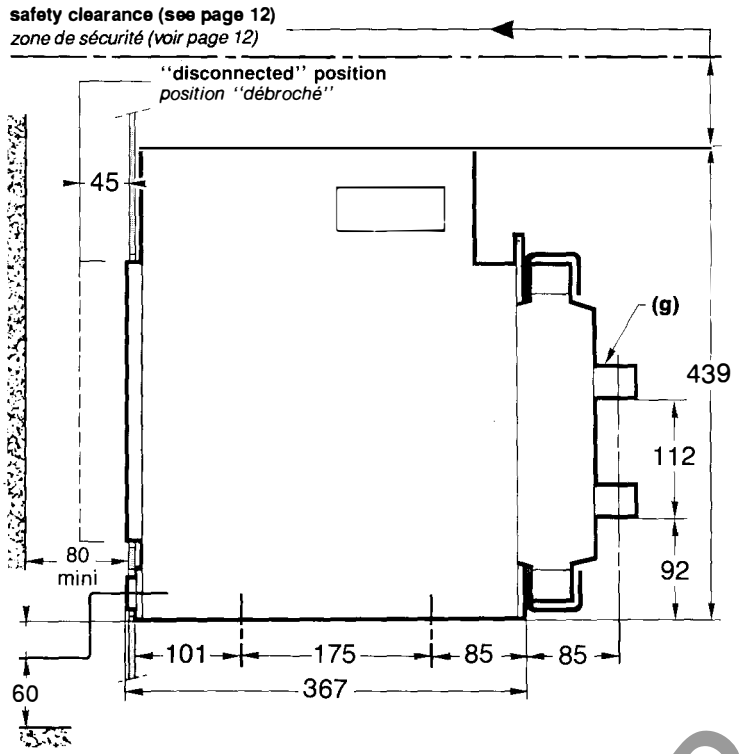


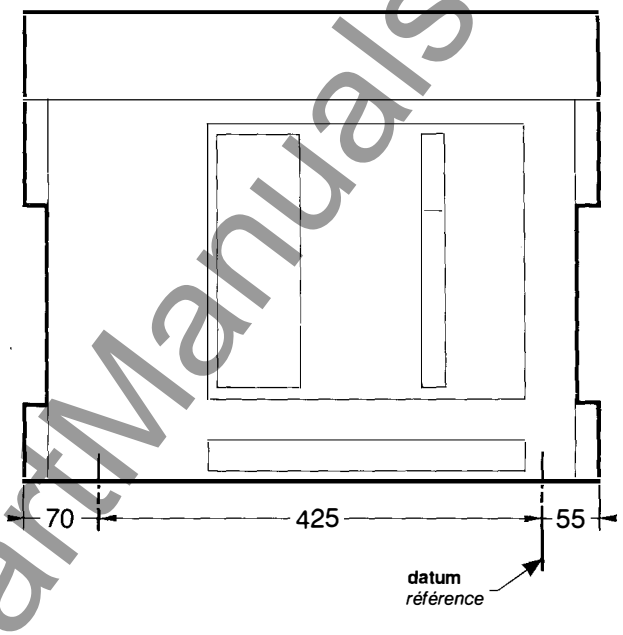
Drilling for fixation of the door frame
Perçage porte pour fixation du faux plastron



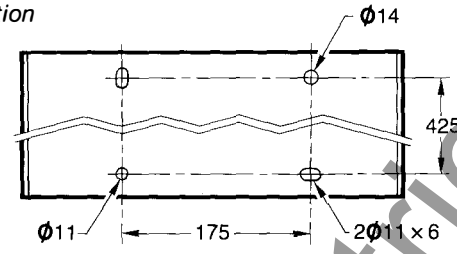
installation
Masterpact
M40(3p)

3 poles, drawout pattern
3 pôles, débrochables

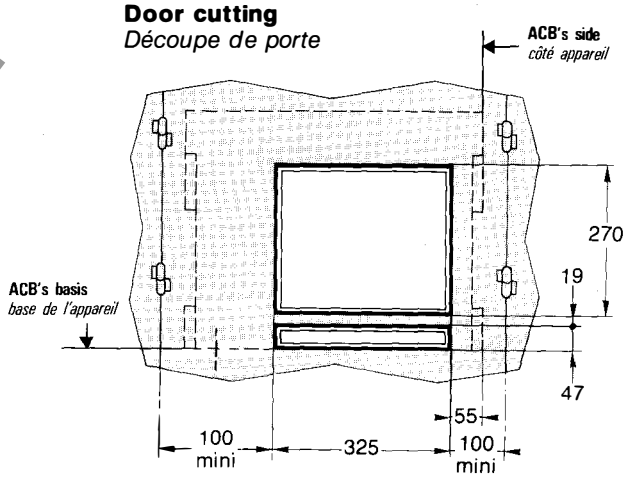




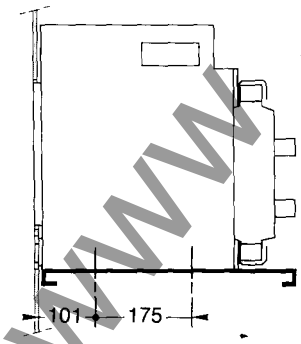
Fixing detail
Détail fixation



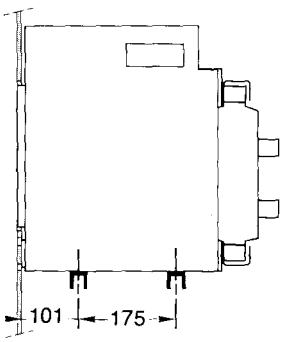
Door cutting
Découpe de porte



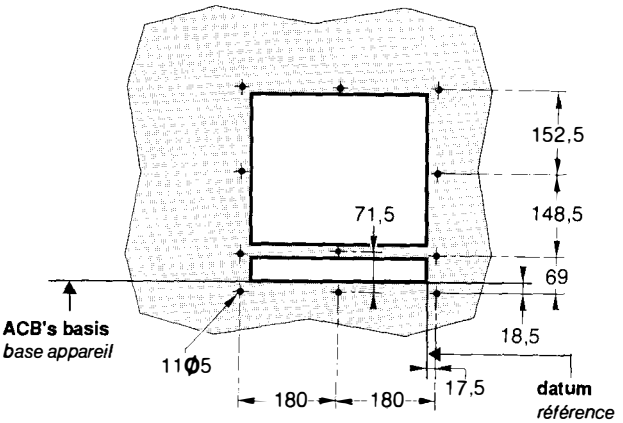
Drilling for fixing:
Perçage pour fixation :
on base plate (q)
sur platine (q)



on rails (q)
sur ferrures (q)



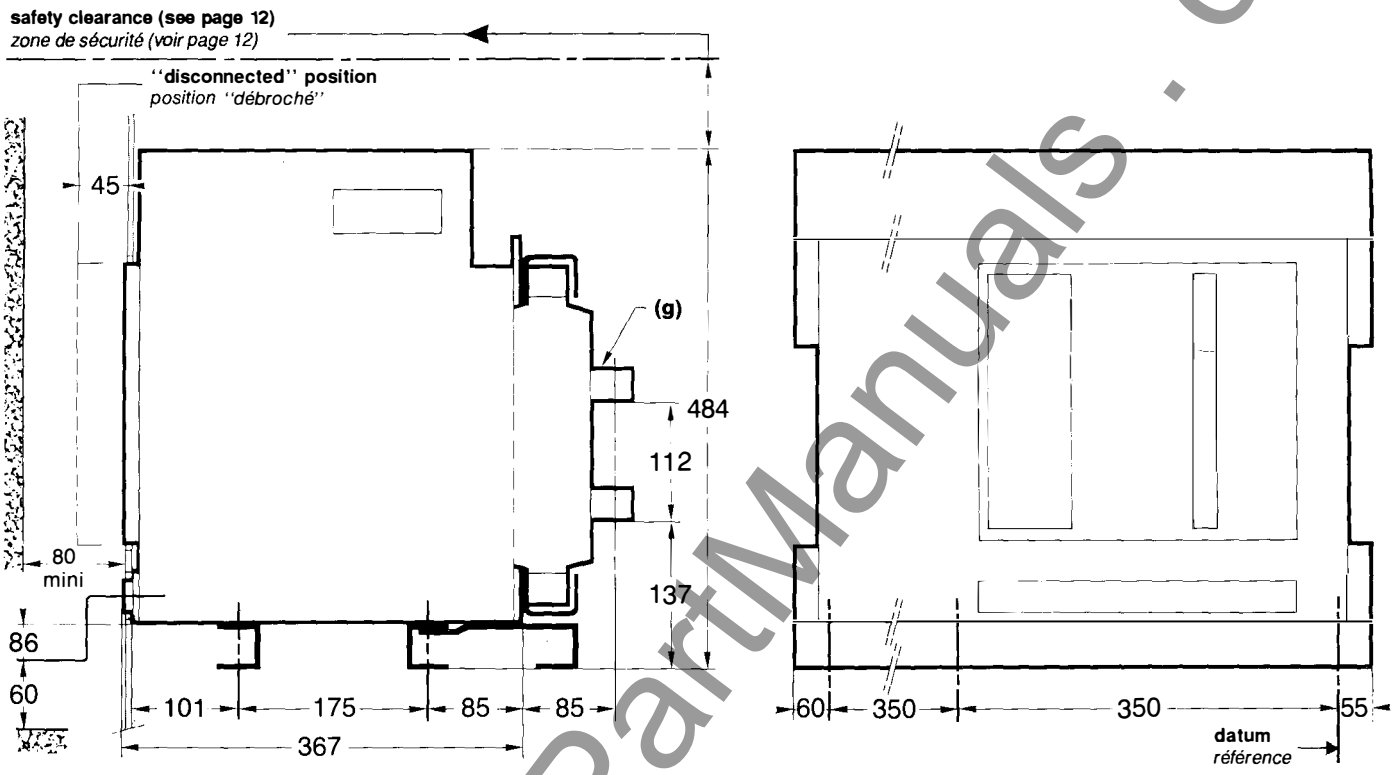
Drilling for fixation of the door frame
Perçage porte pour fixation du faux plastron



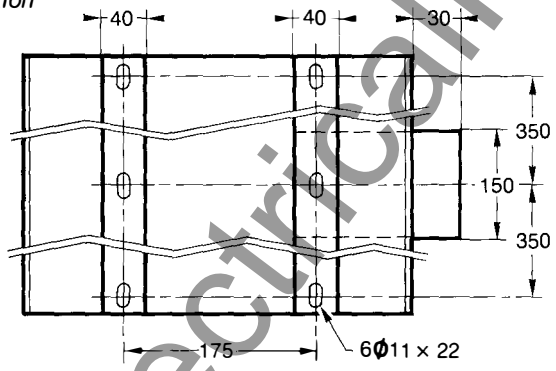
(q): see connection drawings/ *voir schémas de raccordement*

installation
Masterpact
M40(4p)/M50(3p)

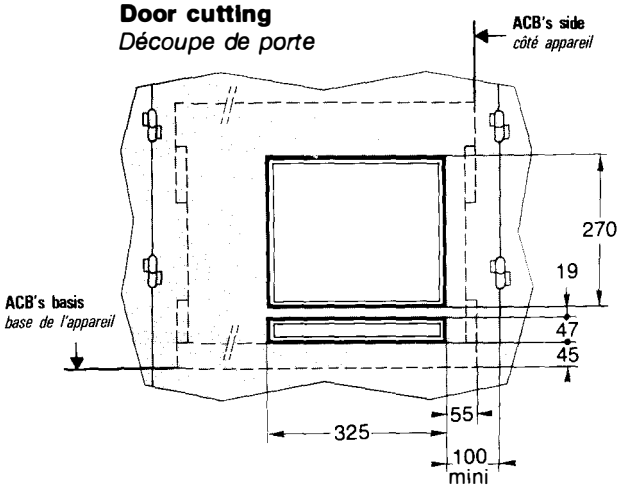
drawout pattern
débrochables



Fixing detail
Détail fixation

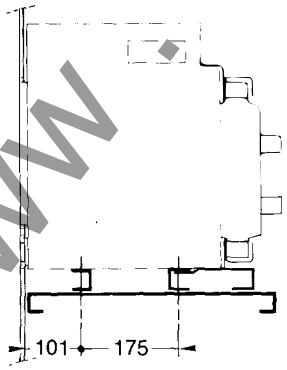


Door cutting
Découpe de porte

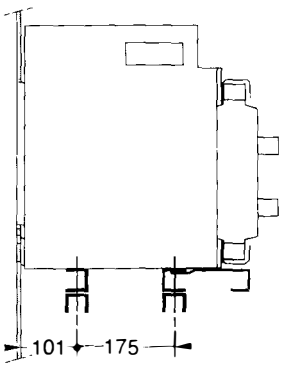


Drilling for fixing:
Perçage pour fixation :

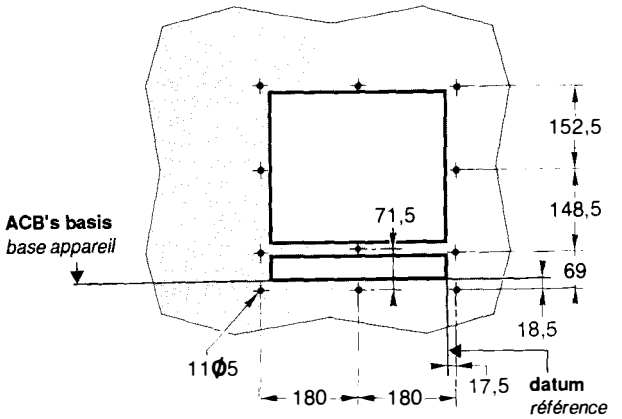
on base plate (q)
sur platine (q)



on rails (q)
sur ferrures (q)

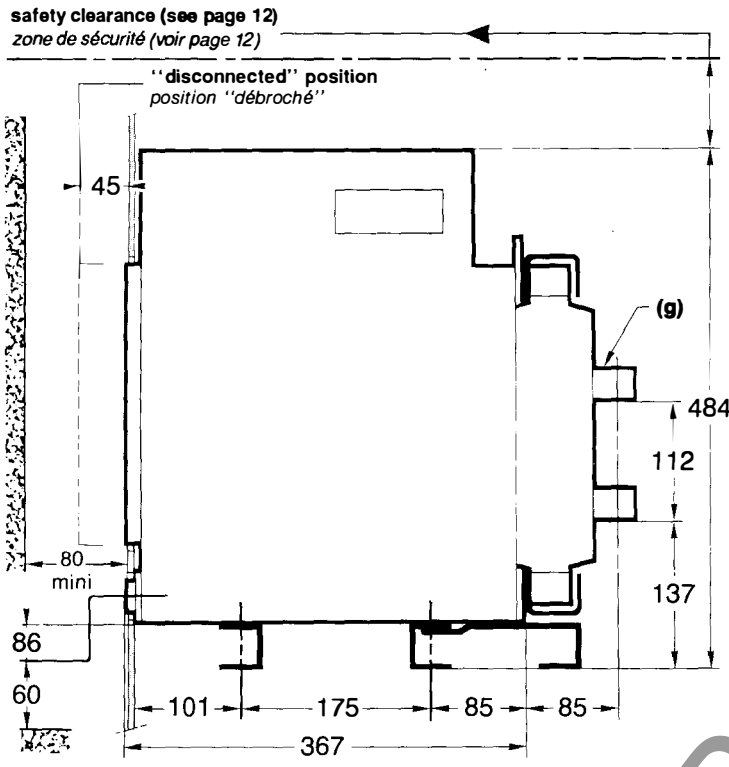


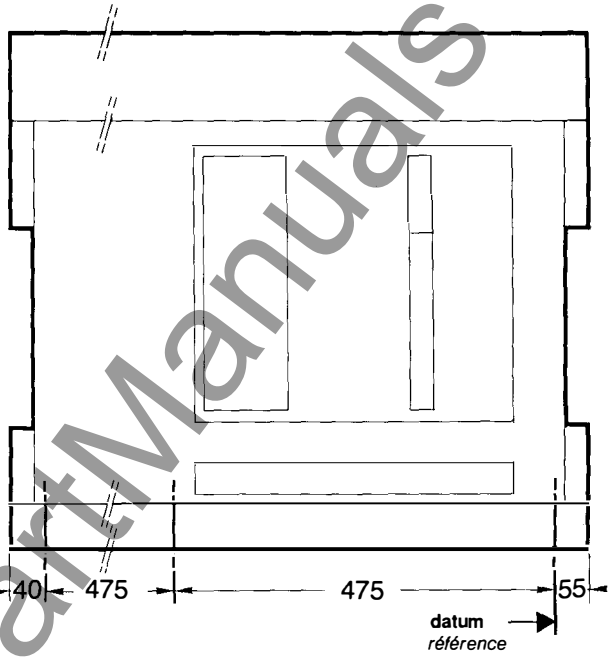
Drilling for fixation of the door frame
Perçage porte pour fixation du faux plastron



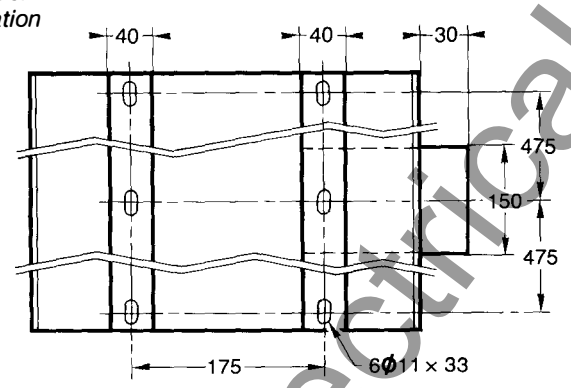
installation
Masterpact
M50(4p)/M63(3p)/M63(4p)

drawout pattern
débrochables

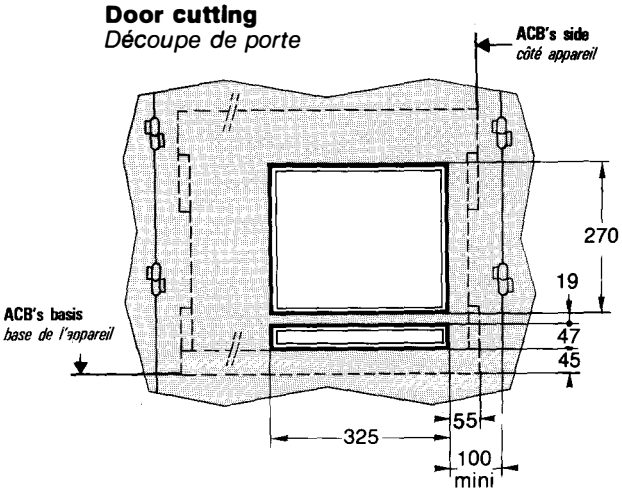




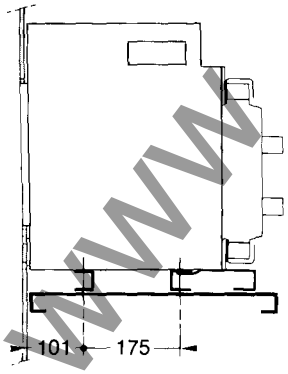
Fixing detail
Détail fixation



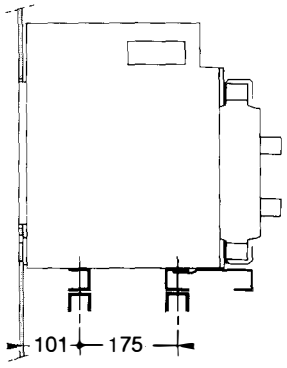
Door cutting
Découpe de porte



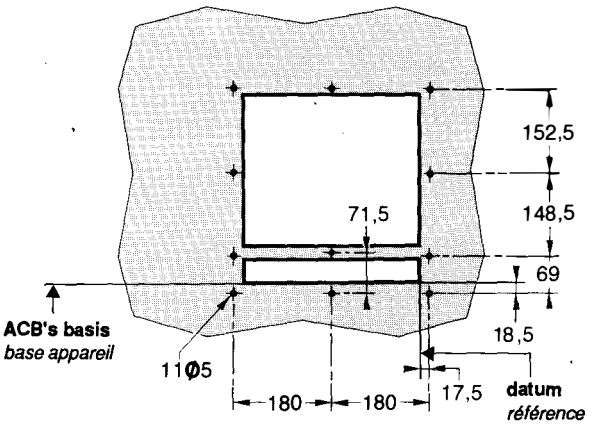
Drilling for fixing:
Perçage pour fixation :
on base plate (q)
sur platine (q)



on rails (q)
sur ferrures (q)



Drilling for fixation of the door frame
Perçage porte pour fixation du faux plastron

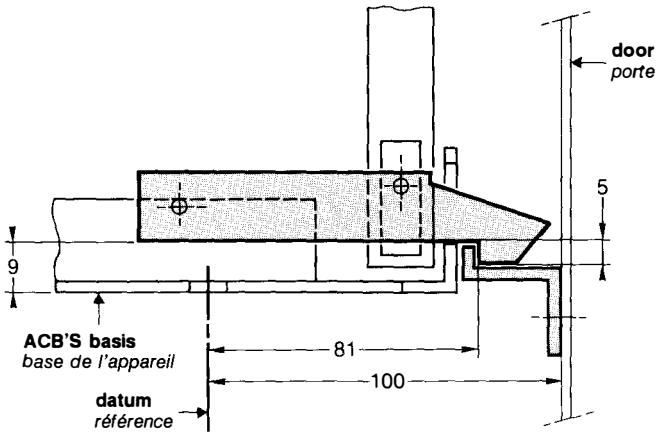


(q) : **see connection drawings** *(voir schémas de raccordement*

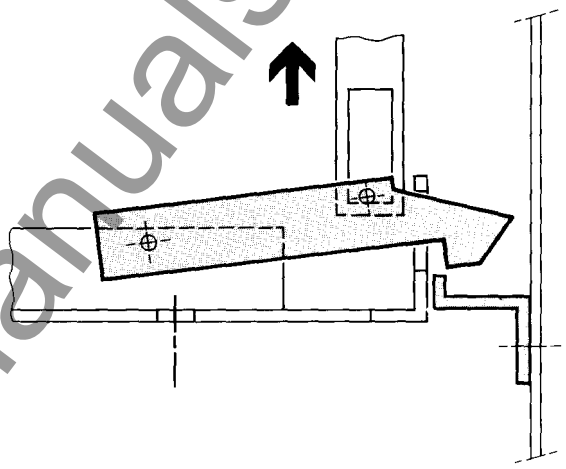
installation
Masterpact
M08 to/*à* M63

door locking
verrouillage de porte

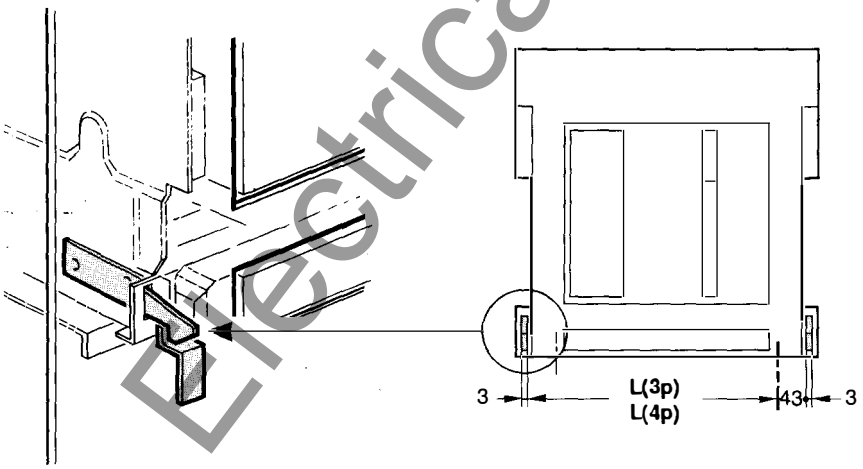
breaker in "connected" or "test" position
opening of the door locked
appareil position ''connecté'' ou ''test''
ouverture porte verrouillée



