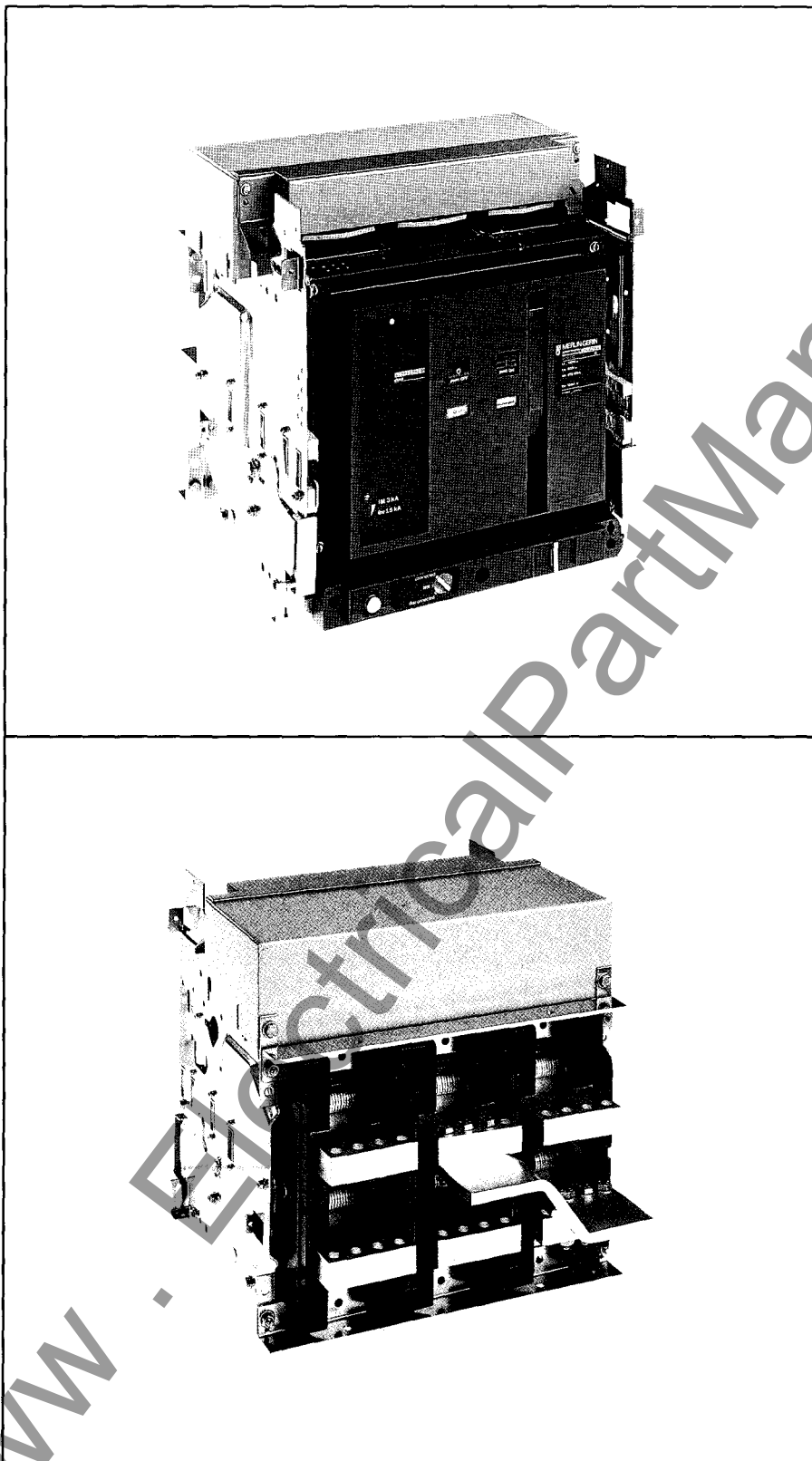




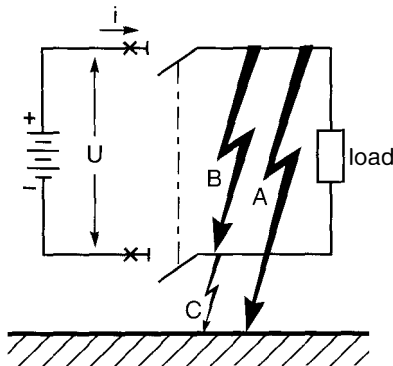
content

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selection	3
electrical characteristics	4
outline drawings	6
installation	7
connection arrangements	8 and 9
general wiring diagram	10