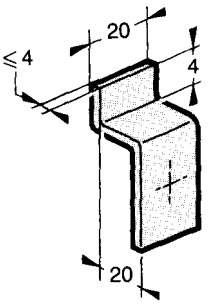
breaker in "disconnected" position
opening of the door unlocked
appareil position ''déconnecté''
ouverture porte non verrouillée



door interlocking catch
réalisation du verrouillage



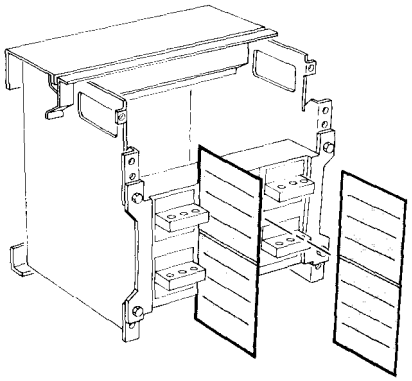
accessory to be manufactured
accessoire à réaliser

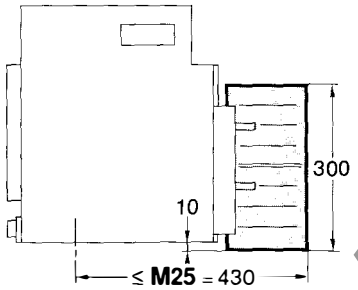


Dimensions (mm)

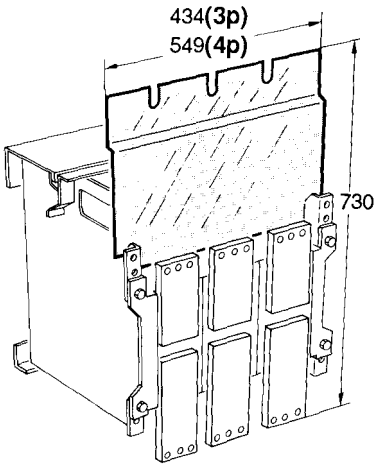
	M08/M32	M40	M50	M63
L(3p)	368	483	748	978
L(4p)	483	748	978	978

interphase barrier
séparateurs de phase
M08 to/*à* **M40(3p)**

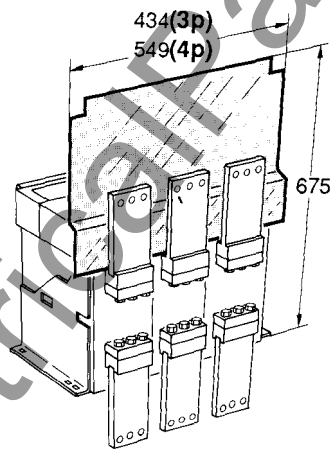




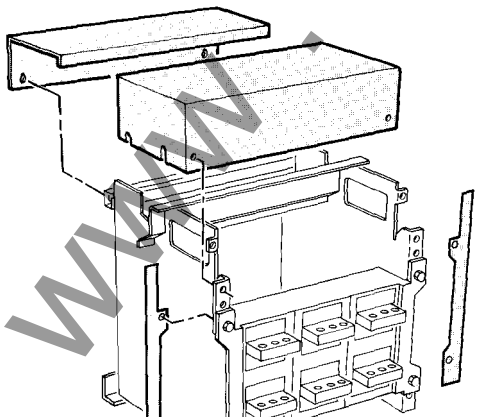
front connection screen
écran prise avant
drawout breaker
appareil débrochable
M08 to/*à* **M32**



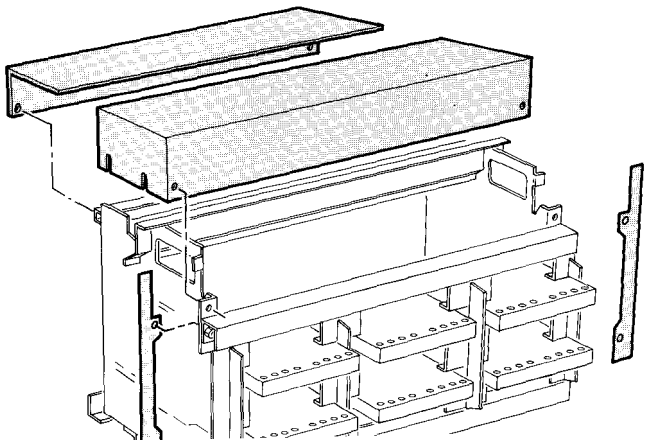
fixed breaker
appareil fixe



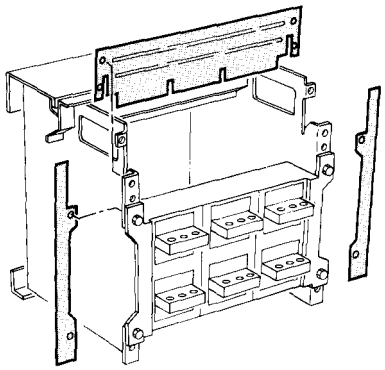
terminal shields
capot sur borniers
arc chute cover
capot sur chambres
M08 to/*à* **M40(3p)**



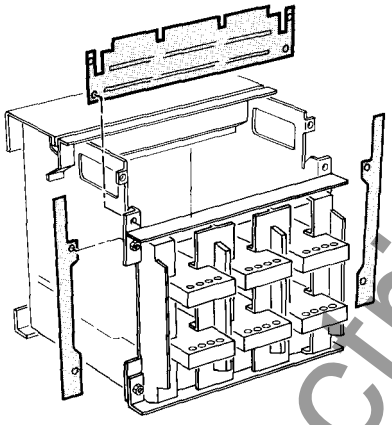
terminal shields
capot sur borniers
arc chute cover
capot sur chambres
M40(4p)/M50/M63



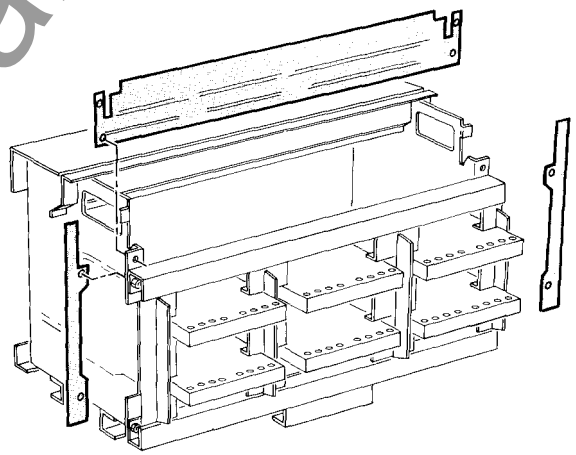
partitioning fixture
adaptation de cloisonnement
M08 to/*à* M25



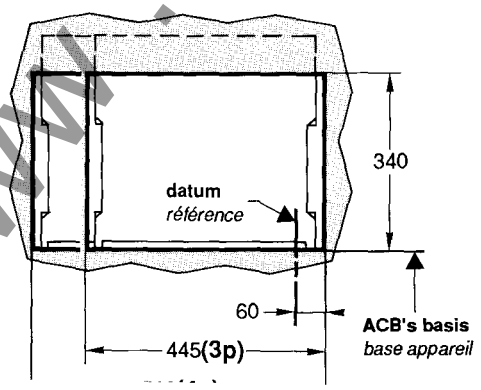
M32H/M40(3p)



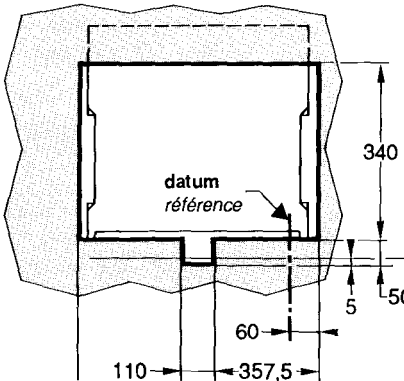
partitioning fixture
adaptation de cloisonnement
M40(4p)/M50/M63



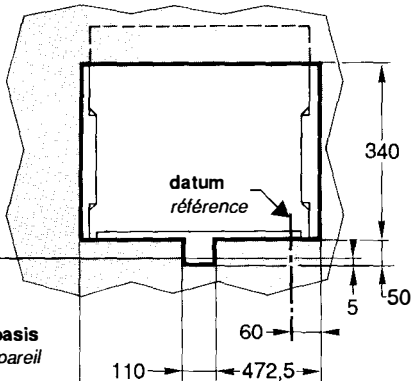
rear cutout
découpe fond case disjoncteur
M08 to/*à* M40(3p)



rear cutout
découpe fond case disjoncteur
M40(4p), M50(3p)

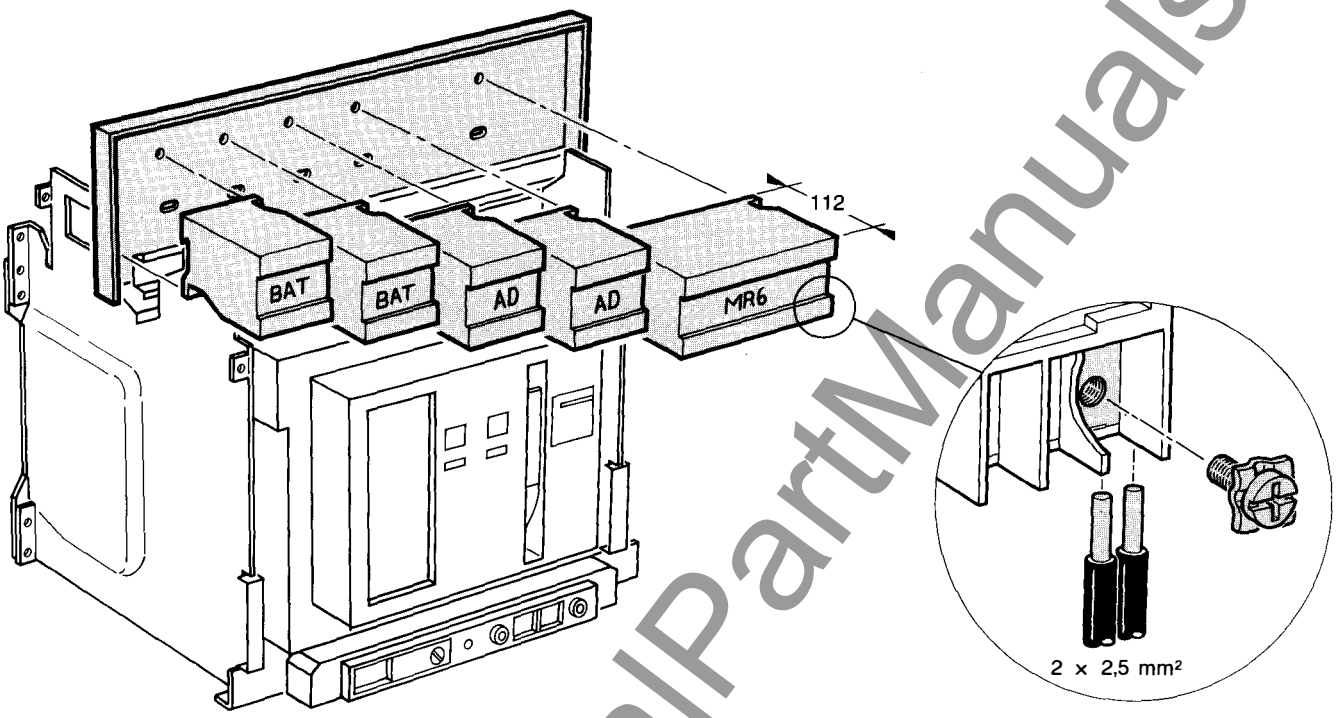


M50(4p), M63(3p), M63(4p)

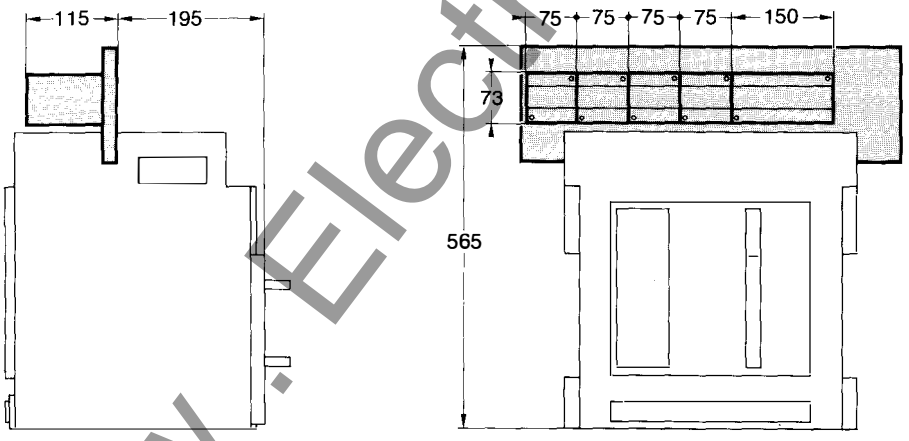


mounting of the modules
installation des modules

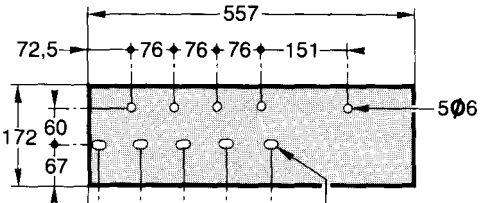
drawout breaker
version débrochable



dimensions of the modules and mounting plate
dimensions modules et plaques support d'adaptation



details of the support accessory
détail plaque support d'adaptation

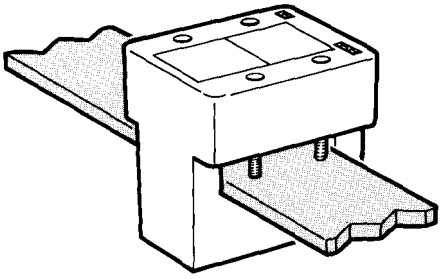


installation
Masterpact
M08 to/*à* M63

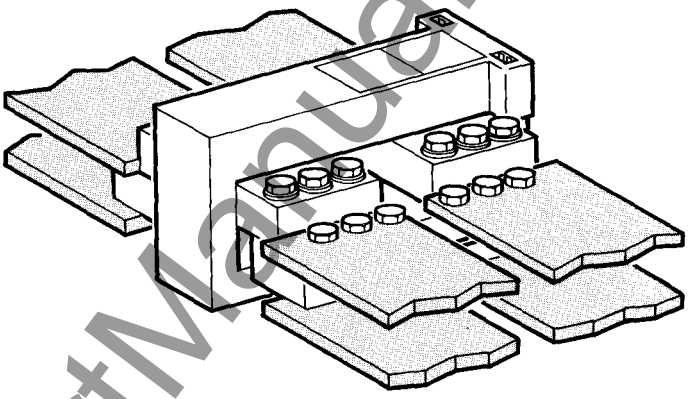
neutral current sensor
transformateur courant extérieur

installation
montage

≤ 2000A to/*à* 4000A

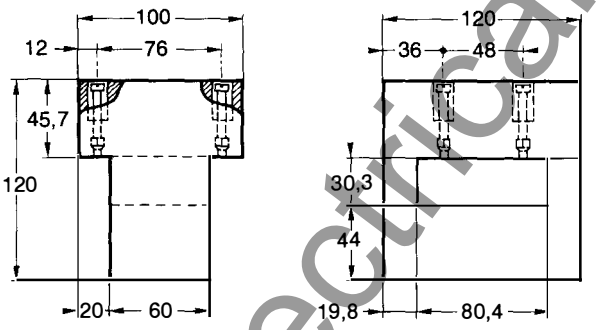


5000/6300A

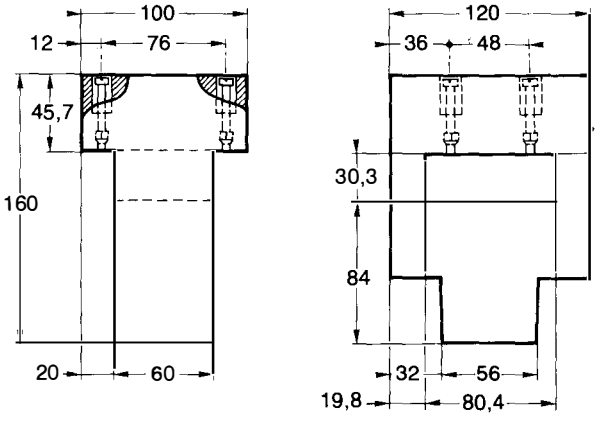


dimensions
dimensions

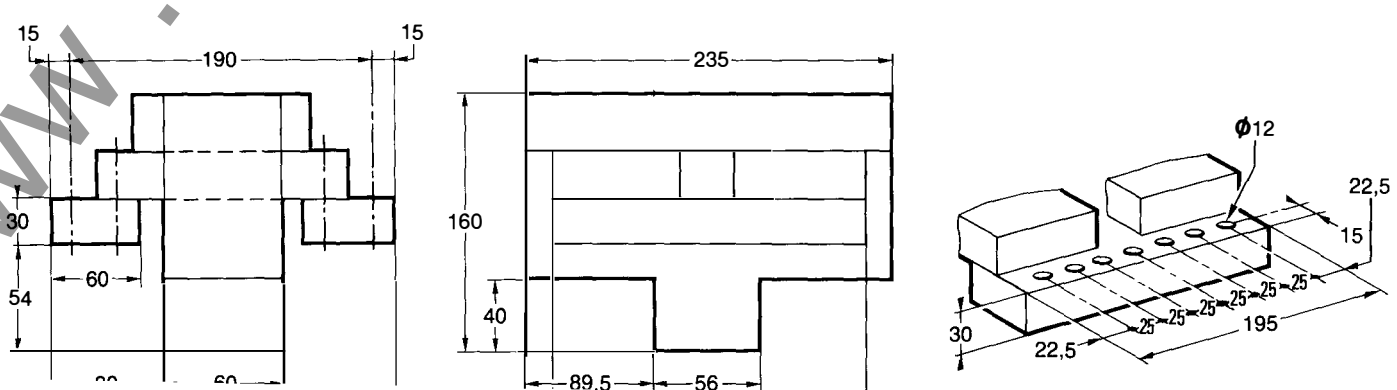
≤ 2000A



2500/3000/3200/4000A



5000/6300A



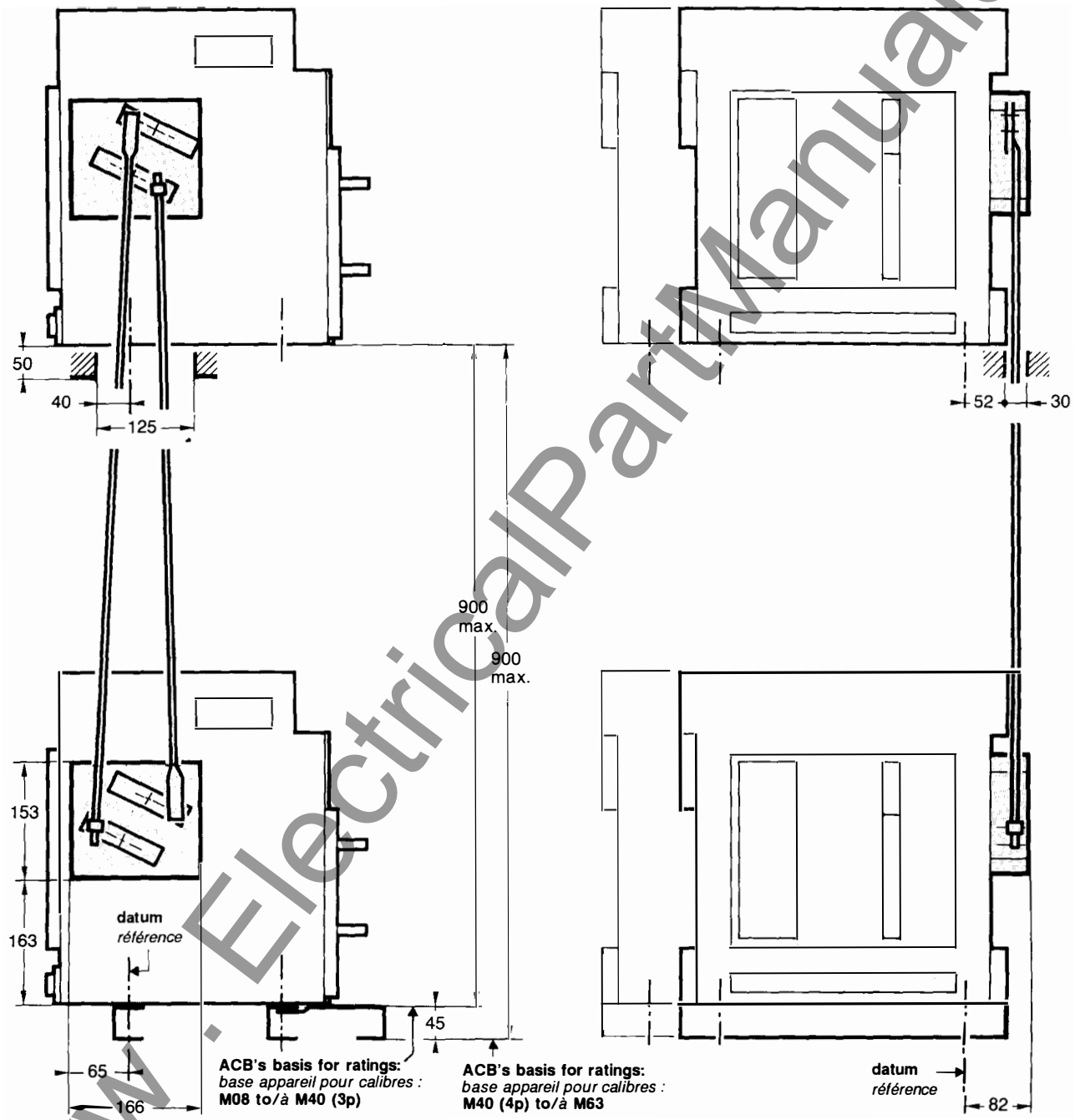
installation
Masterpact
M08 to/*à* M63

3 and 4 poles drawout pattern
3 et 4 pôles débrochable

mechanical interlock
for transfer switch
interverrouillage mécanique
pour inverseur de source

---

mechanical interlock for two circuit breakers
interverrouillage mécanique à deux appareils
VM 2CT



The minimum distance between 2 breakers is depending on the safety clearance.
La distance minimum entre 2 appareils est fonction du périmètre de sécurité.
Breakers alignement in respect of the fixing point of the interlocking side : ± 2mm

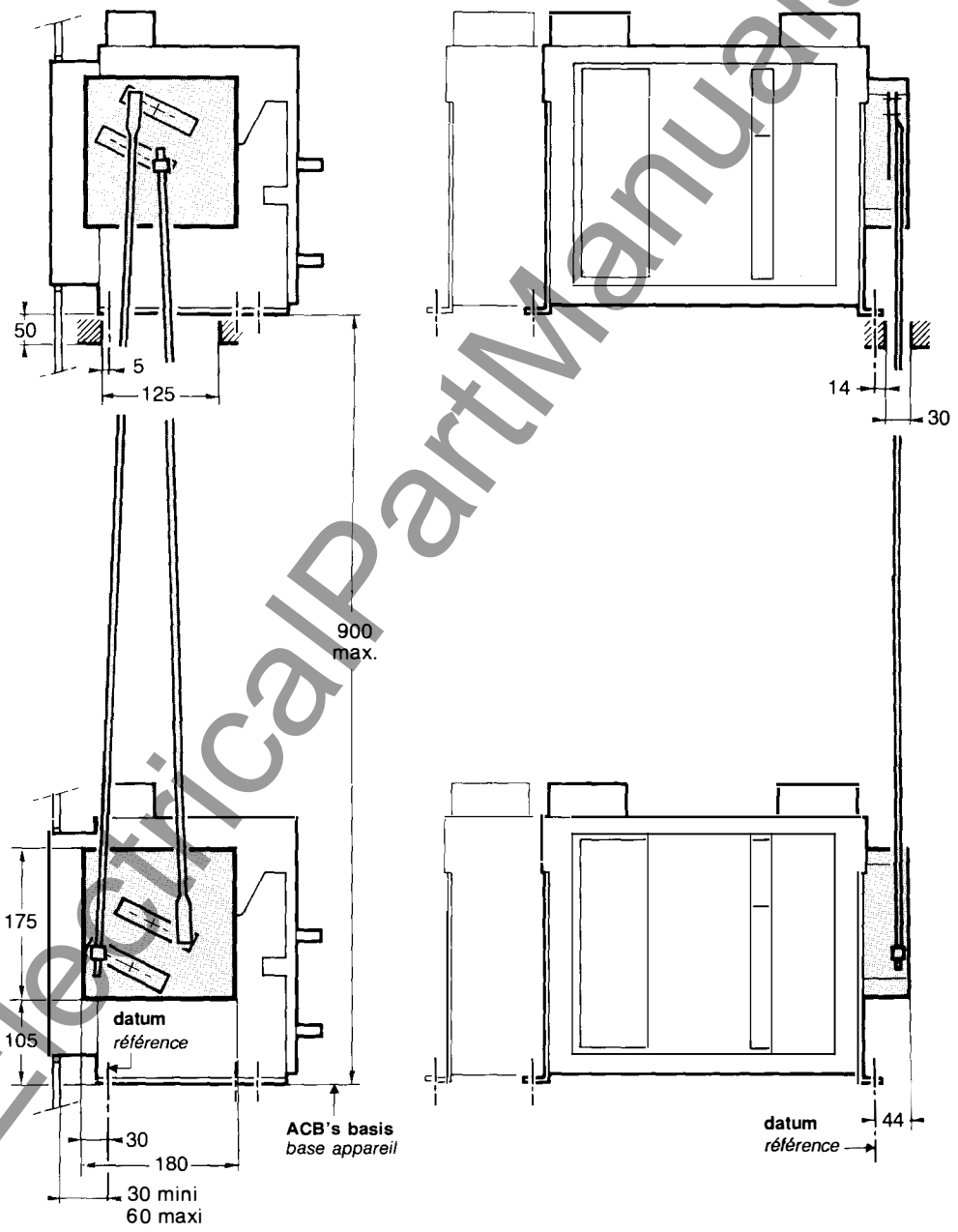
For other figures for installation and connection, please refer to breakers drawings
Pour toutes les autres cotes d'installation et raccordement

installation
Masterpact
M08 to/*à* M32

3 and 4 poles fixed or drawout pattern
3 et 4 pôles fixe ou débrochable

mechanical interlock
for transfer switch
interverrouillage mécanique
pour inverseur de source

mechanical interlock for two circuit breakers
interverrouillage mécanique à deux appareils
VM 2FT



The minimum distance between 2 breakers is depending on the safety clearance.
La distance minimum entre 2 appareils est fonction du périmètre de sécurité.
Breakers alignement in respect of the fixing point of the interlocking side : ± 2mm

For other figures for installation and connection, please refer to breakers drawings
Pour toutes les autres cotes d'installation et raccordement

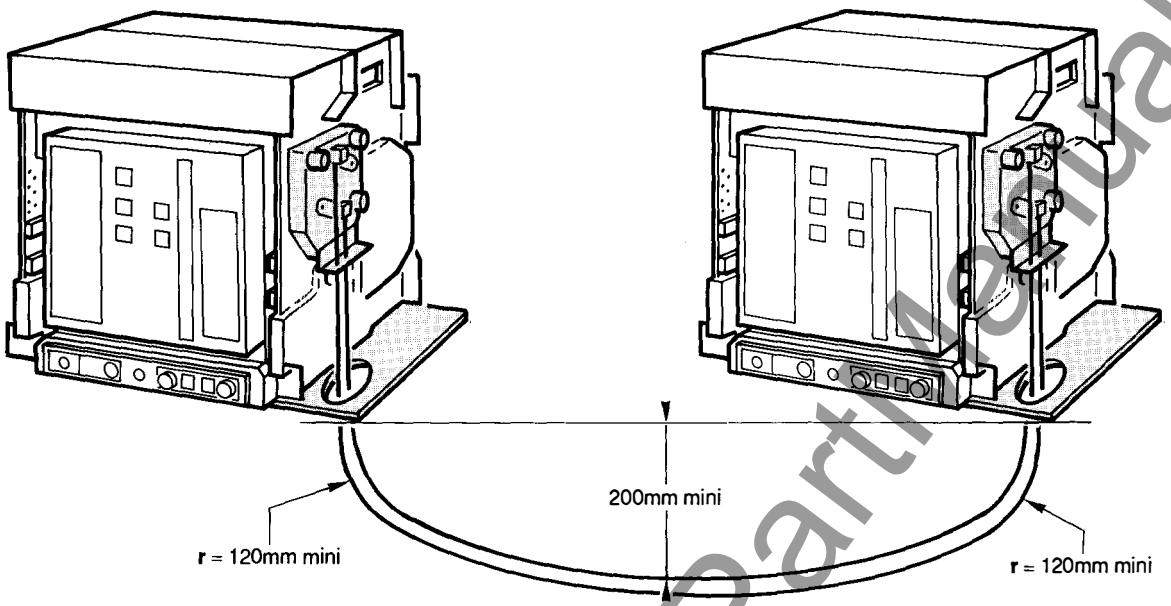
installation
Masterpact
M08 to/*à* M32

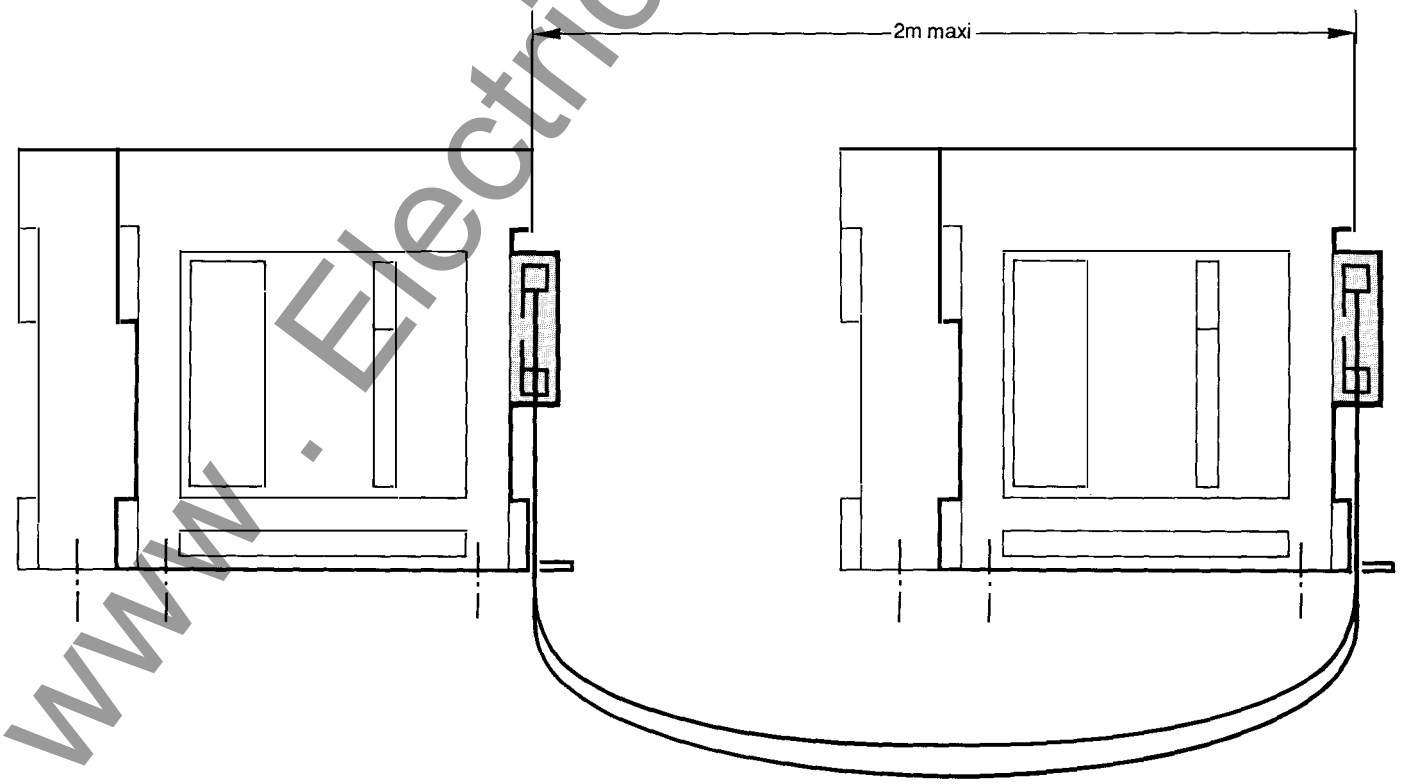
3 and 4 poles fixed or drawout pattern
3 et 4 pôles fixe ou débrochable

mechanical interlock
for transfer switch
interverrouillage mécanique
pour inverseur de source

---

mechanical interlock for two circuit breakers mounted side by side
interverrouillage mécanique à deux appareils montés côte à côte
VM 2CC





installation
Masterpact
M08 to/*à* M63

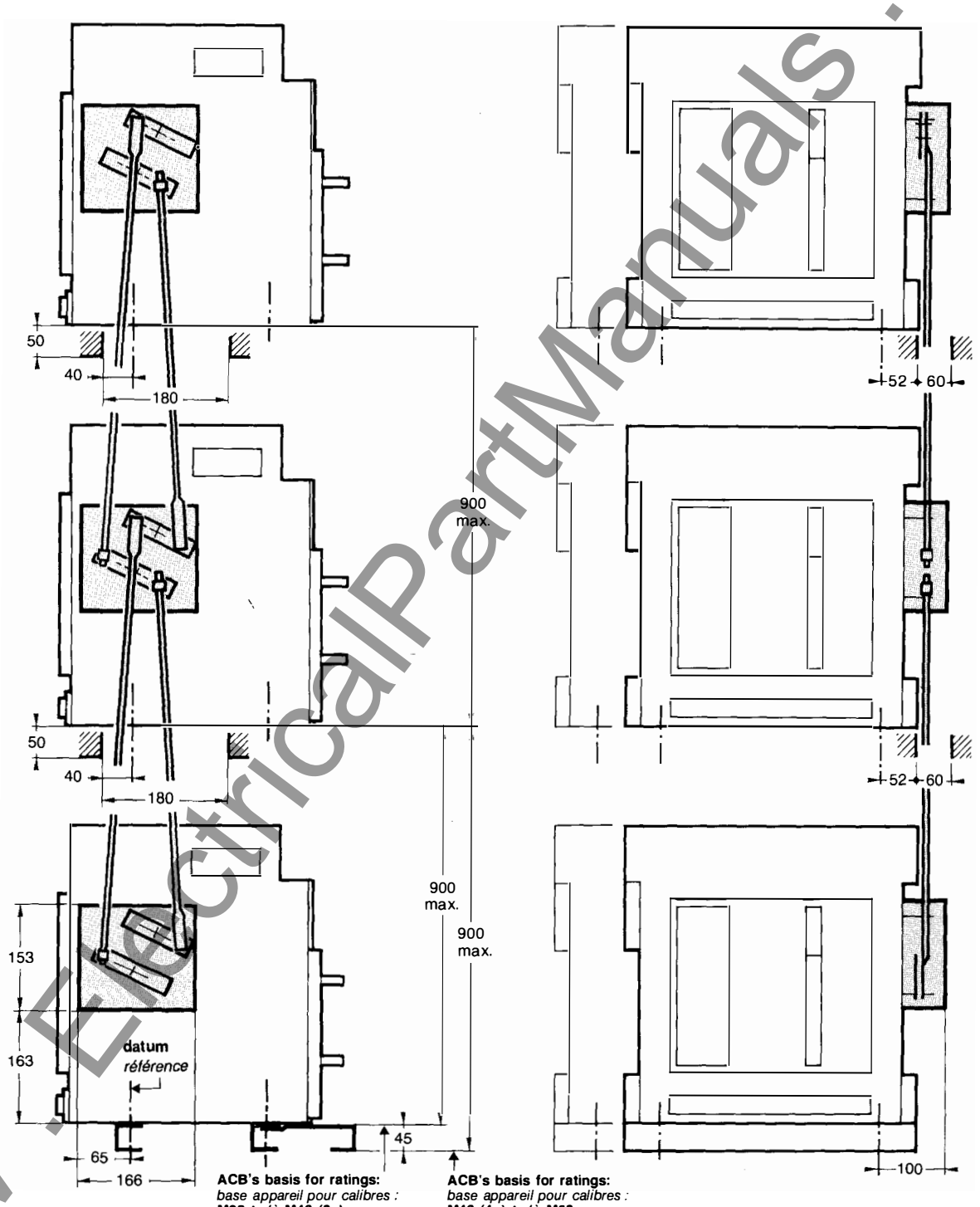
3 and 4 poles drawout pattern

3 et 4 pôles débrochable

mechanical interlock between three breakers

interverrouillage mécanique à trois appareils

VM 31CT-VM 32CT-VM 33CT



The minimum distance between 2 breakers is depending on the safety clearance.

La distance minimum entre 2 appareils est fonction du périmètre de sécurité.

Breakers alignement in respect of the fixing point of the interlocking side: ±2mm

Alignement des appareils par rapport aux références de fixation côté interverrouillage : ±2 mm

For other figures for installation and connection, please refer to breakers drawings.

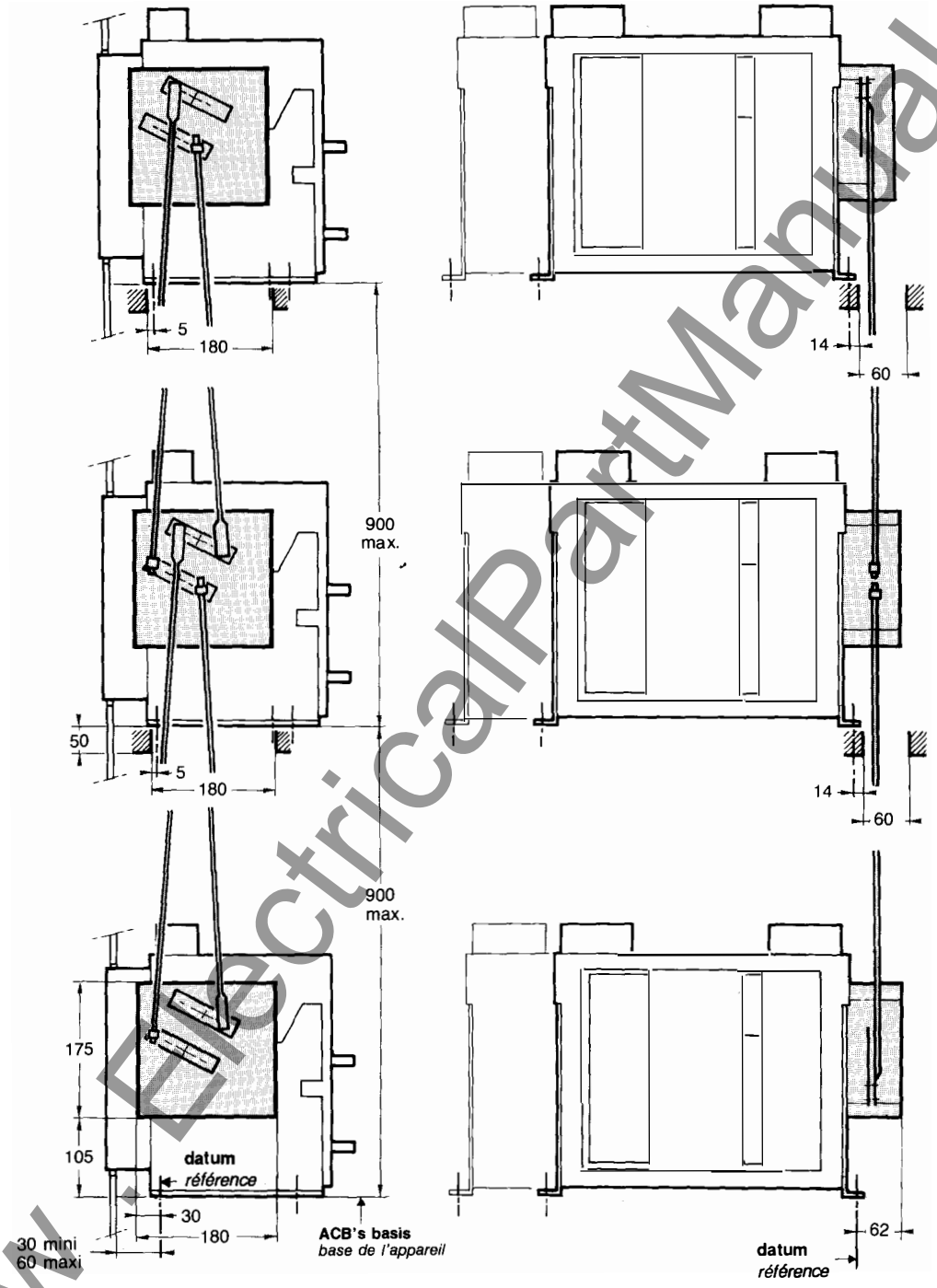
Pour toutes les autres cotes d'installation et raccordement, voir les plans des appareils.

installation
Masterpact
M08 to/*à* M32

3 and 4 poles fixed and drawout pattern
3 et 4 pôles fixe ou débrochable

mechanical interlock
between three breakers
interverrouillage mécanique
à trois appareils

VM 31FT-VM 32FT-VM 33FT



The minimum distance between 2 breakers is depending on the safety clearance.
La distance minimum entre 2 appareils est fonction du périmètre de sécurité.
Breakers alignement in respect of the fixing point of the interlocking side : ± 2mm

For other figures for installation and connection, please refer to breakers drawings
Pour toutes les autres cotes d'installation et

connection
raccordement
Masterpact
M08N-M10N-M12N

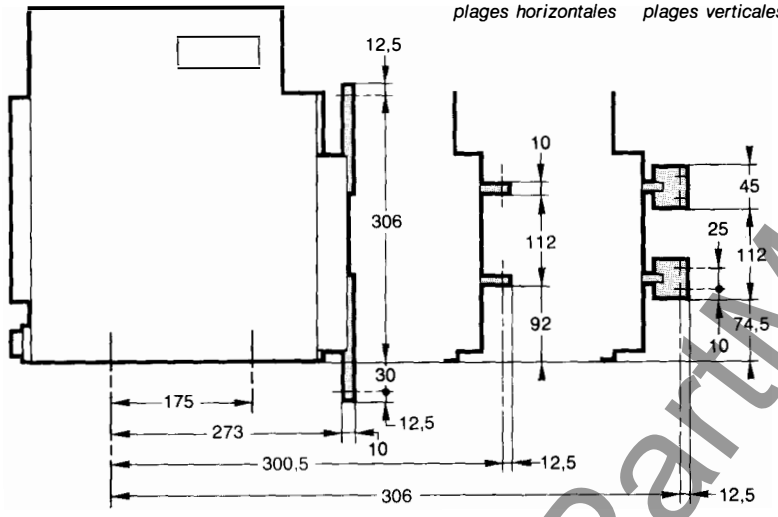
fixed, drawout pattern
fixe, débrochable

drawout pattern
débrochable

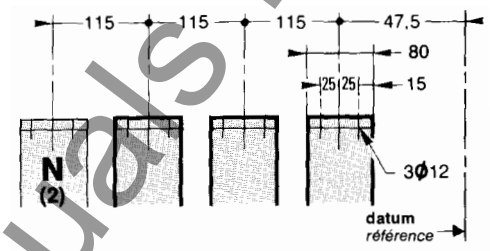
front connection (1)
prise avant (1)

rear connection
prise arrière

horizontal terminals **vertical terminals**
plages horizontales *plages verticales*

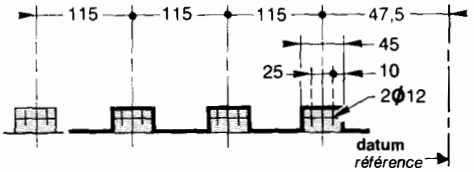


front connection (1)
prise avant (1)

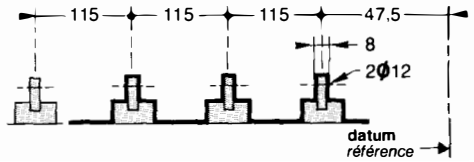


rear connection
prise arrière

horizontal terminals
plages horizontales



vertical terminals
plages verticales

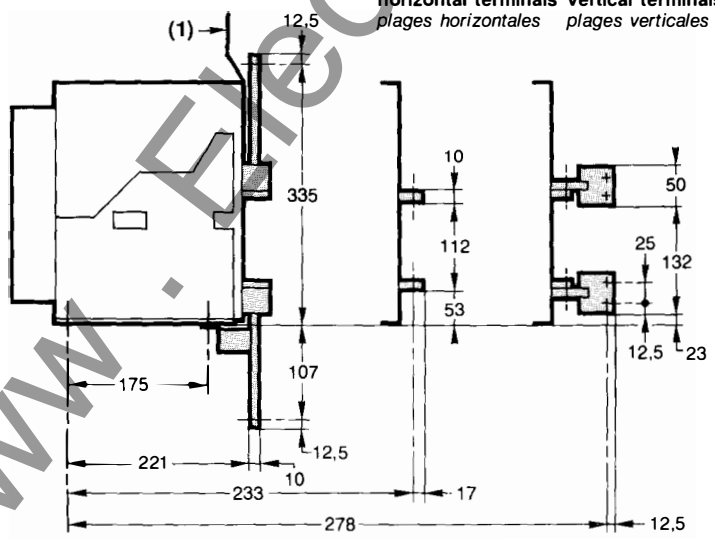


fixed pattern
fixe

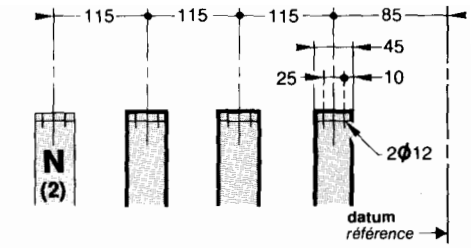
front connection (1)
prise avant (1)

rear connection
prise arrière

horizontal terminals **vertical terminals**
plages horizontales *plages verticales*

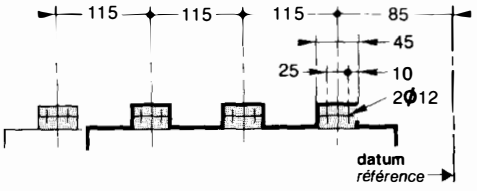


front connection (1)
prise avant (1)