DC distribution networks

3 distribution systems are available for DC applications.
The selection of the D.C. rated voltage and the distribution system allows the determination of the number of poles involved in interrupting the fault current.

distribution system n°1 : isolated network



The source of supply is isolated from the earth.

if fault B

Isc maximum
The 2 polarities of the breaker are involved in clearing the fault.

if fault A or C

no consequence.

if simultaneous fault A and C

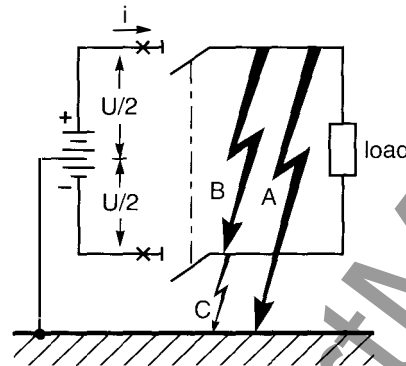
Isc < Isc max.
(due to earth loop impedance).
The 2 polarities of the breaker are involved in clearing the fault.

most unfavourable fault :

fault B

Isc maximum
To distribute the poles on each polarity (positive and negative).

distribution system n°2 : earthed middle point



The middle point of the source of supply is earthed.

if fault B

Isc maximum (under U)
The 2 polarities of the breaker are involved in clearing the fault.

if fault A or C

Isc < Isc maximum under U/2
The positive or negative polarity of the breaker is involved in clearing the fault.

if simultaneous fault A and C

Isc < Isc max.
(due to earth loop impedance).
The 2 polarities of the breaker are involved in clearing the fault.

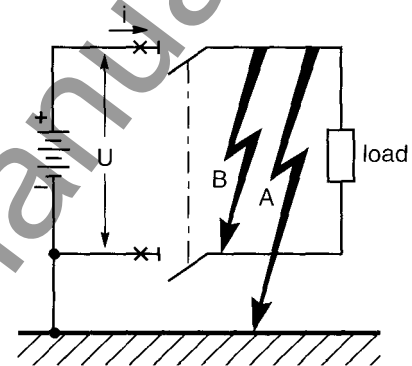
most unfavourable fault :

fault A or C

Each polarity (positive or negative) can be concerned by the fault under U/2

distribution system n°3 : earthed negative polarity

1st alternative :



The negative polarity of the source of supply is earthed.

if fault A

Isc maximum
The positive polarity of the breaker is involved in clearing the fault.

if fault B

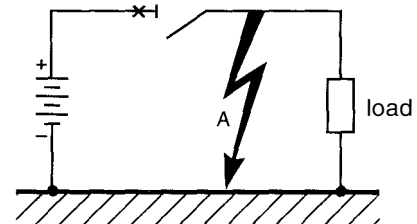
Isc maximum
The 2 polarities of the breaker are involved in clearing the fault.

most unfavourable fault :

fault A

Isc maximum on a single polarity.
All the poles must be connected in series on the positive polarity.
In this case, the extra pole provided on the negative polarity has only an isolating function.

2nd alternative :



The source of supply and the receptors are earthed.

One type of fault (A) :
all the poles must be associated in series on the positive polarity.

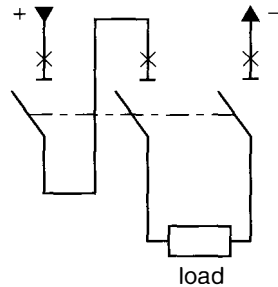
frame selection

series or parallel connections

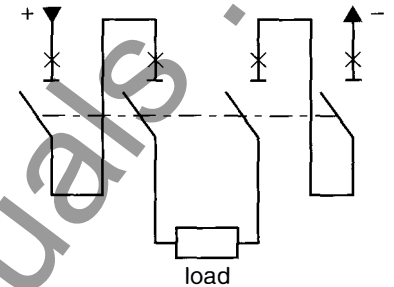
3 types of series connections and 1 type of parallel connection are available on Masterpact D.C. range. The selection of this variant according to the table here after will have to be mentioned on the order form.

The links used for the series connection are supplied as loose parts with the breaker.