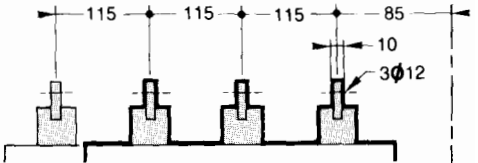


rear connection
prise arrière

horizontal terminals
plages horizontales

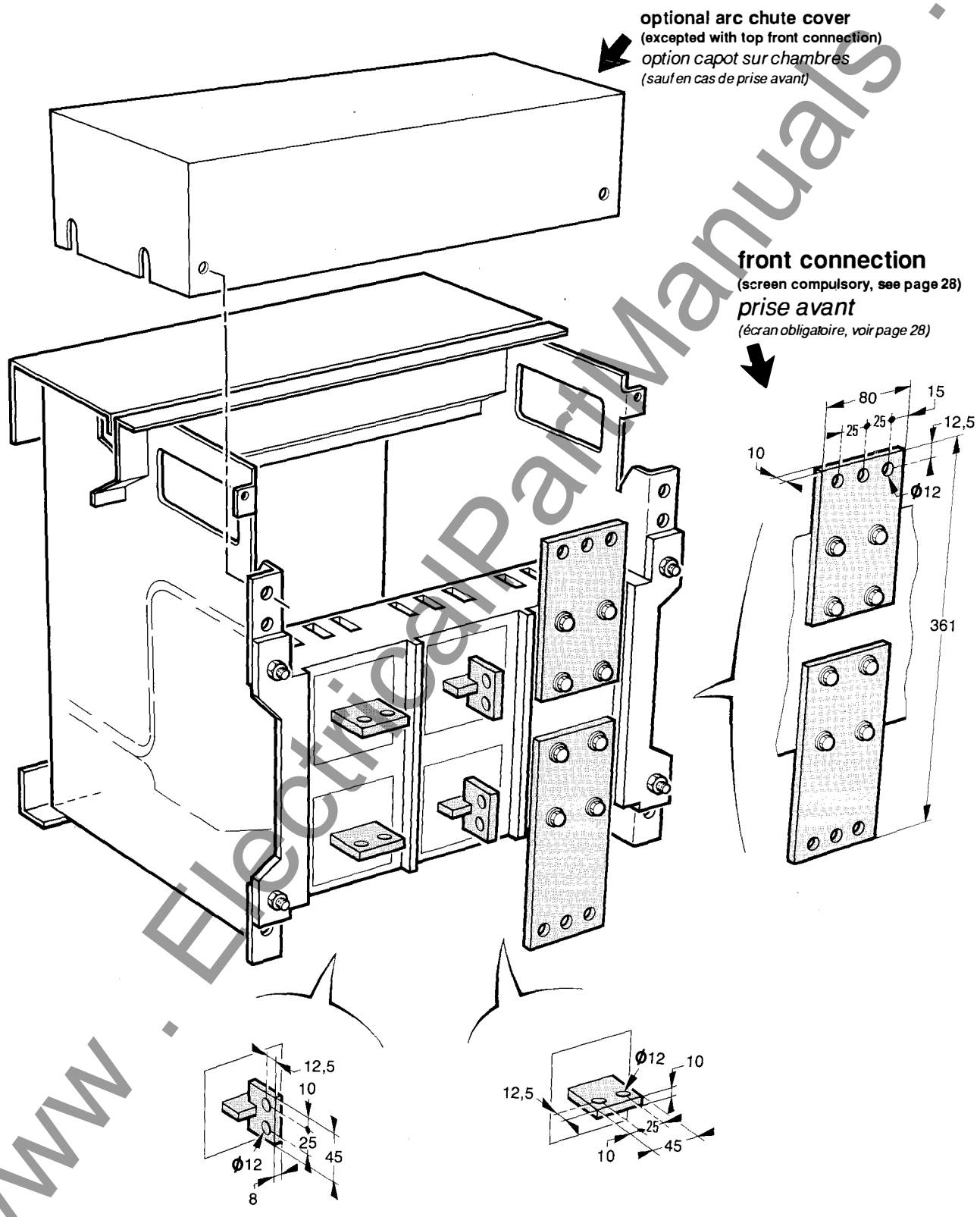


vertical terminals
plages verticales



connection
raccordement
Masterpact
M08N-M10N-M12N

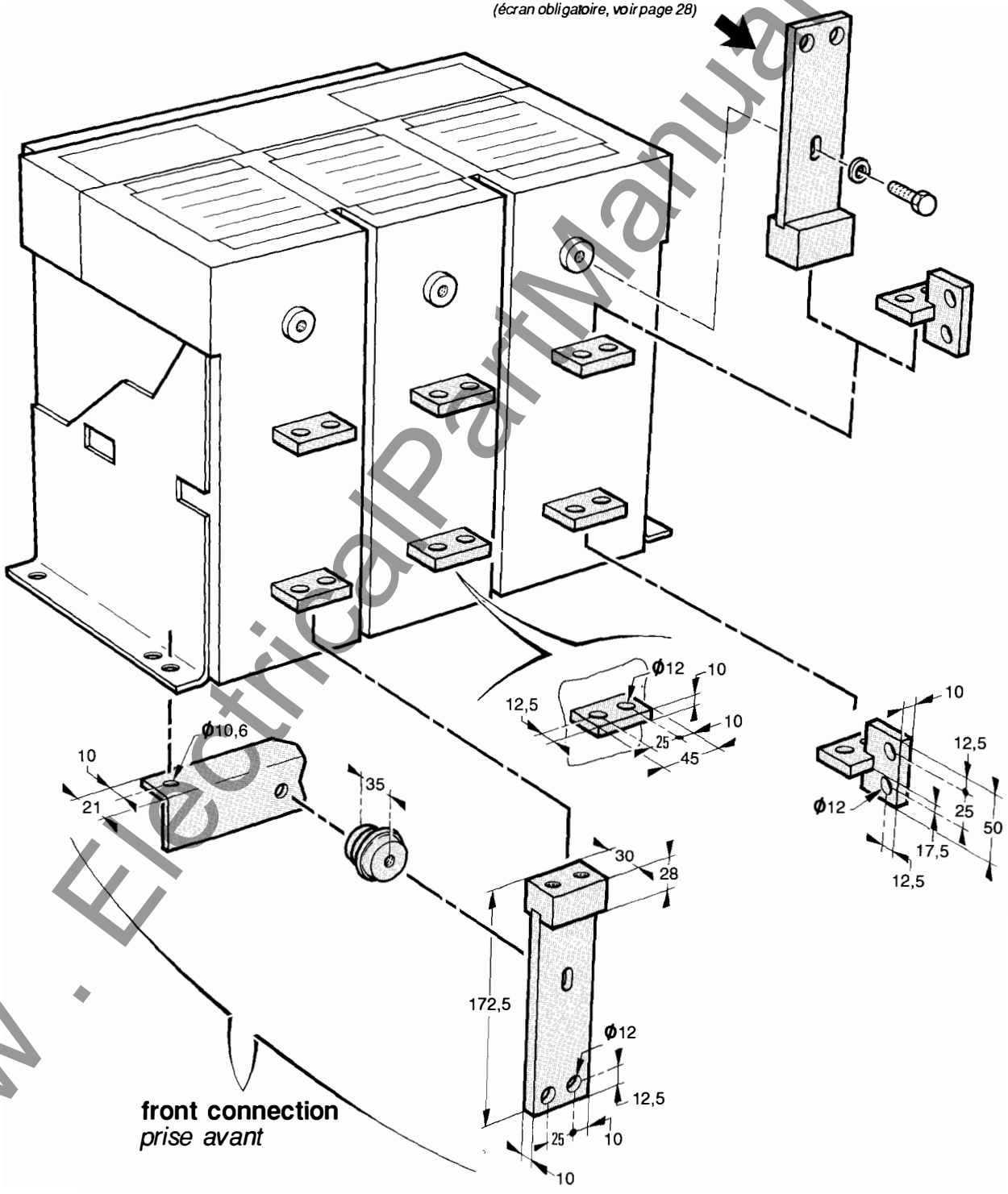
drawout pattern
horizontal or vertical terminals
and front connection
débrochable
plages horizontales ou verticales et
prise avant



connection
raccordement
Masterpact
M08N-M10N-M12N

fixed pattern
horizontal or vertical terminals and front connection
fixe
plages horizontales ou verticales et prise avant

front connection
(screen compulsory, see page 28)
prise avant
(écran obligatoire, voir page 28)

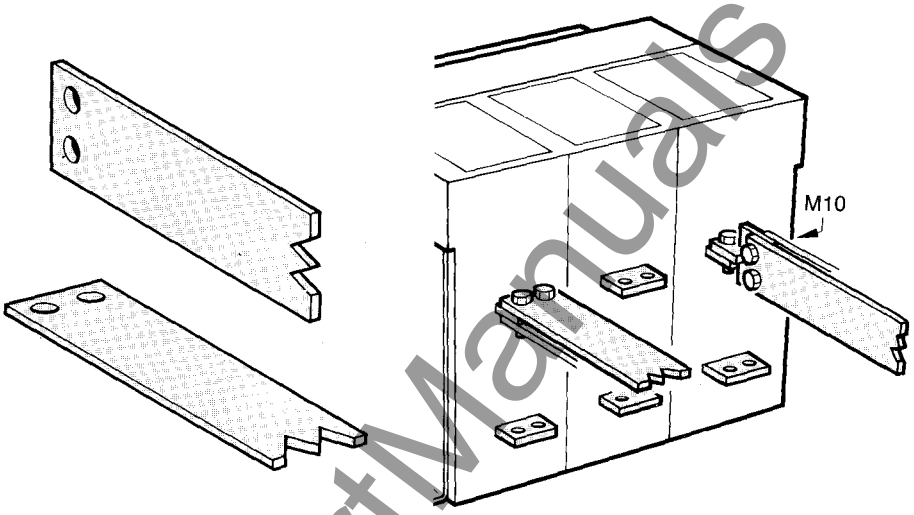


front connection
prise avant

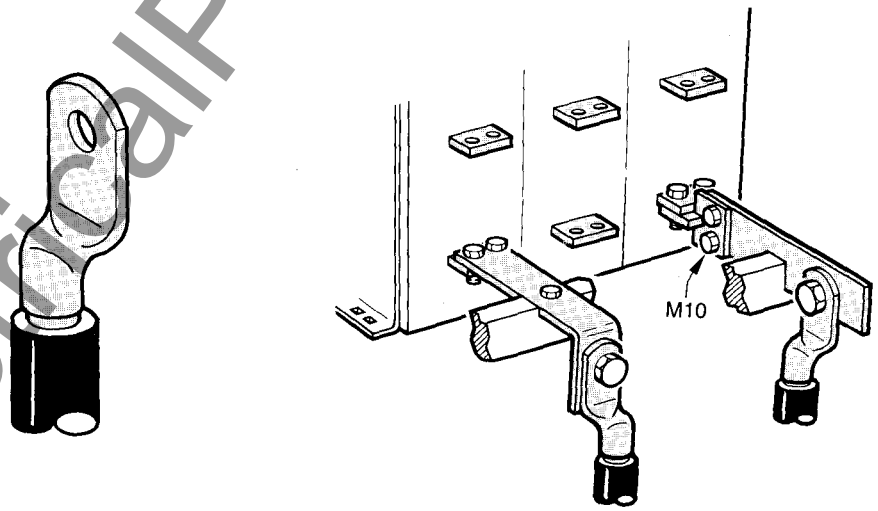
connection
raccordement
Masterpact
M08N-M10N-M12N

fixed or drawout pattern
horizontal connection
fixe ou débrochable
raccordement horizontal

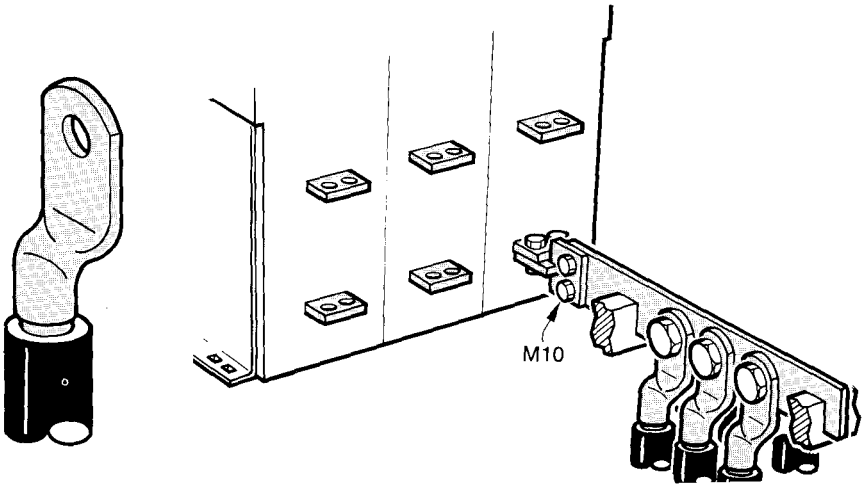
with or without vertical terminal
avec ou sans plage complémentaire



with busbar extension + support
avec queue de barre + support



with busbar extension + supports
avec queue de barre + supports

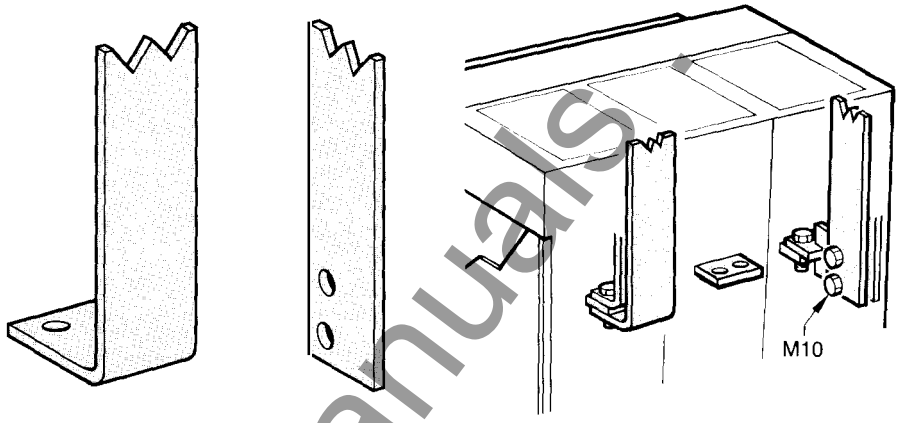


connection
raccordement
Masterpact
M08N-M10N-M12N

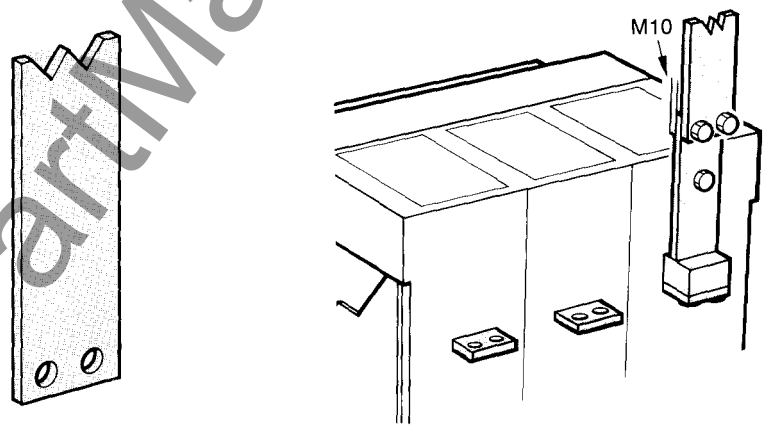
fixed or drawout pattern
vertical connection
fixe ou débrochable
raccordement vertical

fixed pattern
fixe

with or without vertical terminal (1)
avec ou sans plage complémentaire (1)

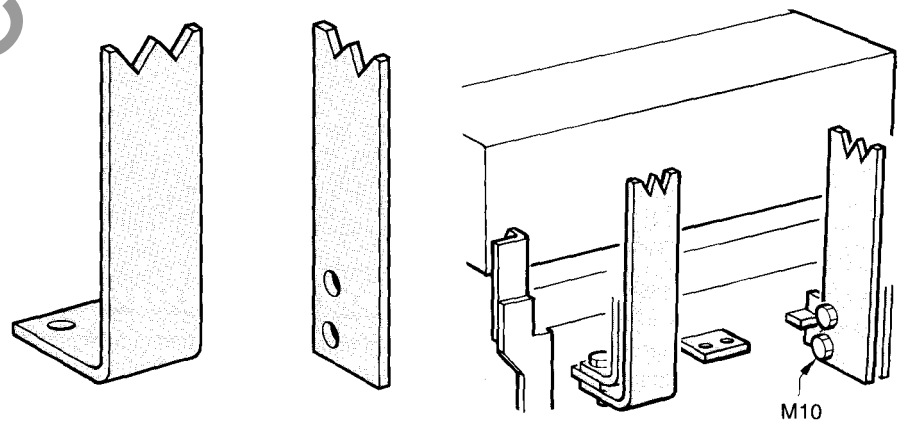


with front connection (2)
avec prise avant (2)

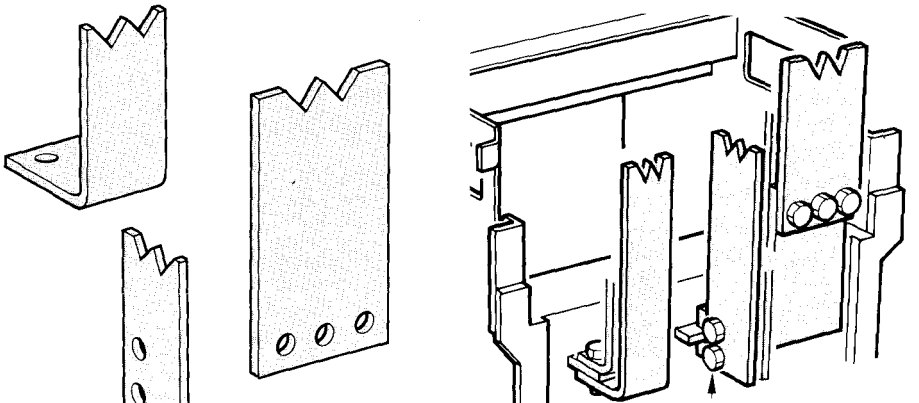


drawout pattern
débrochable

with arc chute cover
with or without vertical terminal (1)
avec capot sur chambres
avec ou sans plage complémentaire (1)



without arc chute cover
with or without vertical terminal (1)
+ front connection (2)
sans capot sur chambres
avec ou sans plage complémentaire (1)
+ prise avant (2)



(1): screen necessary (see safety perimeters)
écran nécessaire (cf. · périmètre de sécurité)

connection
raccordement
Masterpact
M08H/L-M10H/L
M12H/L-M16N/H/L

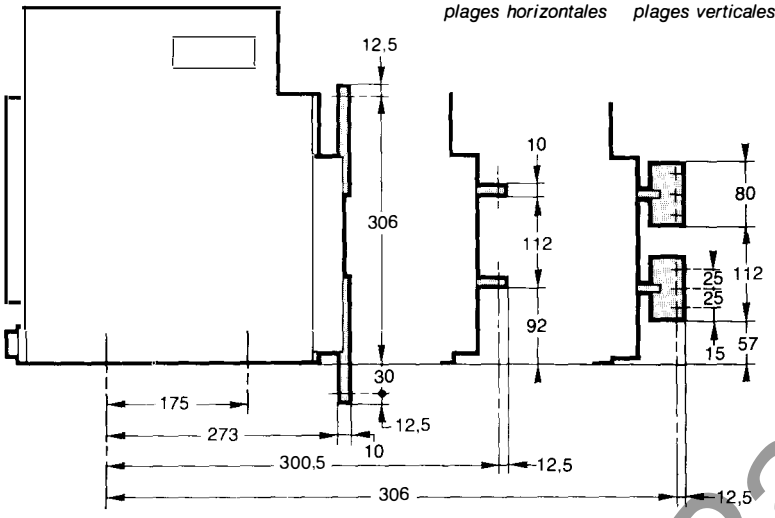
fixed, drawout pattern
fixe, débrochable

drawout pattern
débrochable

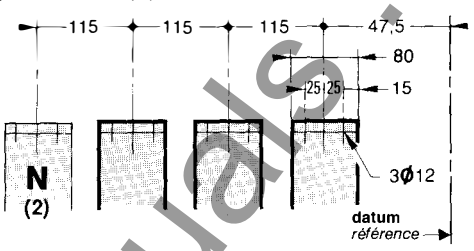
front connection (1)
prise avant (1)

rear connection
prise arrière

horizontal terminals *plages horizontales*
vertical terminals *plages verticales*

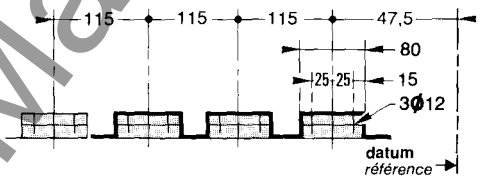


front connection (1)
prise avant (1)

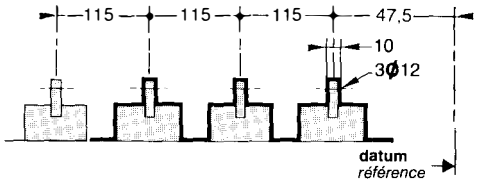


rear connection
prise arrière

horizontal terminals
plages horizontales



vertical terminals
plages verticales

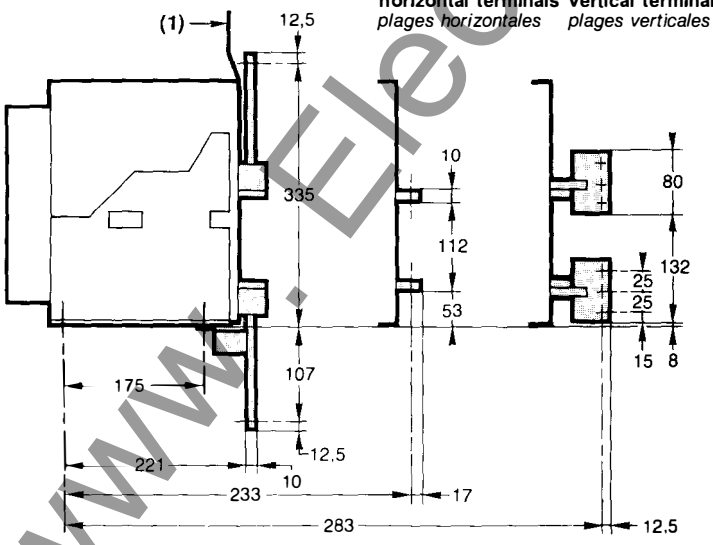


fixed pattern
fixe

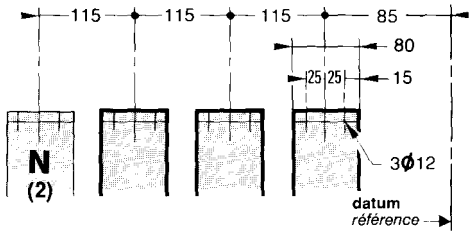
front connection (1)
prise avant (1)

rear connection
prise arrière

horizontal terminals *plages horizontales*
vertical terminals *plages verticales*

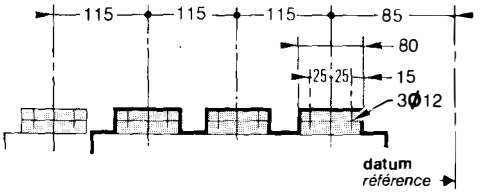


front connection (1)
prise avant (1)

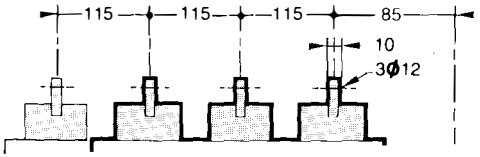


rear connection
prise arrière

horizontal terminals
plages horizontales



vertical terminals
plages verticales



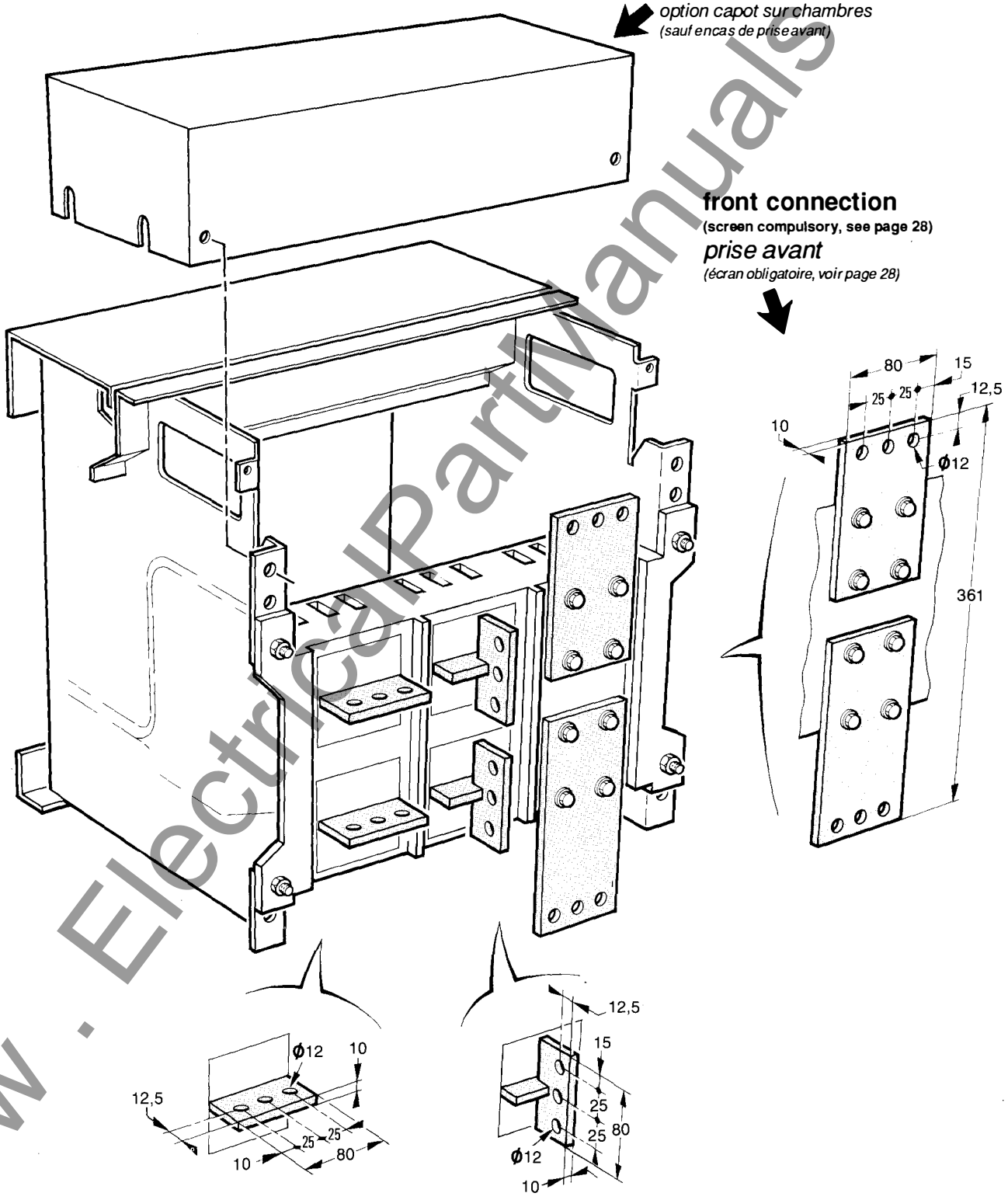
(1) : front connection screen compulsory

connection
raccordement
Masterpact
M08H/L-M10H/L
M12H/L-M16N/H/L

drawout pattern
horizontal or vertical terminals
and front connection
débrochable
plages horizontales ou verticales
et prise avant

optional arc chute cover
(excepted with top front connection)
option capot sur chambres
(sauf encas de prise avant)

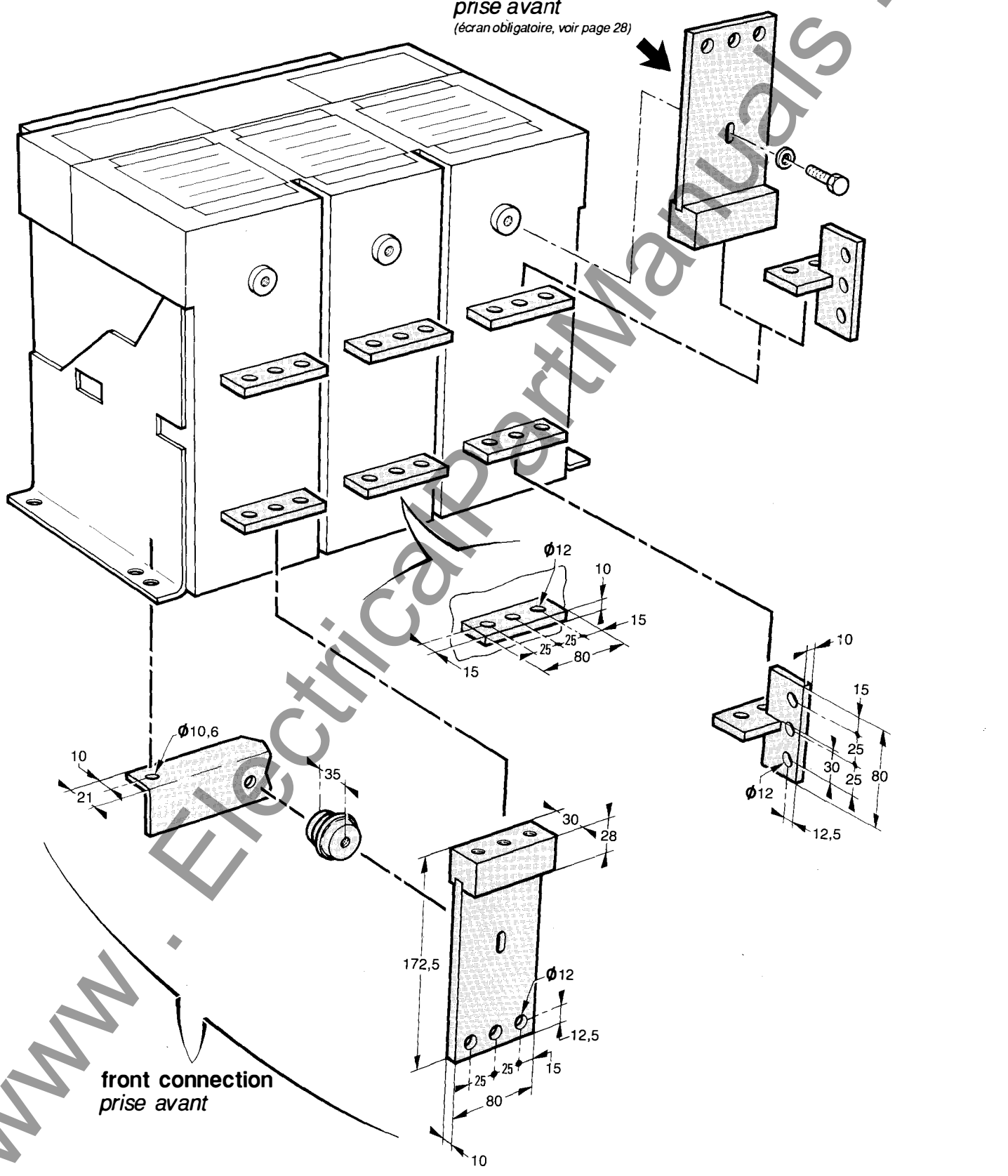
front connection
(screen compulsory, see page 28)
prise avant
(écran obligatoire, voir page 28)



connection
raccordement
Masterpact
M08H/L-M10H/L
M12H/L-M16N/H/L

fixed pattern
horizontal or vertical terminals
and front connection
fixe
plages horizontales ou verticales
et prise avant

front connection
(screen compulsory, see page 28)
prise avant
(écran obligatoire, voir page 28)

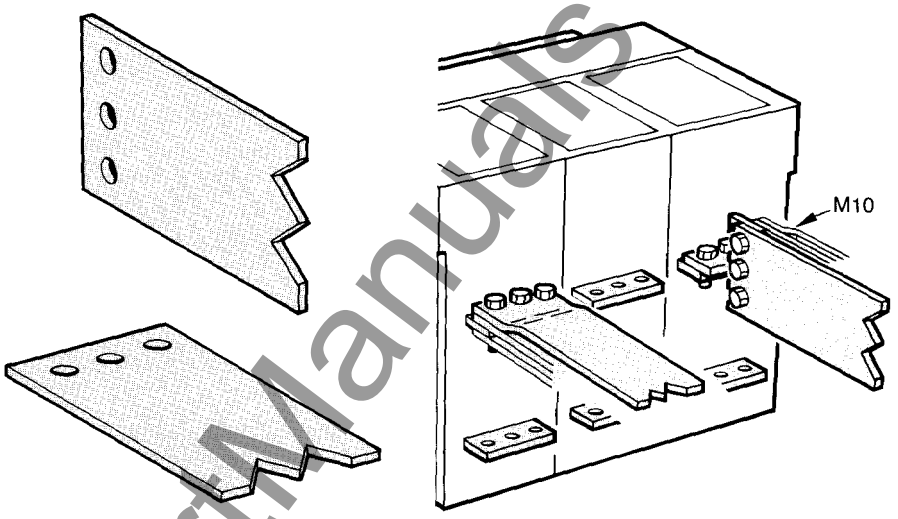


front connection
prise avant

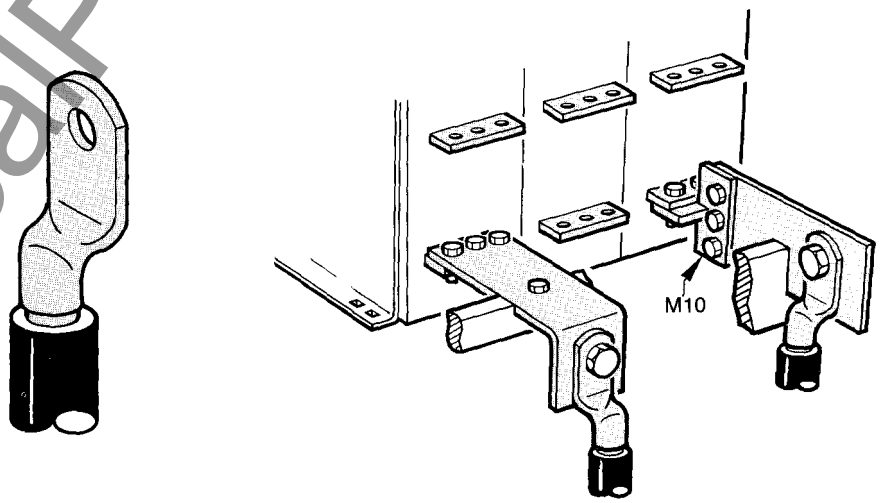
connection
raccordement
Masterpact
M08H/L-M10H/L
M12H/L-M16N/H/L

fixed or drawout pattern
horizontal connection
fixe ou débrochable
raccordement horizontal

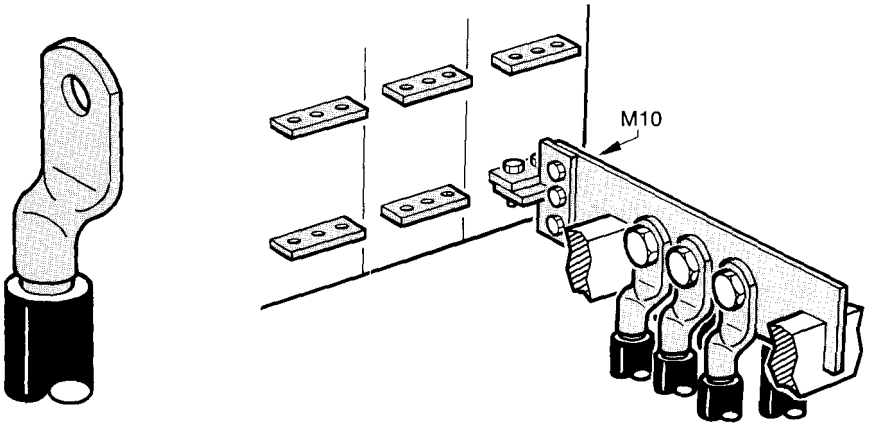
with or without vertical terminal
avec ou sans plage complémentaire



with busbar extension + support
avec queue de barre + support



with busbar extension + supports
avec queue de barre + supports

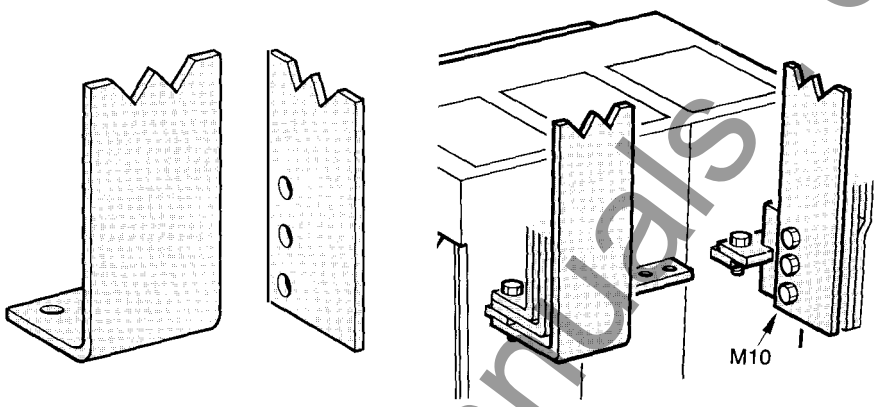


connection
raccordement
Masterpact
M08H/L-M10H/L
M12H/L-M16N/H/L

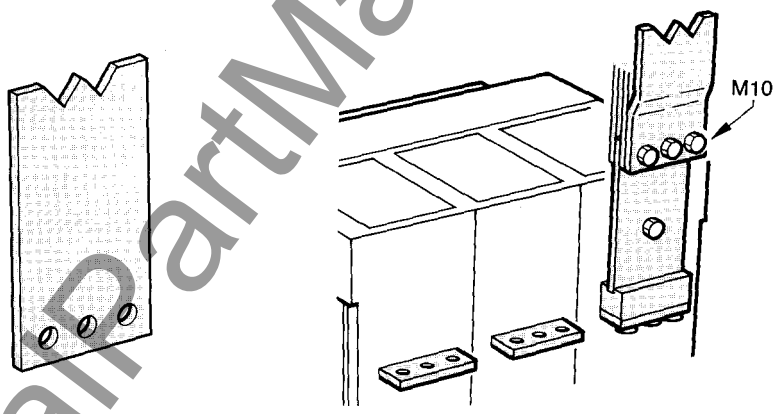
fixed or drawout pattern
vertical connection
fixe ou débrochable
raccordement vertical

fixed pattern
fixe

with or without vertical terminal (1)
avec ou sans plage complémentaire (1)

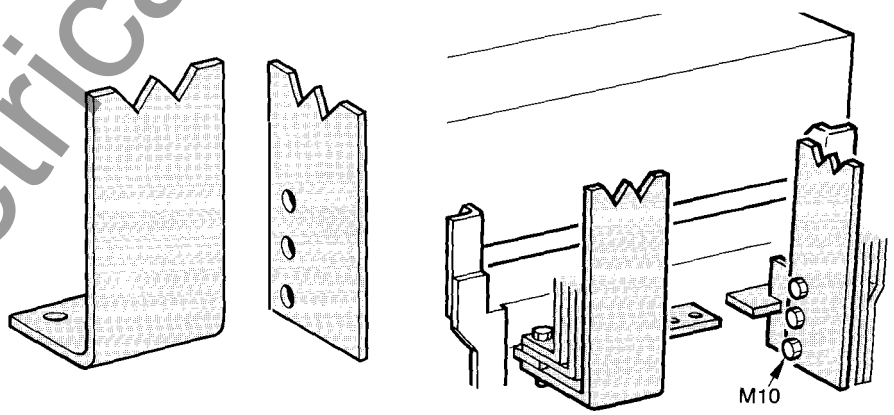


with front connection (2)
avec prise avant (2)

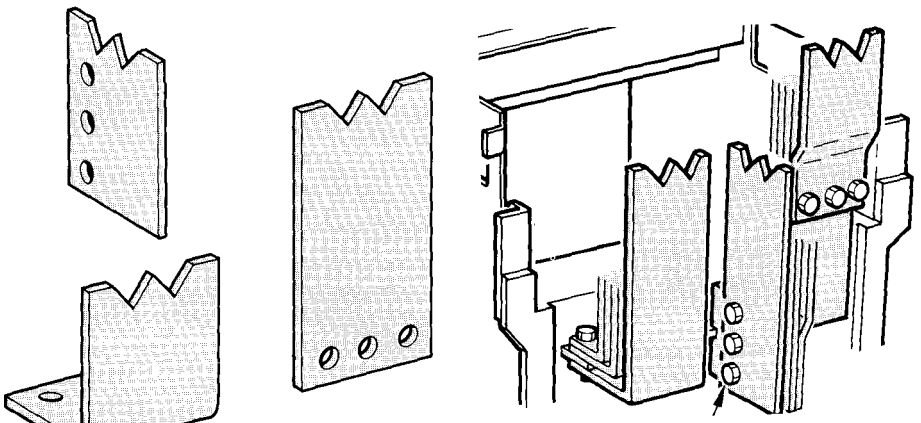


drawout pattern
débrochable

with arc chute cover
with or without vertical terminal (1)
avec capot sur chambres
avec ou sans plage complémentaire (1)



without arc chute cover
with or without vertical terminal (1)
+ front connection (2)
sans capot sur chambres
avec ou sans plage complémentaire (1)
+ prise avant (2)



(1): screen necessary (see safety perimeters)
écran nécessaire (cf. : périmètre de sécurité)
(2): front connection screen compulsory

connection
raccordement
Masterpact
M20N/H-M25N/H

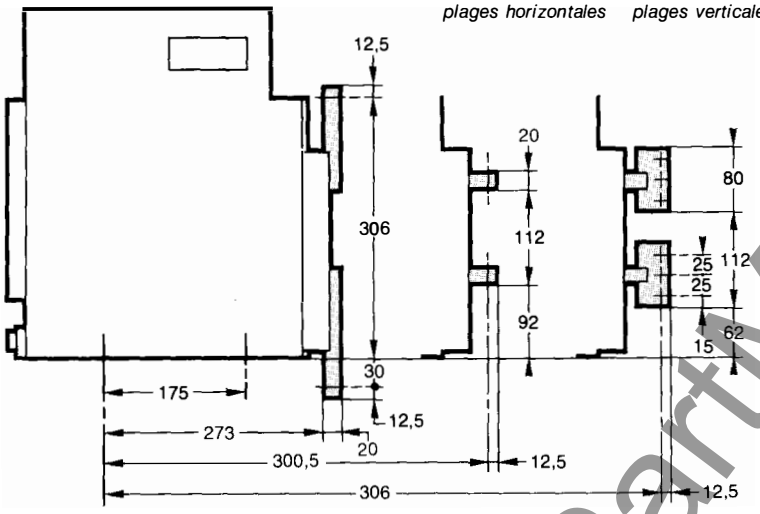
fixed, drawout pattern
fixe, débrochable

drawout pattern
débrochable

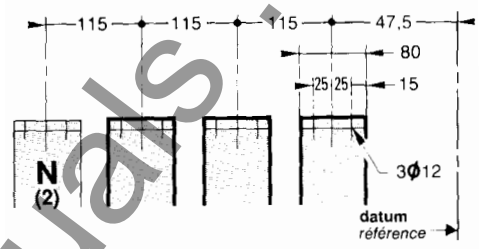
front connection (1)
prise avant (1)

rear connection
prise arrière

horizontal terminals *plages horizontales*
vertical terminals *plages verticales*

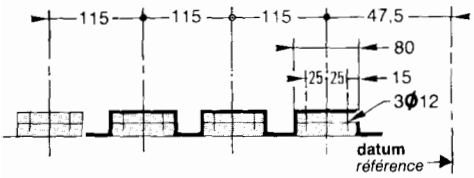


front connection (1)
prise avant (1)



rear connection
prise arrière

horizontal terminals
plages horizontales



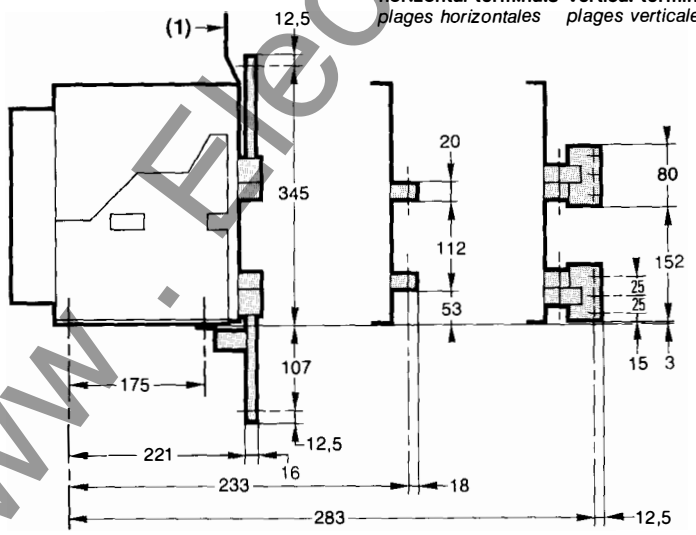
vertical terminals
plages verticales

fixed pattern
fixe

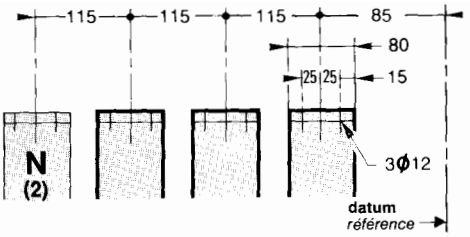
front connection (1)
prise avant (1)

rear connection
prise arrière

horizontal terminals *plages horizontales*
vertical terminals *plages verticales*

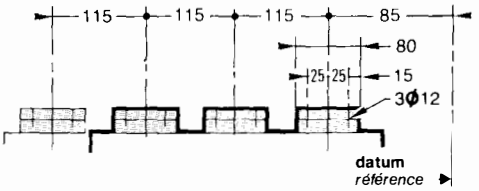


front connection (1)
prise avant (1)