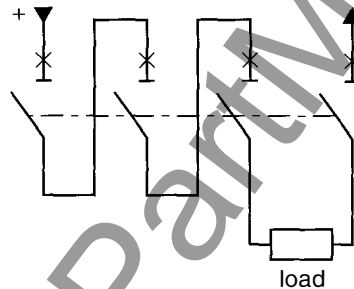
type D :
3 poles breaker



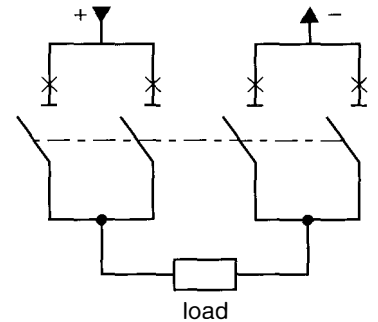
type E :
4 poles breaker



type F :
4 poles breaker



type G :
2 poles breaker



selection table

breaker frame	M10-20-40DC			M60-80DC
rated voltage (V)	250/500	750	1000	250
network n°1 : isolated	D	E	E	G
network n°2 : middle point	D	E	E	G
network n°3 : earthed negative polarity				
■ alternative n°1 : source of supply	D	F	—	G
■ alternative n°2 : source of supply and receptors	D	F	—	G

electrical characteristics

2 versions are available

- unprotected switch version with dummy unit ST 008
- breaker version with instantaneous protection against short circuit by an adjustable magnetic trip unit (type DINA).

note : possibility to use the AC range (M08 to M63) in a **switch version only under a voltage not exceeding 125V DC.**

This application required a 3 poles unprotected breaker type HI with :

- 1 pole on the positive polarity
- 1 pole on the negative polarity

selection of DC breaker

The selection of a DC breaker depends upon the following parameters :

- the rated current
- the rated voltage for the definition of the poles association
- the short circuit level for the selection of the breaking capacity level.

electrical characteristics		M10DC	
rated voltage (V DC)		250/500	750/1000
number of poles		3 poles	4 poles
insulation level (V DC)		1000	1000
rated current (A)	at 40°C	1000	1000
	at 45°C	1000	1000
	at 50°C	1000	1000
	at 55°C	1000	1000
	at 60°C	1000	1000
	at 65°C	1000	1000
type of poles association		D	E or F
breaking capacity (KA)	IEC 947/2-Ics	100	50
	(for a time constant L/R ≤ 15ms) IEC 947/2-Icu	100	50
short time withstand capacity 1s		100	50
operating times	total breaking time (max.)	20 to 35ms	
	closing time	60ms	
switch version	dummy unit ST 008	■	■
making capacity (KA peak)		100	50
short time withstand capacity 1s		100	50
endurance (C/O cycle)	mechanical without maintenance	10000	10000
	with maintenance	15000	15000
	electrical without maintenance	10000	1600
	(at the maximum voltage)		
maximum weight (kg) (including packing)	drawout version	125	160
	breaker alone	65	80
	cradle alone	80	100

description of the trip unit

The trip unit type DINA is an instantaneous magnetic release with adjustable setting.

It provides only a protection against short circuit (no overload protection). 7 versions of magnetic trip unit with different level of adjustments are available (see selection table).

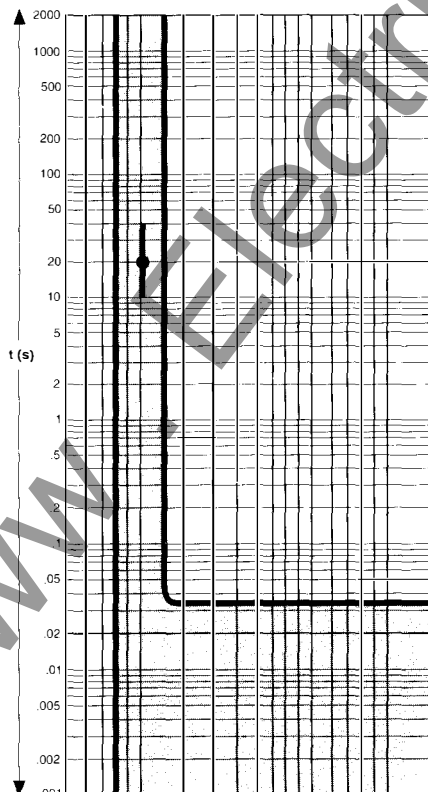
As for the AC range, this trip unit provides 4 auxiliary contacts (2NO + 2NC) and one alarm contact (SDE).

magnetic releases characteristics

Im adjustable (accuracy ± 20%)	M10-20-40DC	M60-80DC
from 1500 to 3000A	■	
from 3 to 6kA	■	
from 6 to 12kA	■	
from 10 to 20kA	■	
from 9 to 18kA		■
from 12 to 24kA		■
from 20 to 40kA		■