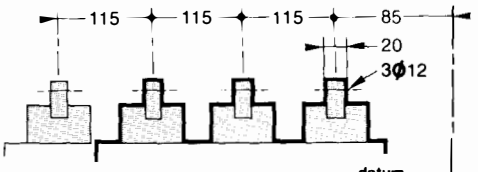


rear connection
prise arrière

horizontal terminals
plages horizontales

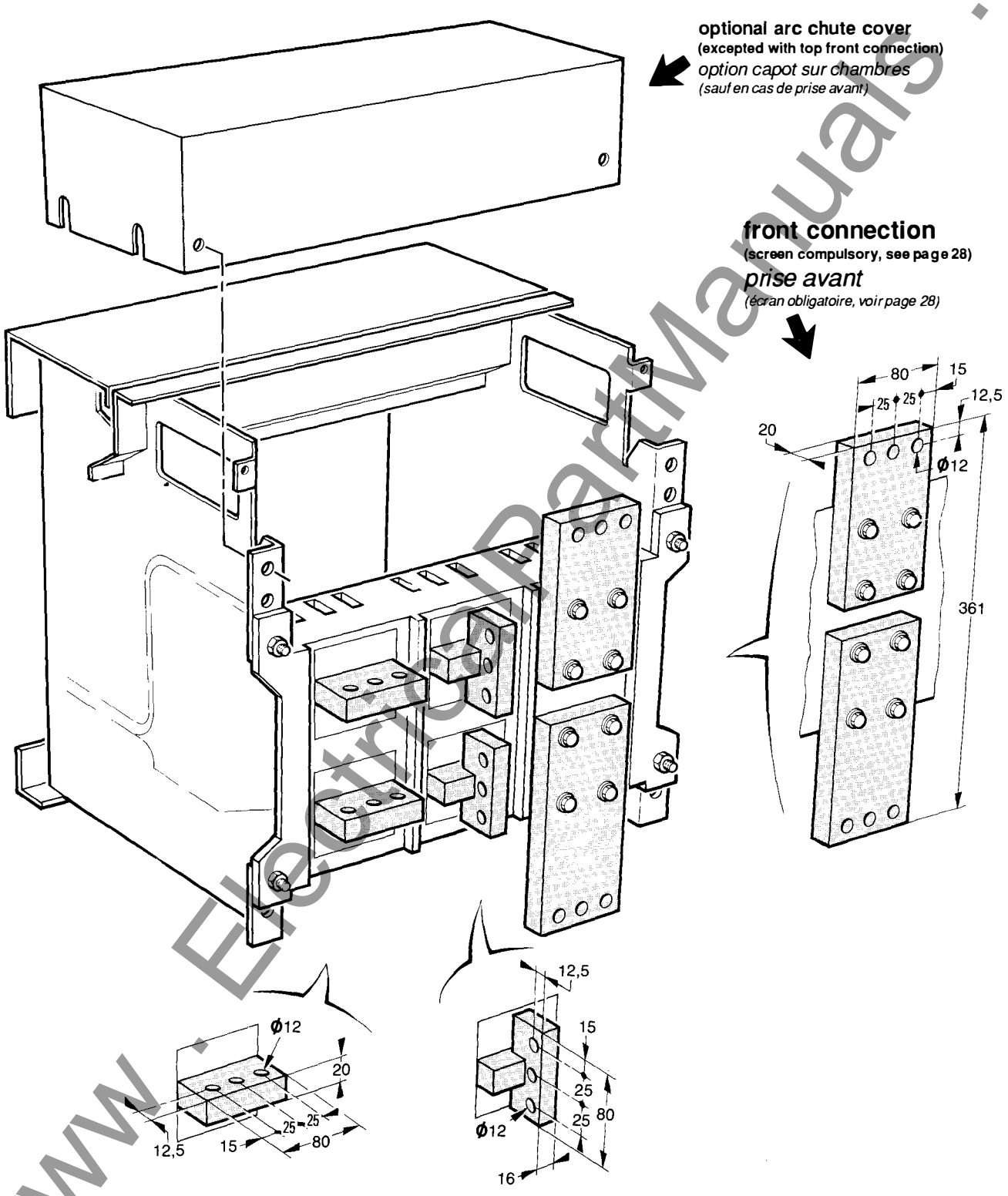


vertical terminals
plages verticales



connection
raccordement
Masterpact
M20N/H-M25N/H

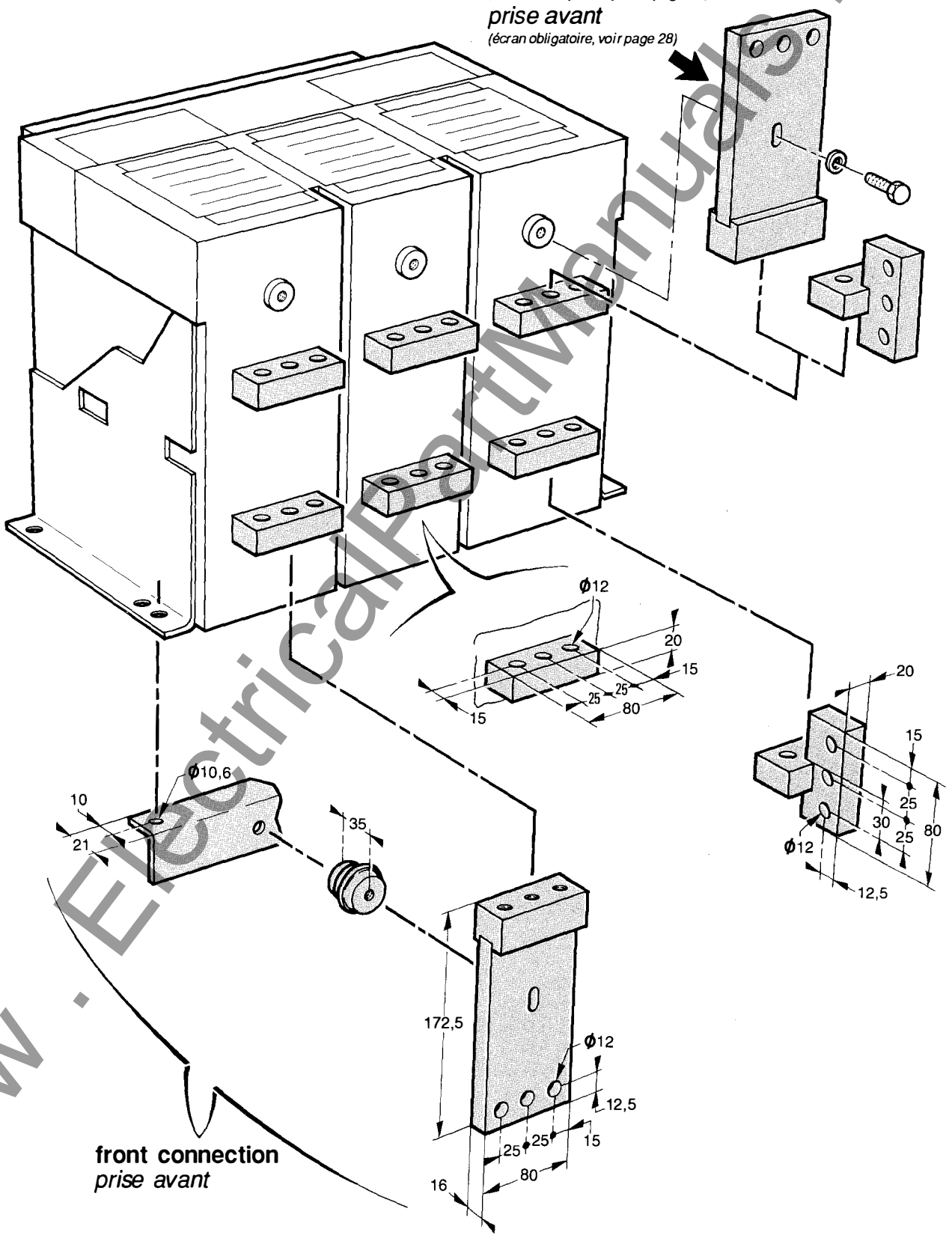
drawout pattern
horizontal or vertical terminals
and front connection
débrochable
plages horizontales ou verticales
et prise avant



connection
raccordement
Masterpact
M20N/H-M25N/H

fixed pattern
horizontal or vertical terminals
and front connection
fixe
plages horizontales ou verticales
et prise avant

front connection
(screen compulsory, see page 28)
prise avant
(écran obligatoire, voir page 28)

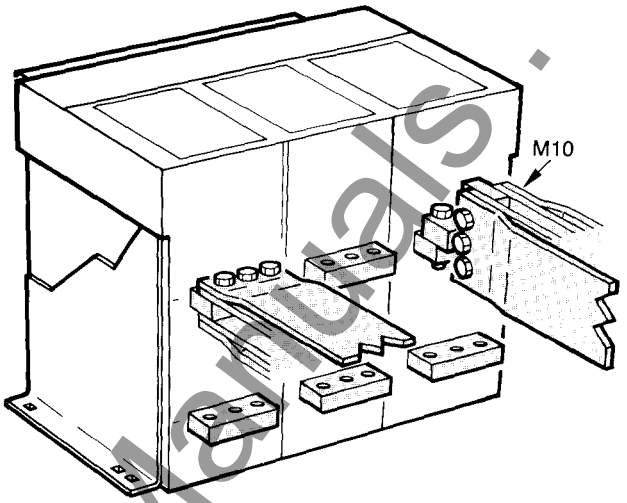


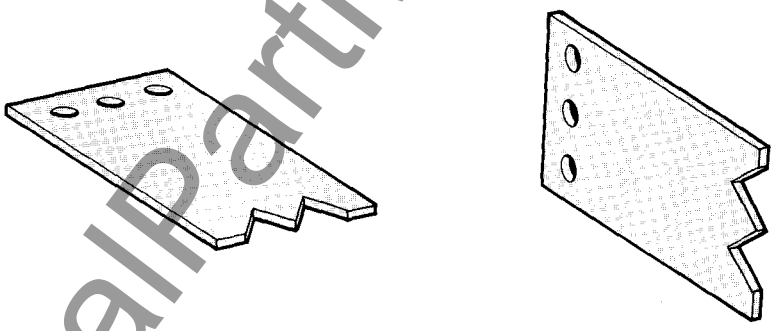
front connection
prise avant

connection
raccordement
Masterpact
M20N/H-M25N/H

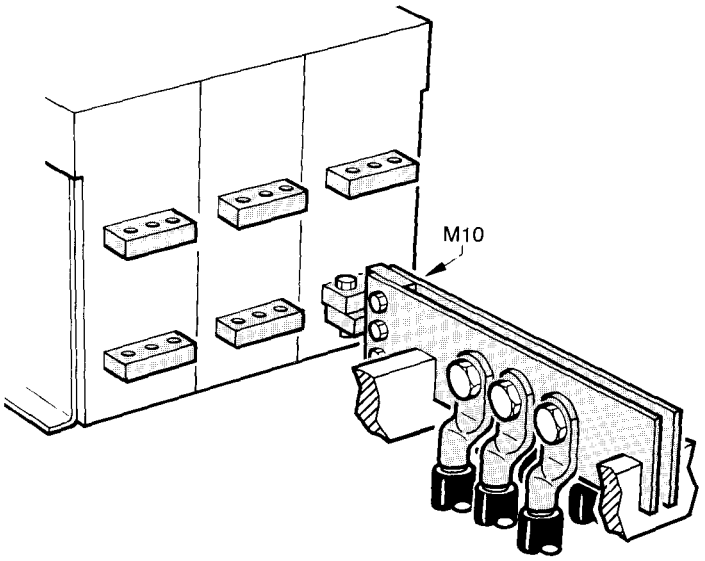
fixed or drawout pattern
horizontal connection
fixe ou débrochable
raccordement horizontal

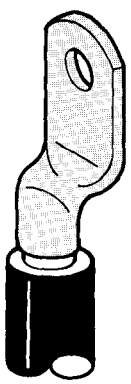
with or without vertical terminal
avec ou sans plage complémentaire





with busbar extension + supports
avec queue de barre + supports



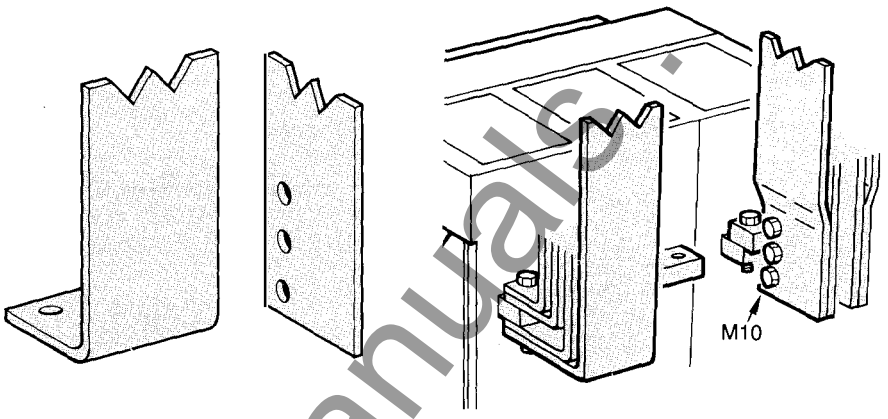


connection
raccordement
Masterpact
M20N/H-M25N/H

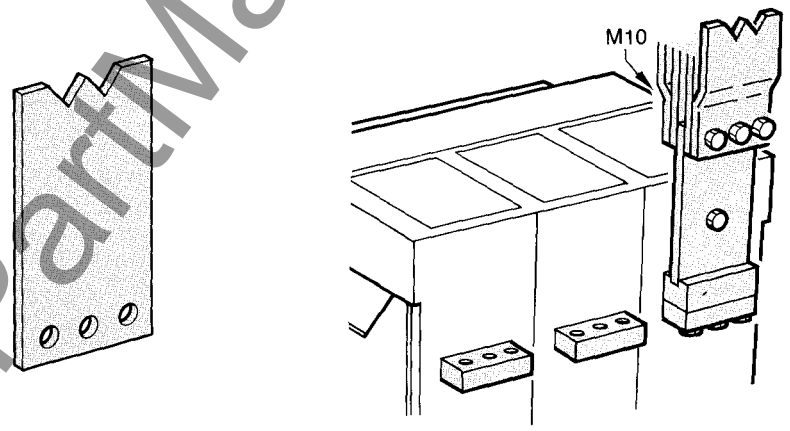
fixed or drawout pattern
vertical connection
fixe ou débrochable
raccordement vertical

fixed pattern
fixe

with or without vertical terminal (1)
avec ou sans plage complémentaire (1)

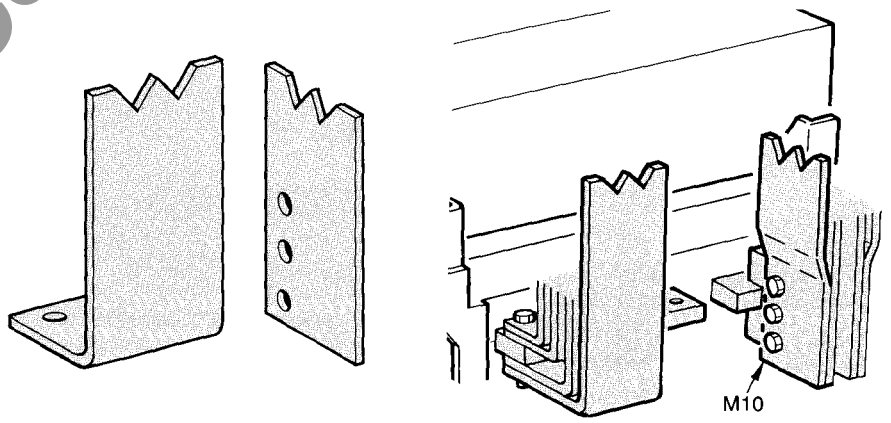


with front connection (2)
avec prise avant (2)

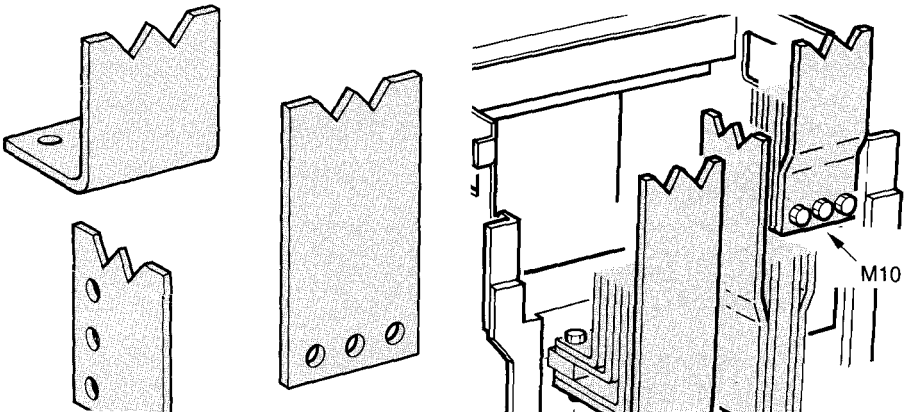


drawout pattern
débrochable

with arc chute cover
with or without vertical terminal (1)
avec capot sur chambres
avec ou sans plage complémentaire (1)



without arc chute cover
with or without vertical terminal (1)
+ front connection (2)
sans capot sur chambres
avec ou sans plage complémentaire (1)
+ prise avant (2)



(1): screen necessary (see safety perimeters)
écran nécessaire (cf. : périmètre de sécurité)

connection
raccordement
Masterpact
M20L-M25L-M32H

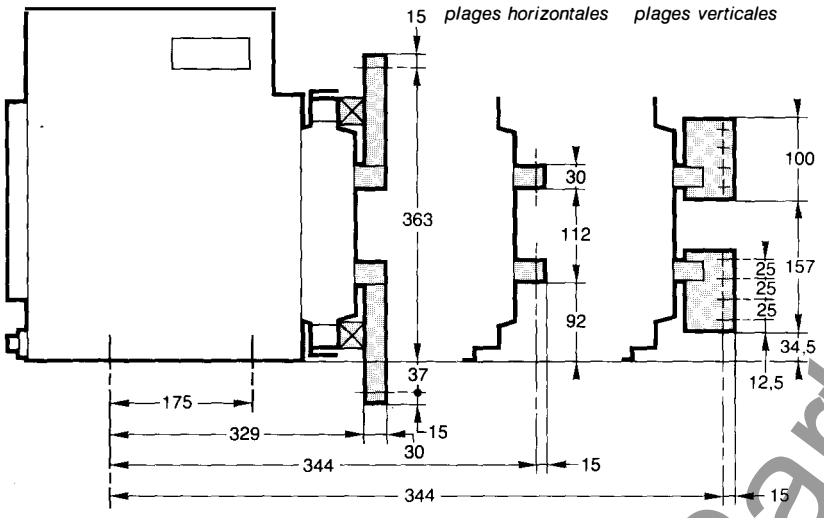
fixed, drawout pattern
fixe, débrochable

drawout pattern
débrochable

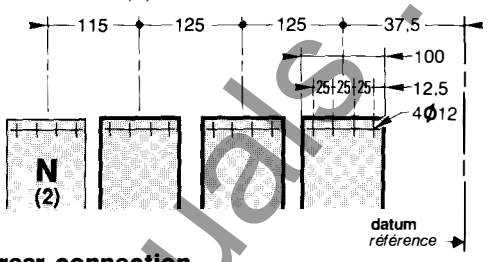
front connection (1)
prise avant (1)

rear connection
prise arrière

horizontal terminals *plages horizontales*
vertical terminals *plages verticales*

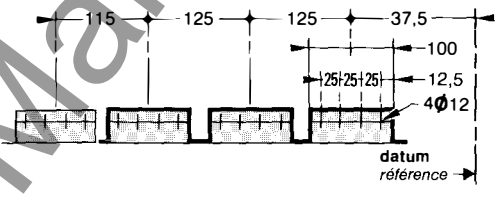


front connection (1)
prise avant (1)

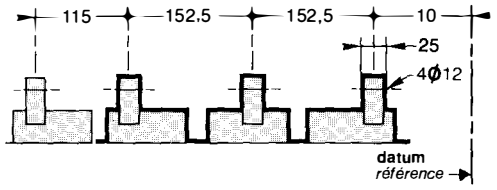


rear connection
prise arrière

horizontal terminals
plages horizontales



vertical terminals
plages verticales

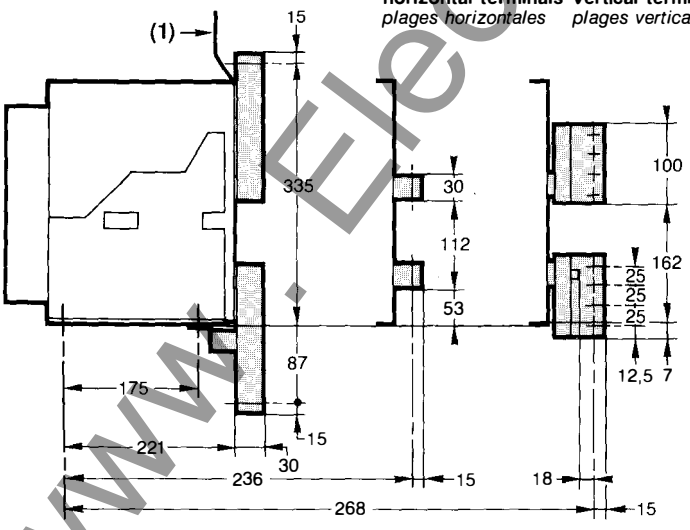


fixed pattern
fixe

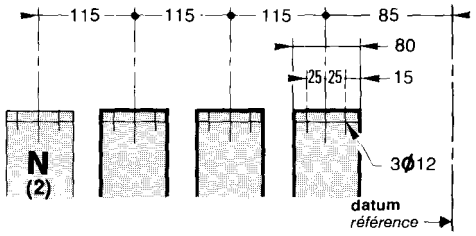
front connection (1)
prise avant (1)

rear connection
prise arrière

horizontal terminals *plages horizontales*
vertical terminals *plages verticales*

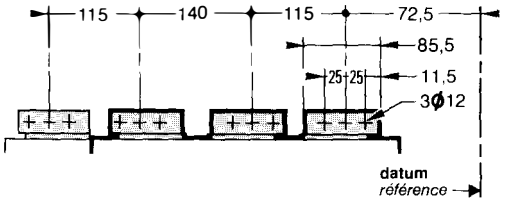


front connection (1)
prise avant (1)

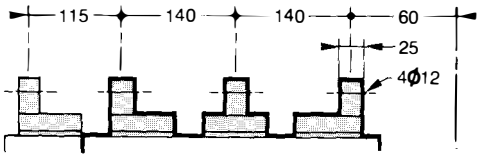


rear connection
prise arrière

horizontal terminals
plages horizontales

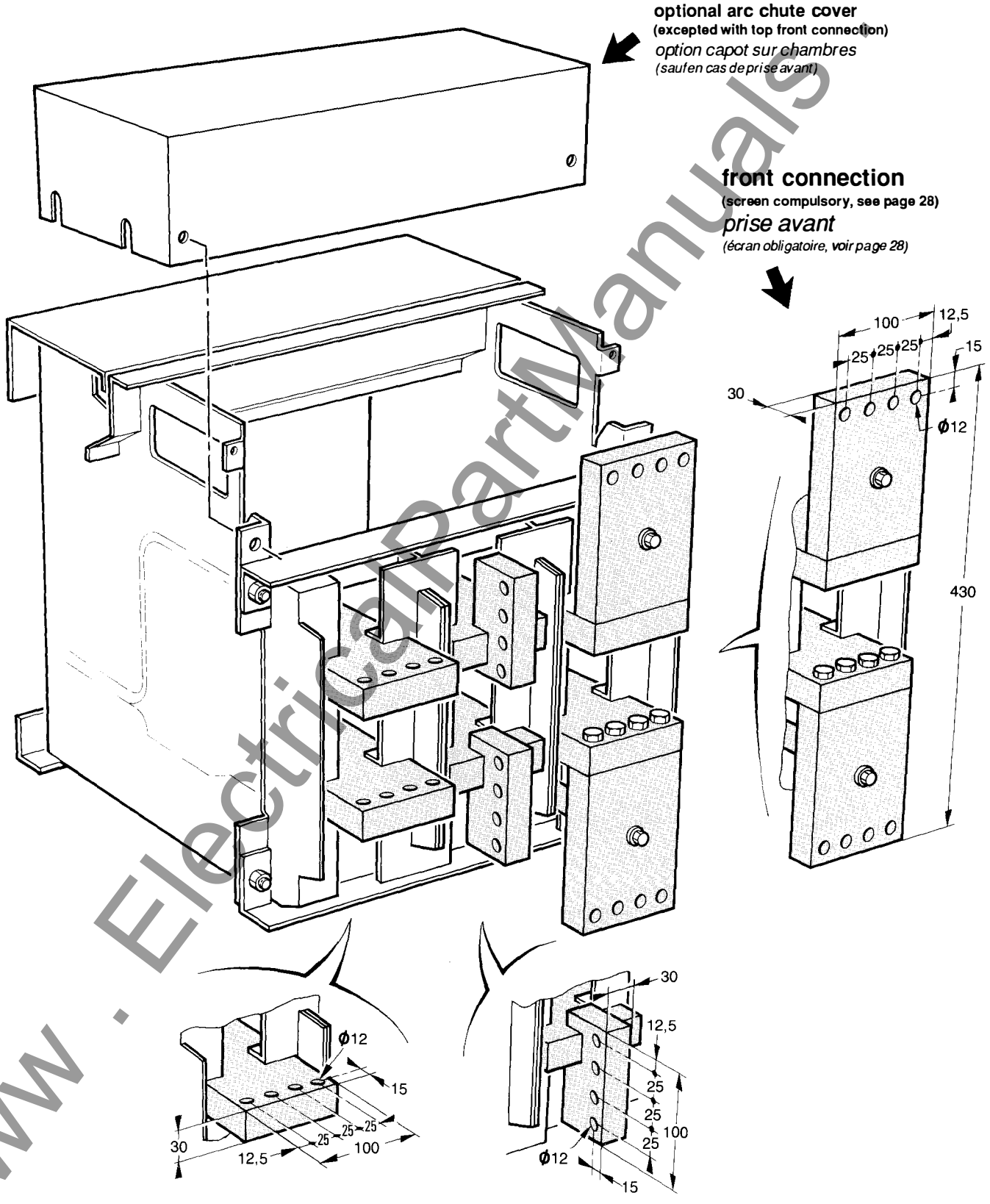


vertical terminals
plages verticales



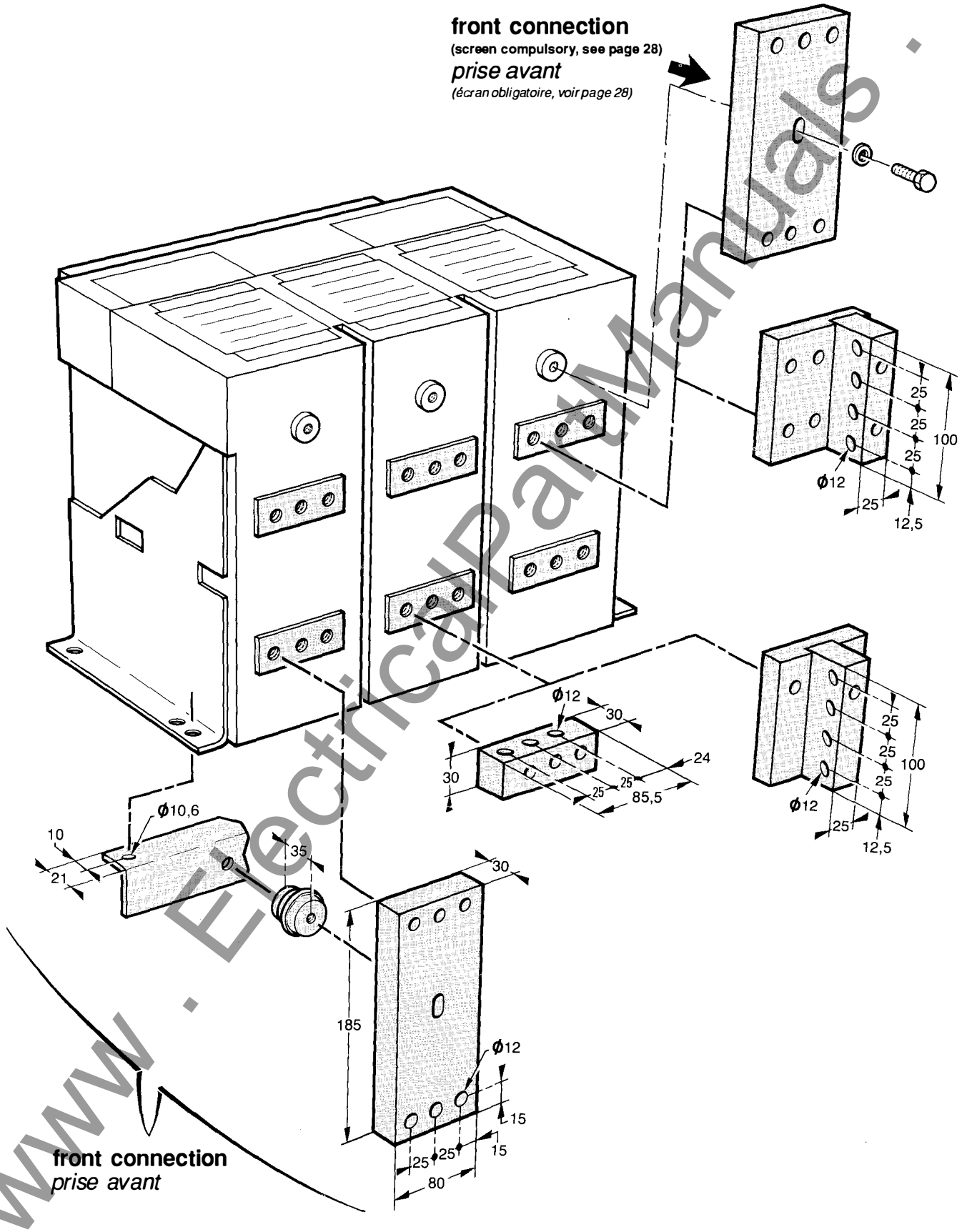
connection
raccordement
Masterpact
M20L-M25L-M32H

drawout pattern
horizontal or vertical terminals
and front connection
débrochable
plages horizontales ou verticales
et prise avant