M20DC		M40DC		M60DC	M80DC
250/500	750/1000	250/500	750/1000	250	250
3 poles	4 poles	3 poles	4 poles	2 poles	2 poles
1000	1000	1000	1000	1000	1000
2000	2000	4000	4000	6000	8000
2000	2000	4000	3860	6000	8000
2000	2000	3900	3750	6000	8000
2000	2000	3780	3630	6000	8000
2000	2000	3660	3520	6000	8000
2000	2000	3530	3400	6000	8000
D	E or F	D	E or F	G	G
100	50	100	50	100	100
100	50	100	50	100	100
100	50	100	50	100	100

■	■	■	■	■	■
100	50	100	50	100	100
100	50	100	50	100	100
10000	10000	5000	5000	5000	5000
15000	15000	10000	10000	10000	10000
8500	1600	4000	1600	1600	1600
125	160	135	170	150	150
65	80	65	80	80	80
80	100	90	110	90	90



installation

The Masterpact DC range is available only **in drawout version** equipped in standard with the arc chute cover (CC) and the safety shutters (VO).

accessories

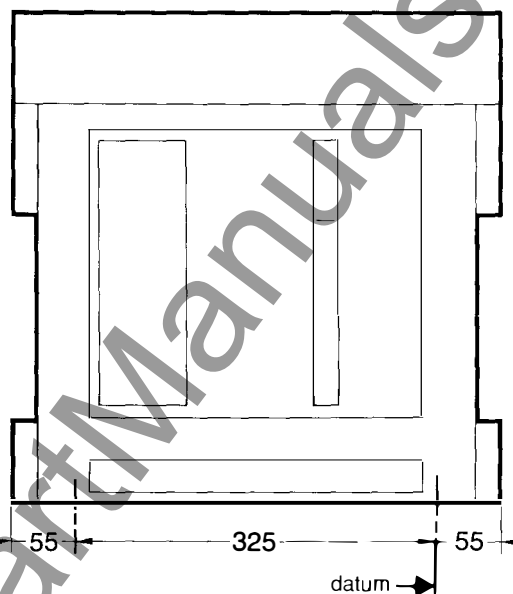
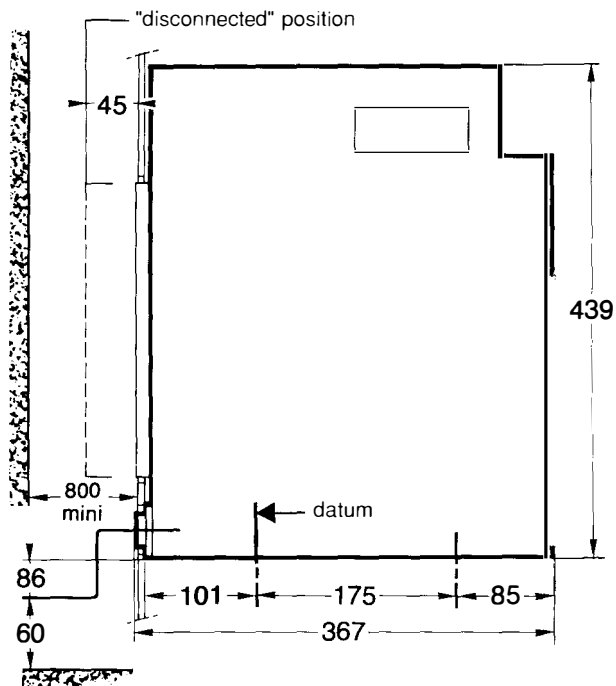
All the accessories available on the AC range can be used on Masterpact DC except position carriage switch (CE, CT and CD) and interphase barrier (EIP).
Auxiliaries connection is made by one or two manual disconnectable plugs (accessible from the front).