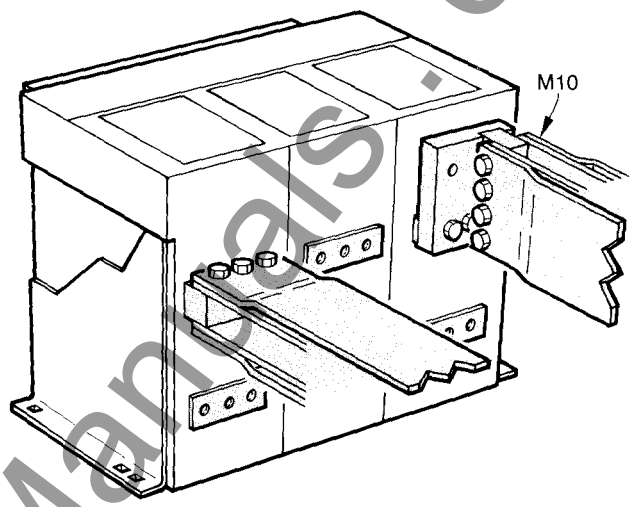
connection
raccordement
Masterpact
M20L-M25L-M32H

fixed pattern
horizontal or vertical terminals
and front connection
fixe
plages horizontales ou verticales
et prise avant

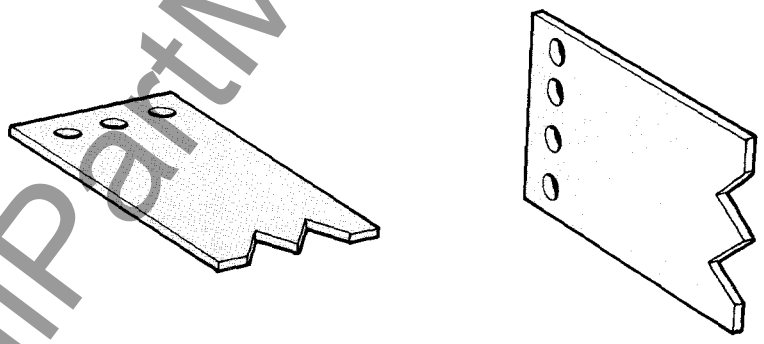


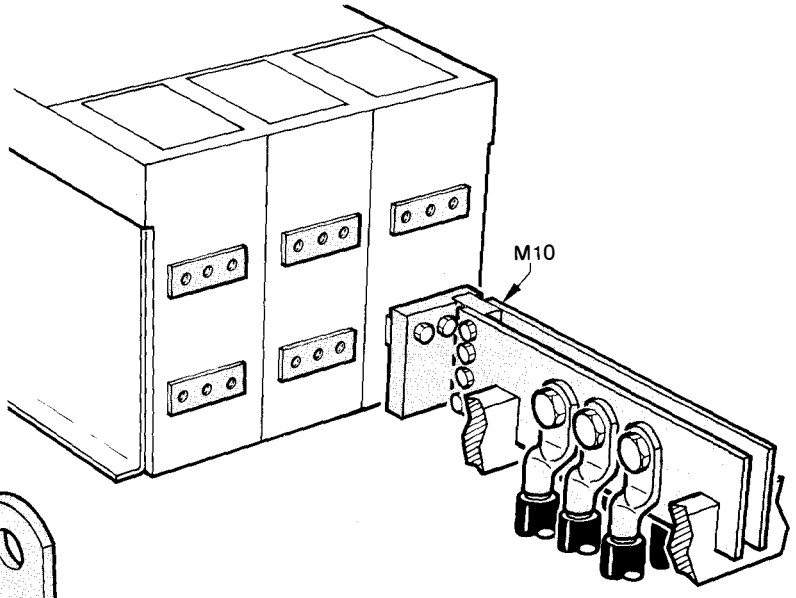
connection
raccordement
Masterpact
M20L-M25L-M32H

fixed or drawout pattern
horizontal connection
fixe ou débrochable
raccordement horizontal

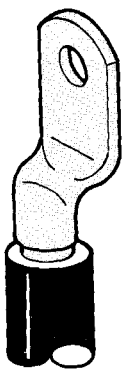


with or without vertical terminal
avec ou sans plage complémentaire





with busbar extension + supports
avec queue de barre + supports

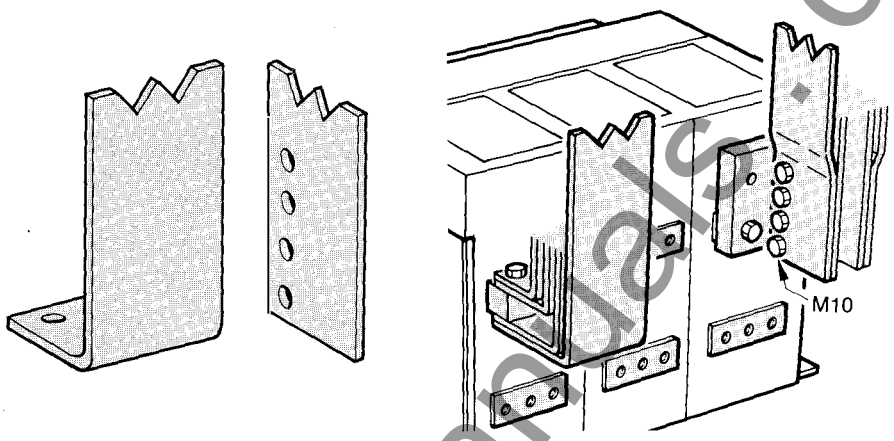


connection
raccordement
Masterpact
M20L-M25L-M32H

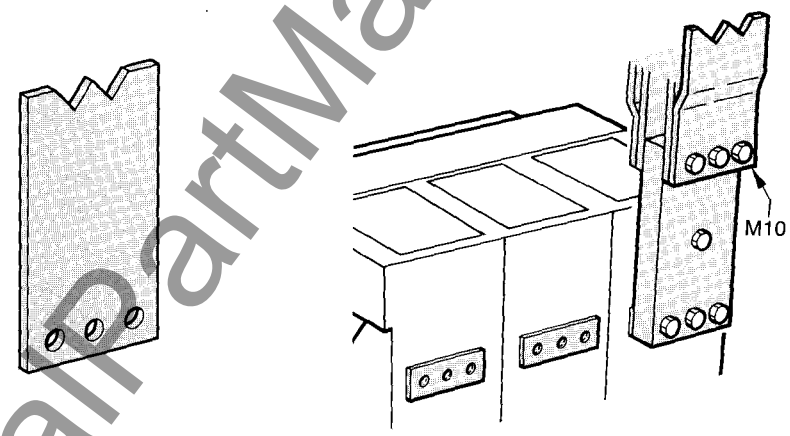
fixed or drawout pattern
vertical connection
fixe ou débrochable
raccordement vertical

fixed pattern
fixe

with or without vertical terminal (1)
avec ou sans plage complémentaire (1)

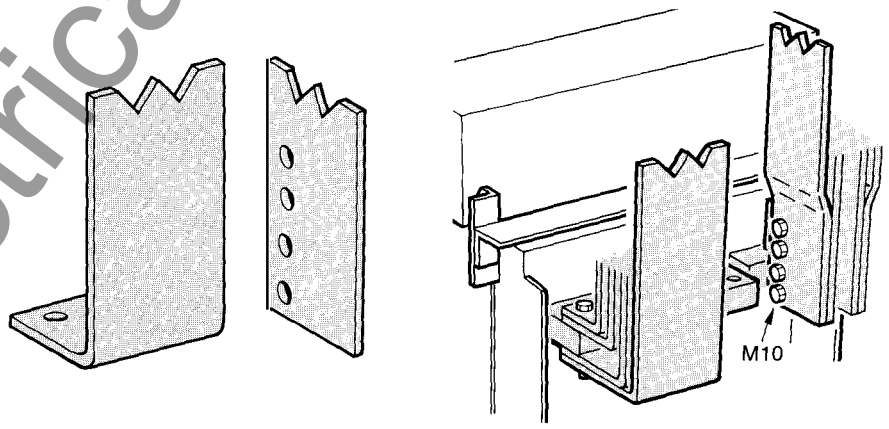


with front connection (2)
avec prise avant (2)

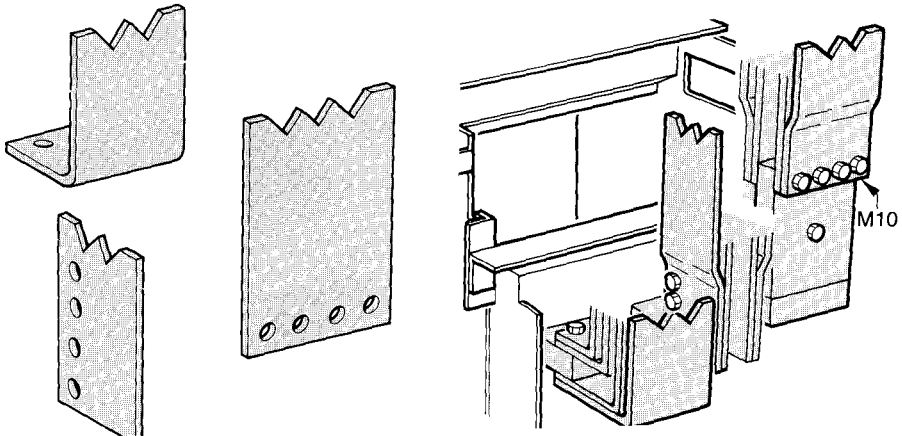


drawout pattern
débrochable

with arc chute cover
with or without vertical terminal (1)
avec capot sur chambres
avec ou sans plage complémentaire (1)



without arc chute cover
with or without vertical terminal (1)
+ front connection (2)
sans capot sur chambres
avec ou sans plage complémentaire (1)
+ prise avant (2)



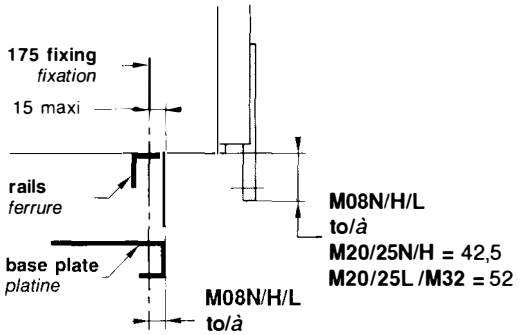
(1): screen necessary (see safety perimeters)
écran nécessaire (cf. : périmètre de sécurité)
(2): front connection screen compulsory
écran prise avant obligatoire

installation and connection
installation et raccordement
Masterpact
M08 to/*à* M32

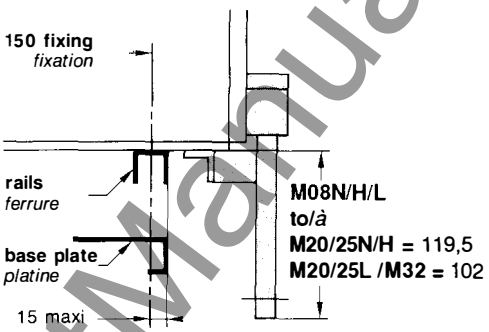
instructions and advises
instructions et conseils

installation constraints for breaker equipped with bottom front connection
contraintes d'installation appareils équipés de plages inférieures prise avant

drawout breaker
version débrochable

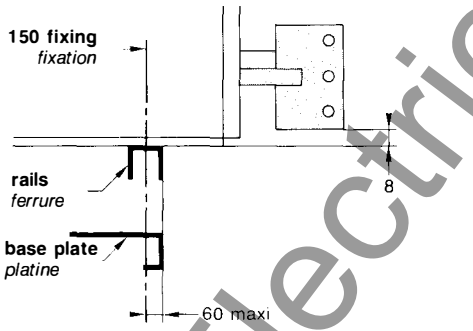


fixed breaker
version fixe

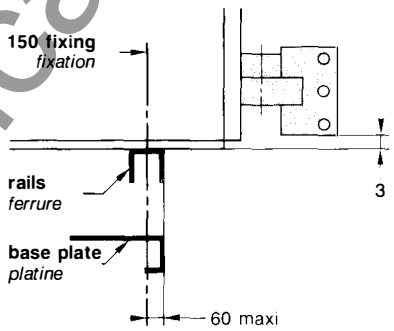


installation constraints for fixed breaker equipped with bottom rear vertical connection
contraintes d'installation appareil version fixe équipés de plages inférieures sur chant

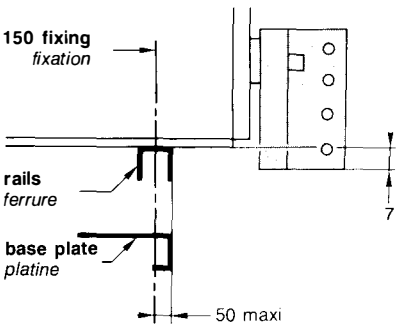
vertical terminal under horizontal connection
plage complémentaire sous connection à plat
M08H/L-M10H/L-M12H/L-M16N/H/L



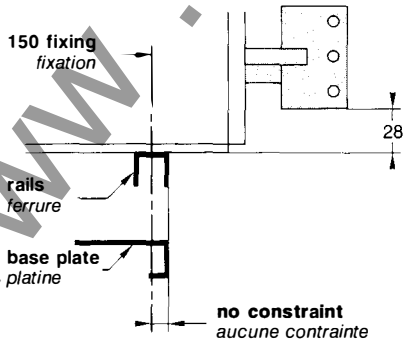
M20N/H-M25N/H



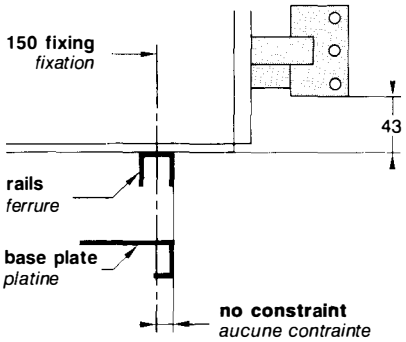
without complementary terminal
sans plages complémentaires
M32H-M20L-M25L



vertical terminal above horizontal connection
plage complémentaire sur connection à plat
M08H/L-M10H/L-M12H/L-M16N/H/L



M20N/H-M25N/H

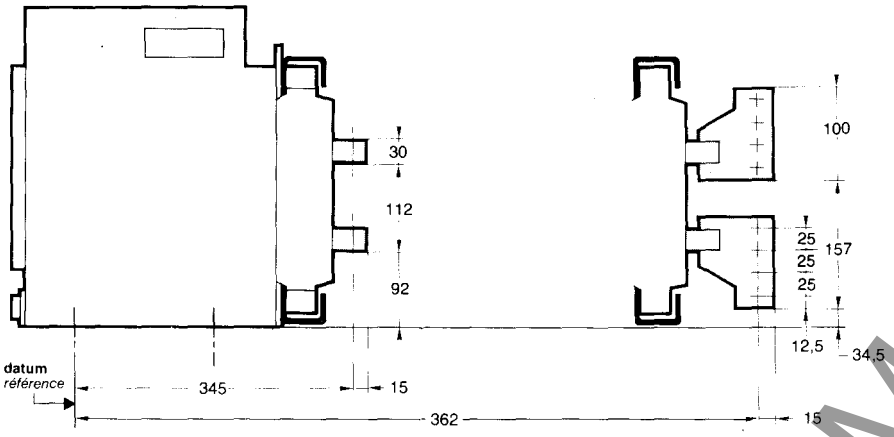


connection
raccordement
Masterpact
M40

drawout pattern
débrochable

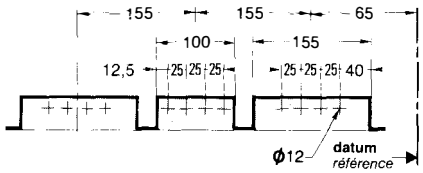
3 poles
3 pôles

horizontal terminals
plages horizontales

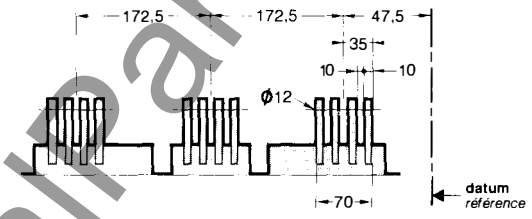


vertical terminals
plages verticales

horizontal terminals
plages horizontales

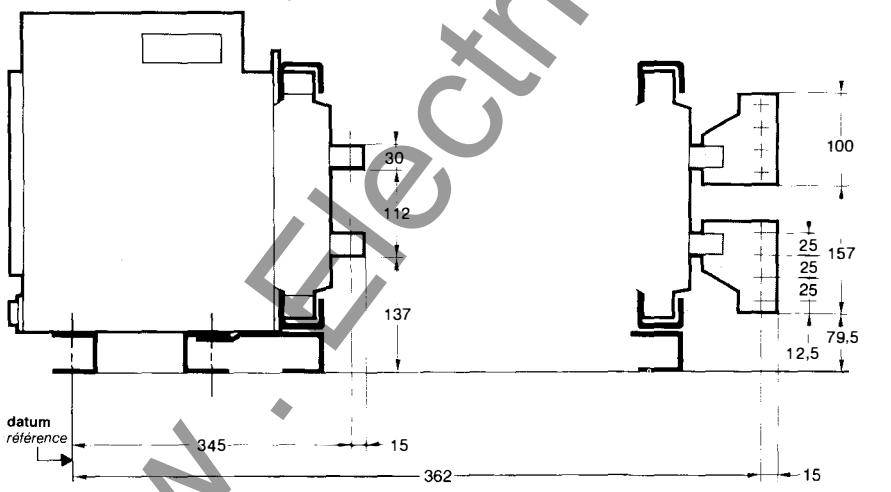


vertical terminals
plages verticales



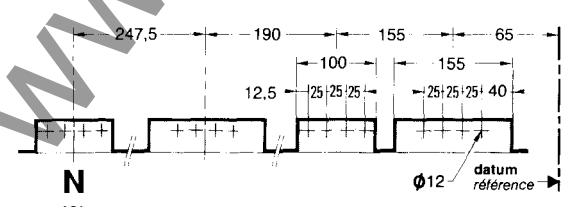
4 poles
4 pôles

horizontal terminals
plages horizontales

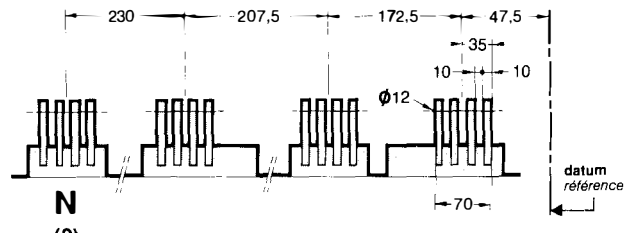


vertical terminals
plages verticales

horizontal terminals
plages horizontales

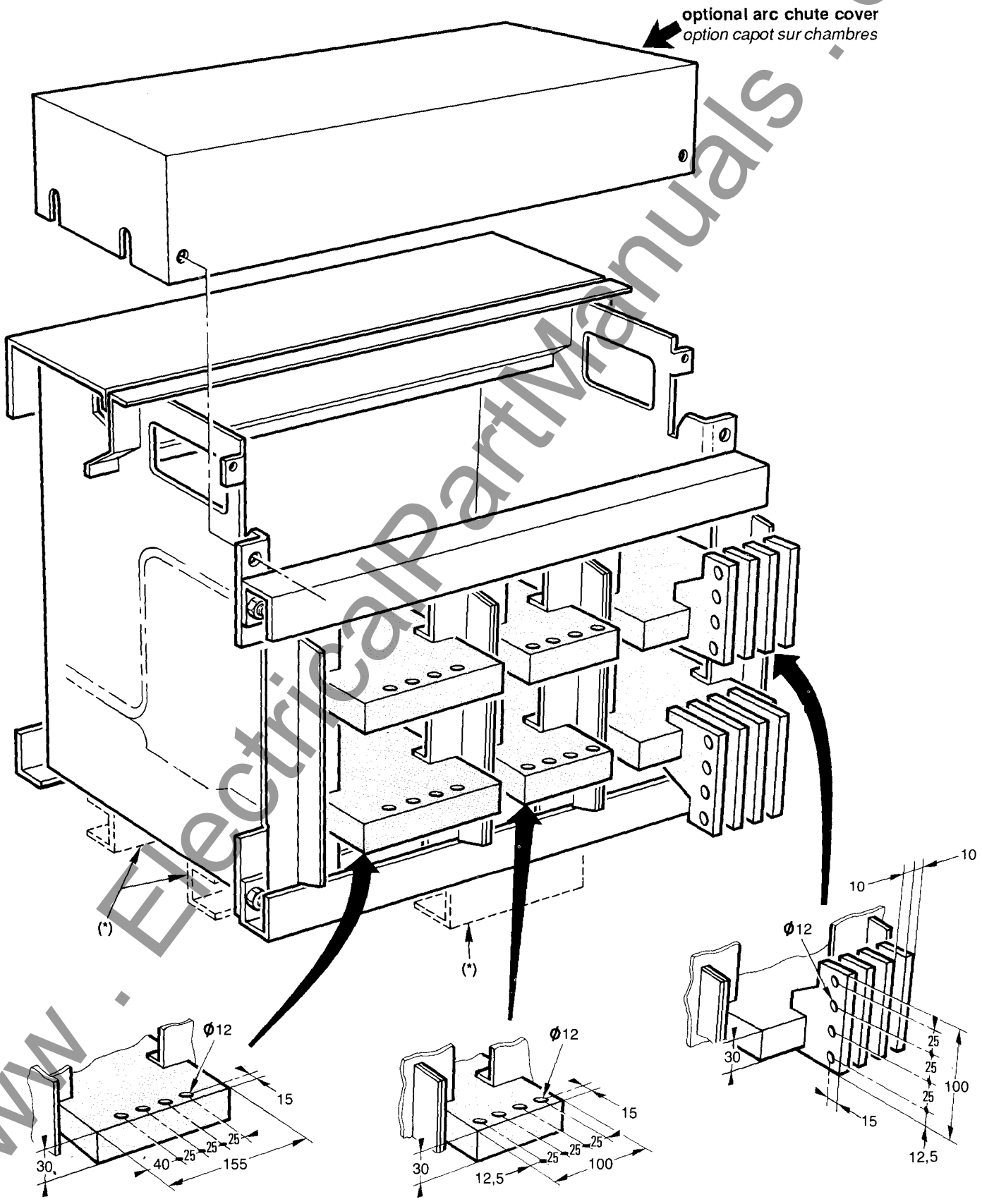


vertical terminals
plages verticales



connection
raccordement
Masterpact
M40

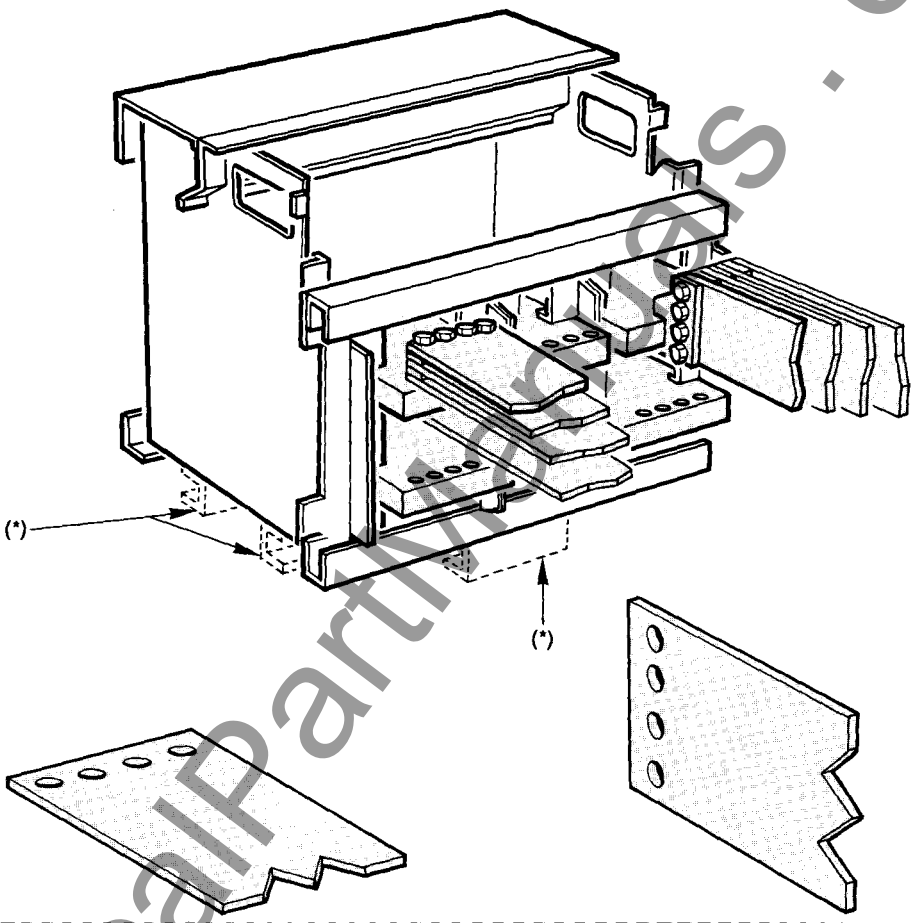
drawout pattern
horizontal or vertical terminals
débrochable
plages horizontales ou verticales