vibration withstand

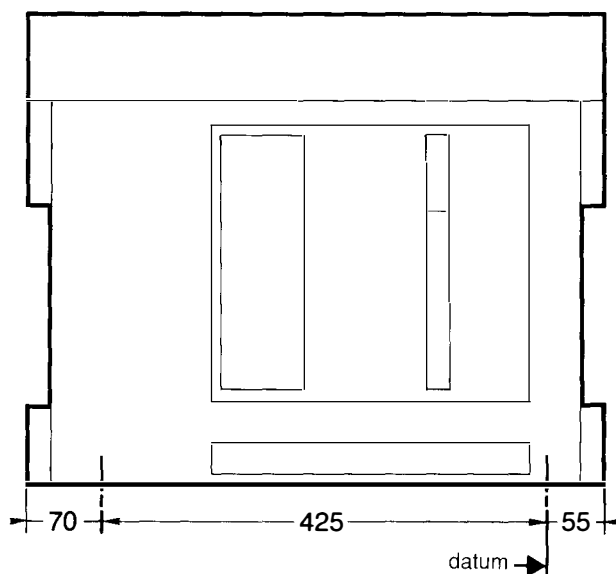
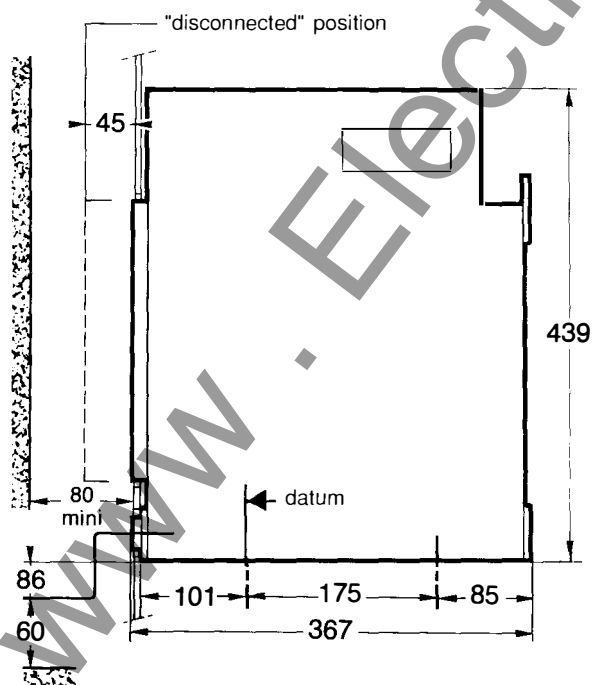
The breaker of the DC range have been tested to vibrations in compliance with the LLOYDs recommendations. These tests warrant the reliability of our devices for the marine applications.

outline drawings

Masterpact M10/20/40DC - type D



Masterpact M10/20/40DC - type E or F M60/80DC - type G

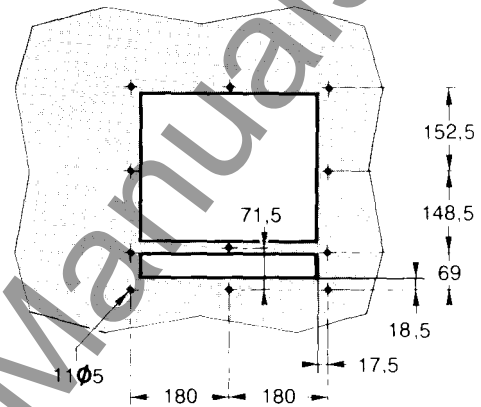
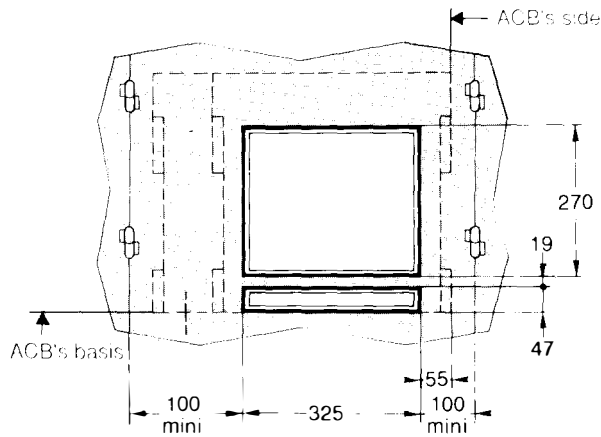


installation

Masterpact M10DC to M80DC

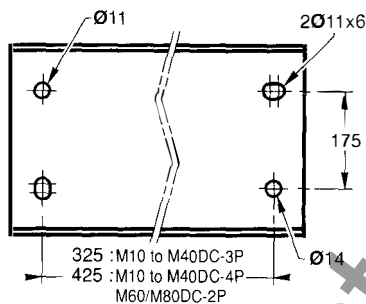
door cutting

drilling for fixation of the door frame (CDP)

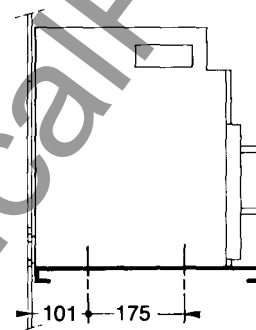


installation drawings

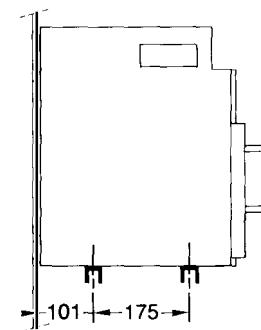
fixing plate details



fixing on base plate (a)

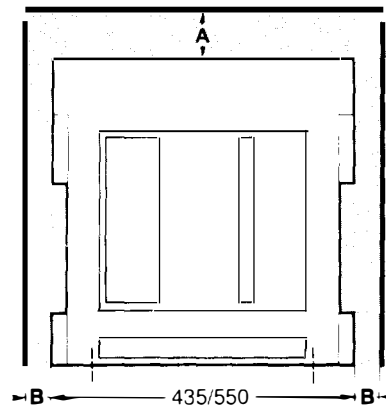
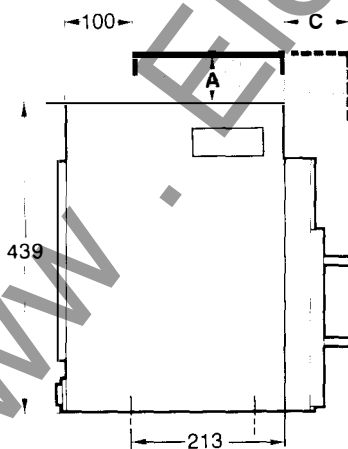


fixing on rails (a)



a) tolerance on support flatness : 2mm

safety perimeters

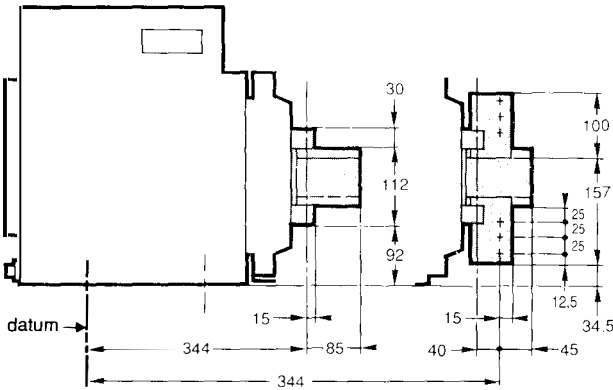


connection arrangements

table of selection for connections

breaker frame type	M10DC D, E or F	M20DC D, E or F	M40DC D, E or F	M60DC G	M80DC G
connection facilities					
vertical connections	■	■	■	■	■
horizontal connections	■	■			
advised copper cross section					
for vertical connections	1b.100x5	2b.100x5	3b.100x10	5b.100x10	6b.100x10
for horizontal connections	2b.100x5	3b.100x5	—	—	—

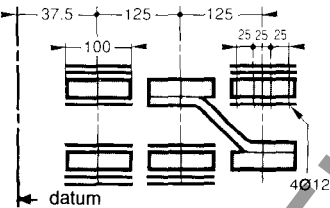
M10/M20DC



type D (3 poles)

rear view

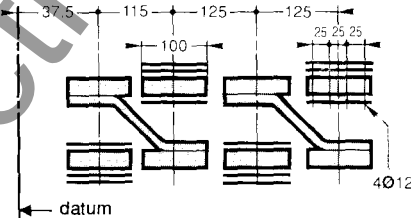
horizontal connections



type E (4 poles)

rear view

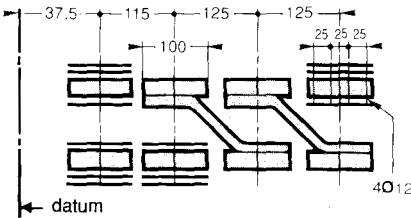
horizontal connections



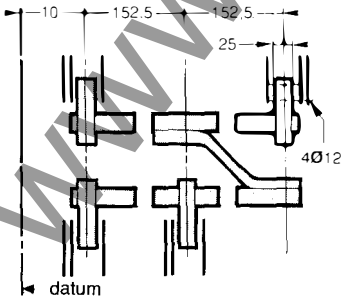
type F (4 poles)