connection
raccordement
Masterpact
M40

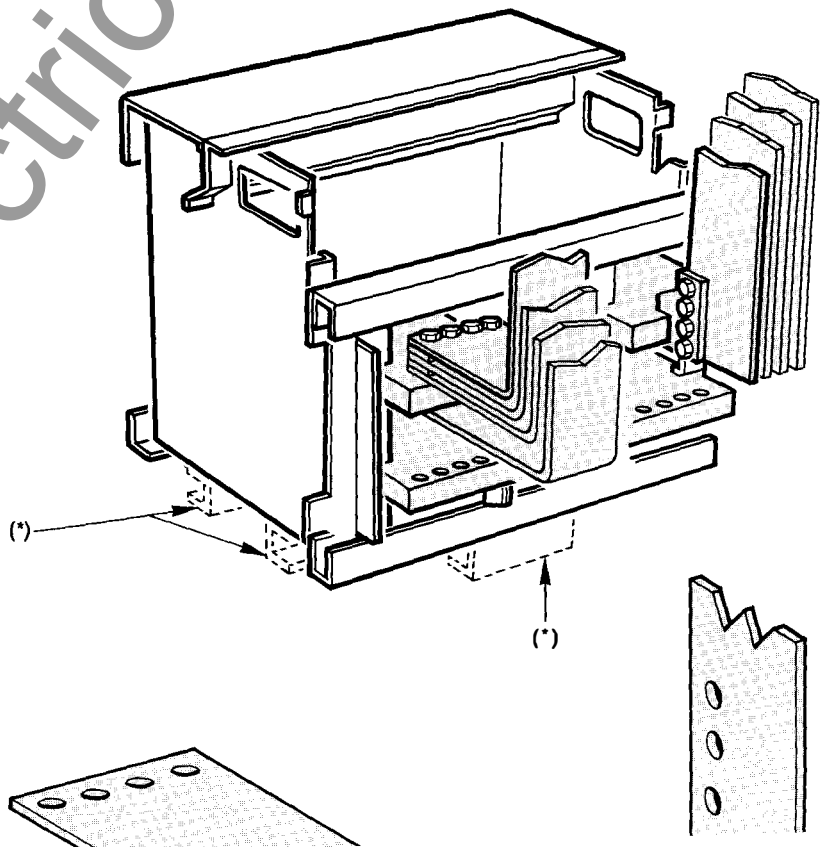
drawout pattern
horizontal or vertical connection
débrochable
raccordement horizontal ou vertical

horizontal connection
raccordement horizontal



(*) M40(4p)

vertical connection
raccordement vertical

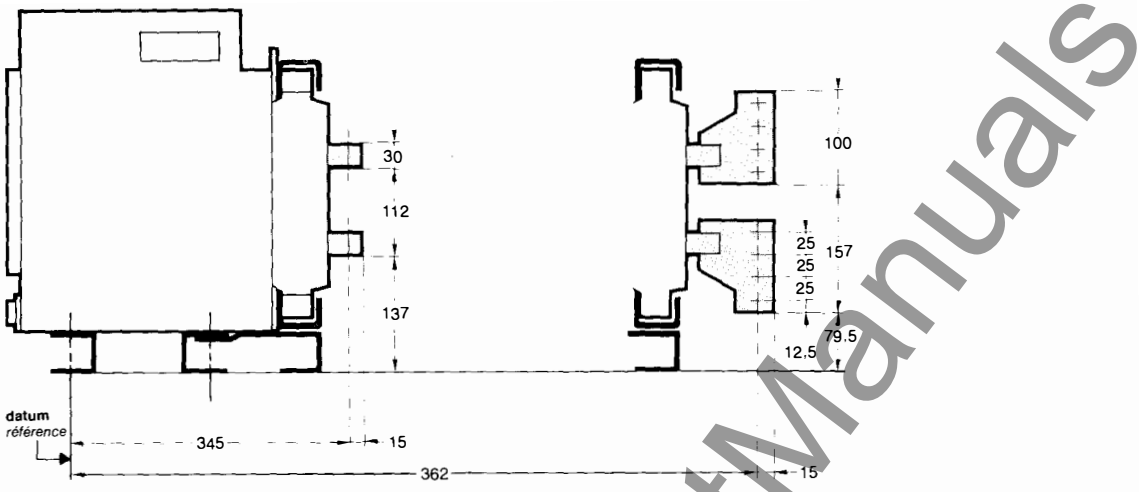


connection
raccordement
Masterpact
M50

drawout pattern
débrochable

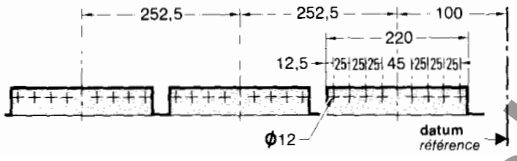
3 poles
3 pôles

horizontal terminals
plages horizontales

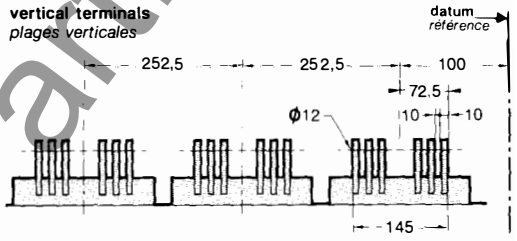


vertical terminals
plages verticales

horizontal terminals
plages horizontales

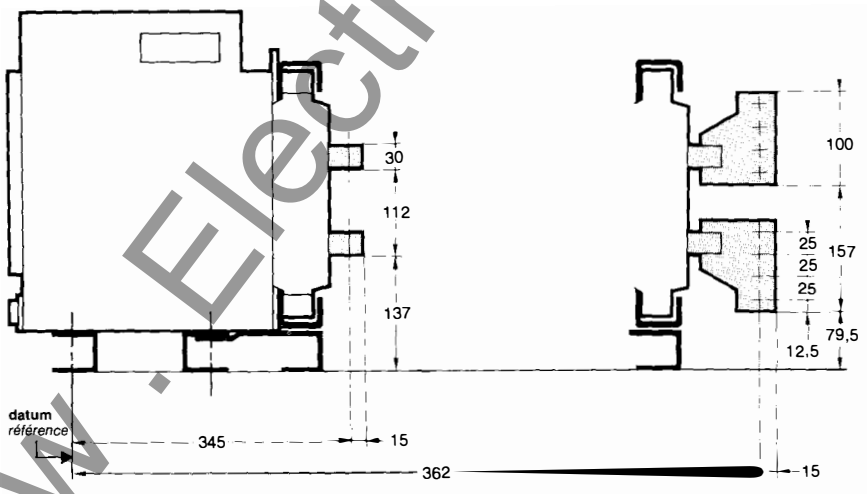


vertical terminals
plages verticales



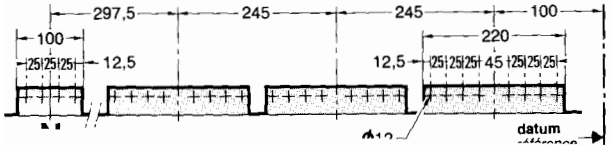
4 poles
4 pôles

horizontal terminals
plages horizontales

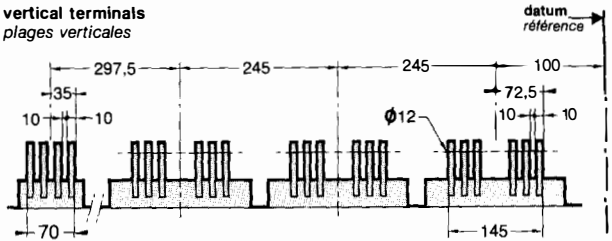


vertical terminals
plages verticales

horizontal terminals
plages horizontales



vertical terminals
plages verticales

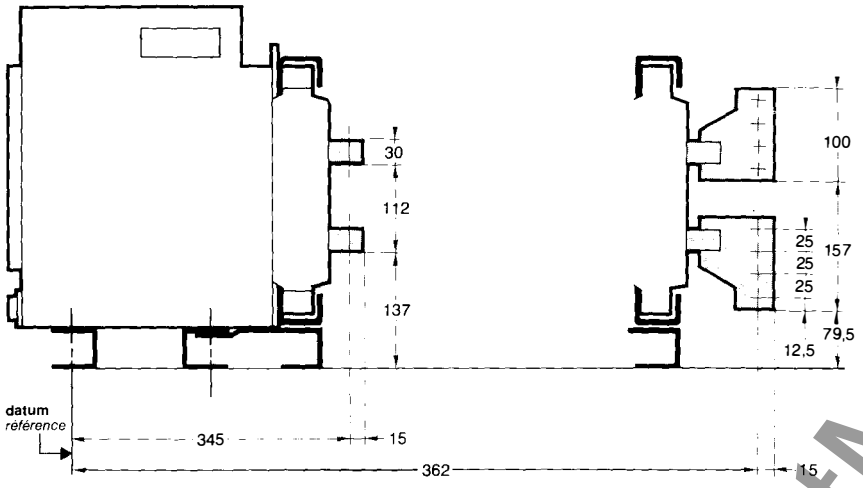


connection
raccordement
Masterpact
M63

drawout pattern
débrochable

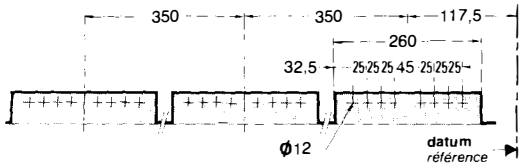
3 poles
3 pôles

horizontal terminals
plages horizontales

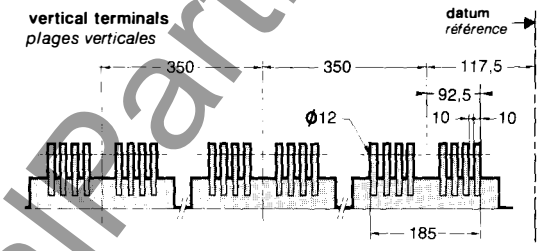


vertical terminals
plages verticales

horizontal terminals
plages horizontales

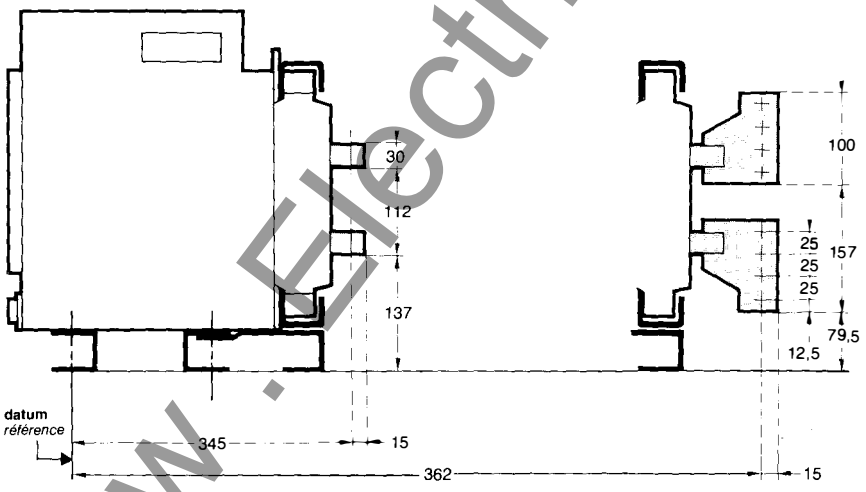


vertical terminals
plages verticales



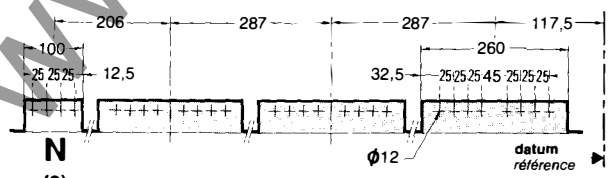
4 poles
4 pôles

horizontal terminals
plages horizontales

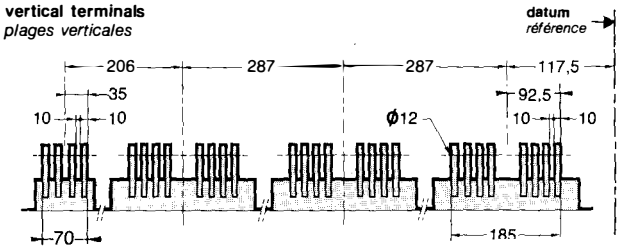


vertical terminals
plages verticales

horizontal terminals
plages horizontales

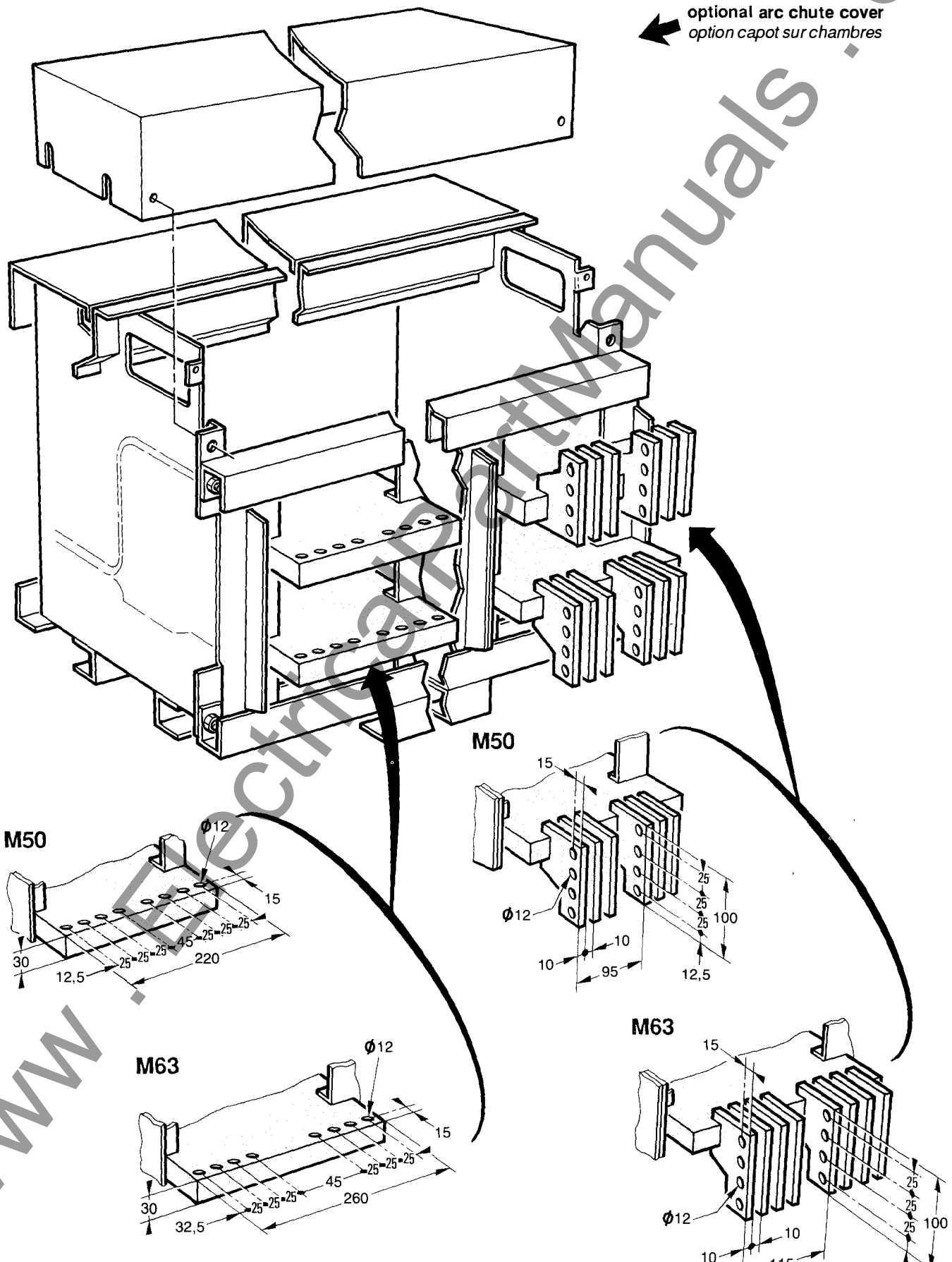


vertical terminals
plages verticales



connection
raccordement
Masterpact
M50/M63

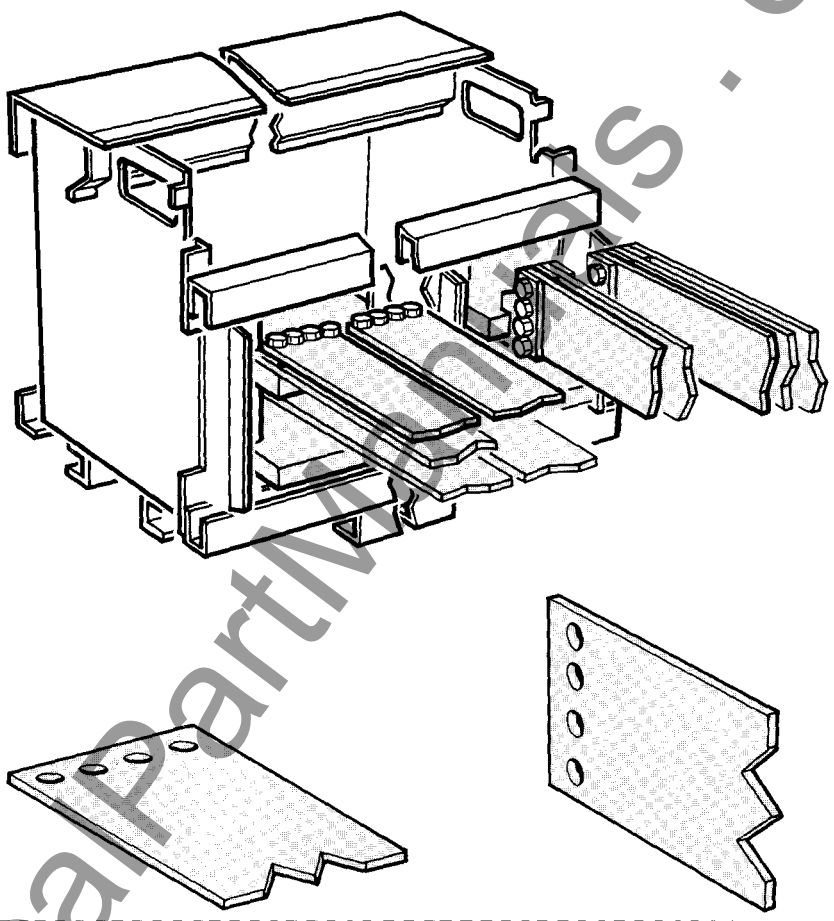
drawout pattern
horizontal or vertical terminals
débrochable
plages horizontales ou verticales



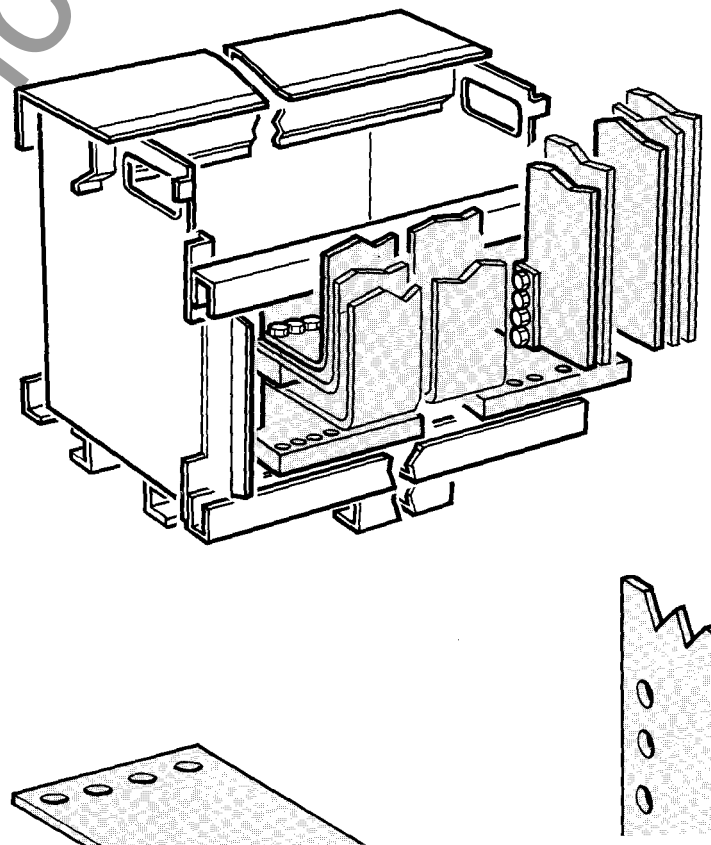
connection
raccordement
Masterpact
M50/M63

drawout pattern
horizontal or vertical connection
débrochable
raccordement horizontal ou vertical

horizontal connection
raccordement horizontal



vertical connection
raccordement vertical



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