rear view

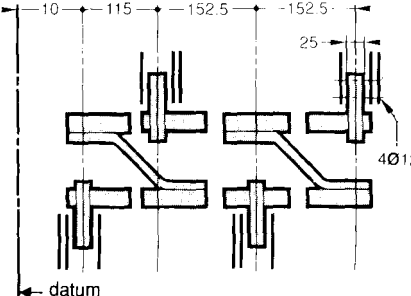
horizontal connections



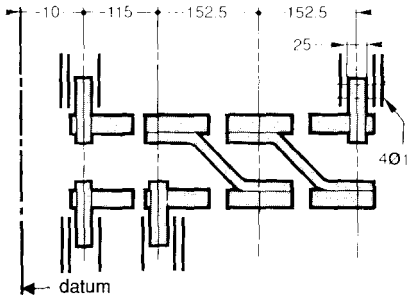
vertical connections



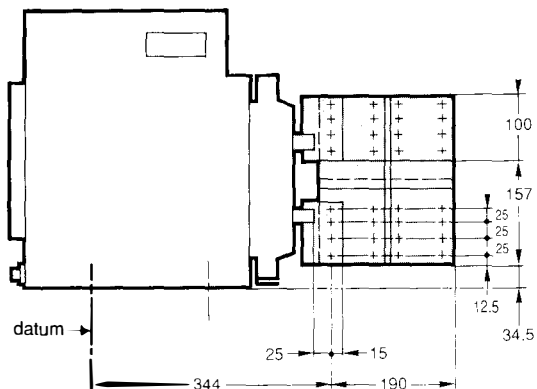
vertical connections



vertical connections



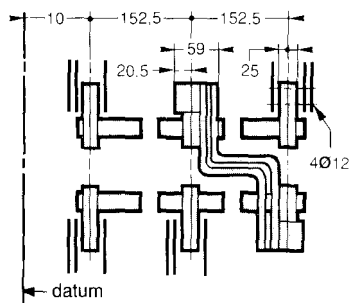
M40DC



type D (3 poles)

rear view

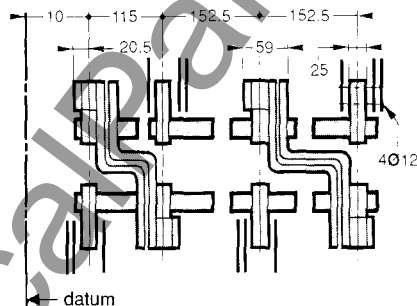
vertical connections



type E (4 poles)

rear view

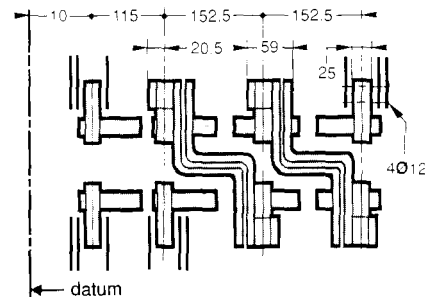
vertical connections



type F (4 poles)

rear view

vertical connections

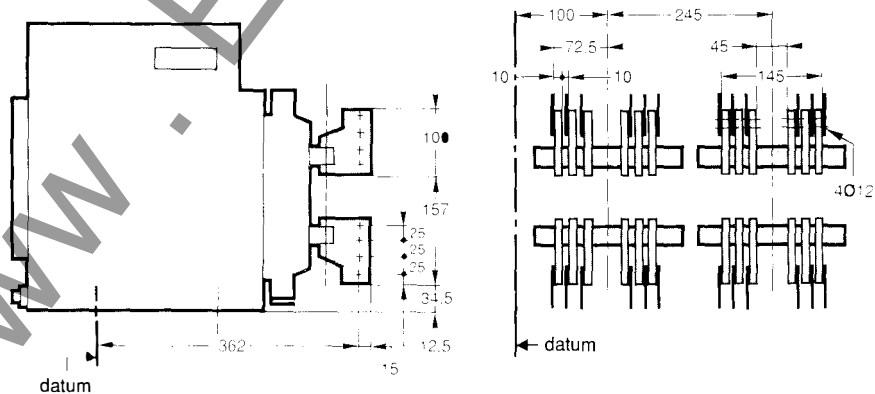


M60/M80DC

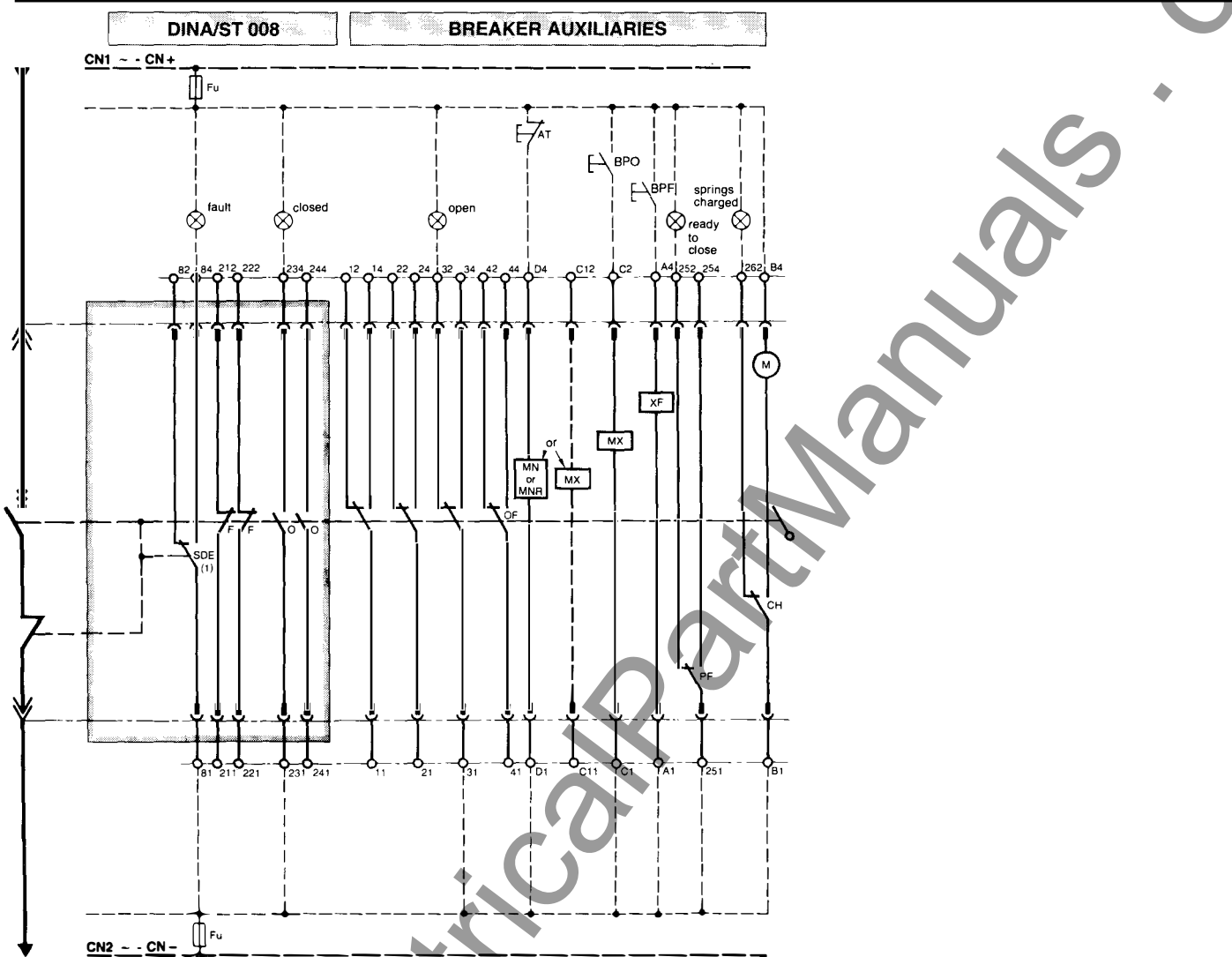
type G (2 poles)

rear view

vertical connections

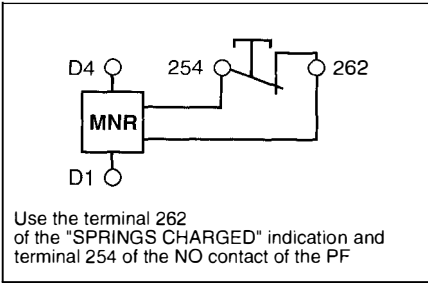


general wiring diagram



- Fu** : fuse 2A
- AT** : EMERGENCY OFF
- BPO** : open pushbutton
- BPF** : close pushbutton
- M** : spring charging motor (180W)
- XF** : closing release (15W)
- MX** : shunt release (15W)
- MN** : undervoltage release (15W)
- MNR** : time delayed undervoltage release (15W) (2)
- OF** : auxiliary changeover contacts
- O** : 2 auxiliary NO contacts
- F** : 2 auxiliary NC contacts
- SDE** : fault trip indication contact
- CH** : spring charged contact
- PF** : ready to close contact (closing possible if breaker is open, not locked and operating mechanism charged)

MNR wiring for instantaneous tripping



c

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