Masterpact
LV air circuit breaker

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Masterpact LV air circuit breaker

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 C6372,
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)

reduced dimensions

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

Breaking capacity (kA rms, IEC P2 380/415 V)
current rating (A) 800 to 1600 2000/2500 3200 4000 5000 6300

<table>
<thead>
<tr>
<th>type</th>
<th>800</th>
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<th>2000/2500</th>
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<th>4000</th>
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</table>
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).

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.
Masterpact LV air circuit breaker

Description:

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 with cubicle door closed)
11. Neutral
12. Stored energy mechanism 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 6300 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.
a new drawout breaker design

Increased safety in “test” and “disconnected” positions

All types of main circuit connections available

Front connection of auxiliary circuits
- wired via automatic disconnecting contacts
- 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

<table>
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<th>M08</th>
<th>M10</th>
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## Other Characteristics

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<td>3 P</td>
<td>437</td>
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<td>(kg)</td>
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<td>3 P</td>
<td>65</td>
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</tr>
<tr>
<td>Fixed</td>
<td>3 P</td>
<td>43</td>
<td>46</td>
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## Sensor Selection

- The following table gives the entire Masterpact range.

### Sensor Selection

<p>| LR current (A) | 80 | 100 | 125 | 160 | 200 | 240 | 250 | 280 | 320 | 400 | 480 | 500 | 640 | 800 | 1,000 | 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 | 280 | 320 | 400 | 480 | 500 | 640 | 800 | 1,000 | 1,250 | 1,600 | 2,000 | 2,500 | 3,000 | 3,200 | 4,000 | 5,000 | 6,000 | 6,300 |</p>
<table>
<thead>
<tr>
<th>M16</th>
<th>M20</th>
<th>M25</th>
<th>M32</th>
<th>M40</th>
<th>M50</th>
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</table>

25 to 30 ms with no intentional delay - 9 ms for version L1

60 ms (40 ms: consult us)

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<th>M20</th>
<th>M25</th>
<th>M32</th>
<th>M40</th>
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<td>3200</td>
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<td>4000</td>
<td>4000</td>
<td>4000</td>
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<td>4000</td>
</tr>
</tbody>
</table>

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

Control units: Outline drawings and connections
Time / current

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www.ElectricalPartManuals.com
Masterpact
LV air circuit breaker

control units

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<td>ST608</td>
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<tr>
<td>Control Units</td>
<td>Basic Functions</td>
</tr>
<tr>
<td>---------------</td>
<td>-----------------</td>
</tr>
</tbody>
</table>
| ST108, ST128, ST208 | **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. | **Measurement**  
• ammeter.  
**Testing**  
• simplified test kit (mini-battery unit),  
• calibration test kit. |
| ST308/318, ST408/418 | **Selective protection against:**  
• overloads with fixed or adjustable time delay,  
• short circuits with or without time discrimination. | **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 | **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. | **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:

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
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

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 access to complementary functions
**control units**

**ST108/ST128/ST208D**

**instantaneous and standard protection**

### 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 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 ST108 and ST128

**Basics Functions**

<table>
<thead>
<tr>
<th>Function</th>
<th>ST108</th>
<th>ST128</th>
<th>ST208</th>
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<tbody>
<tr>
<td>Long Time Protection LT</td>
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<td>between 1.05 and 1.20 x Ir</td>
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**Instantaneous Protection**

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<tr>
<th>Function</th>
<th>ST108</th>
<th>ST128</th>
<th>ST208</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pick-up Im (A)</td>
<td>2 to 10</td>
<td>2 to 10</td>
<td></td>
</tr>
<tr>
<td>Inst Pick-up Inst</td>
<td></td>
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</tbody>
</table>

**Accuracy**

<table>
<thead>
<tr>
<th></th>
<th>ST108</th>
<th>ST128</th>
<th>ST208</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>±20 %</td>
<td>±15 %</td>
<td>±15 %</td>
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</table>

#### Optional Functions

**Ammeter (I)**

<table>
<thead>
<tr>
<th>Function</th>
<th>ST108</th>
<th>ST128</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Supply AC 50/60 Hz</td>
<td>110/220 V - 240/440 V²</td>
<td></td>
</tr>
<tr>
<td>Display Value of</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>±15 %²</td>
<td></td>
</tr>
</tbody>
</table>

#### Accessories

See 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). 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 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) activate 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.
<table>
<thead>
<tr>
<th>characteristics</th>
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</thead>
<tbody>
<tr>
<td>control unit</td>
</tr>
<tr>
<td><strong>basic functions</strong></td>
</tr>
<tr>
<td>long time protection LT</td>
</tr>
<tr>
<td>current setting lr (A) lr = In x...</td>
</tr>
<tr>
<td>maximum time delay (s) at 1.5 lr</td>
</tr>
<tr>
<td>maximum tripping</td>
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<tr>
<td>short time protection ST</td>
</tr>
<tr>
<td>pick-up lm (A) lm = lr x...</td>
</tr>
<tr>
<td>maximum resettable time (ms)</td>
</tr>
<tr>
<td>maximum breaking time (ms)</td>
</tr>
<tr>
<td>instantaneous protection INST</td>
</tr>
<tr>
<td>pick-up l (A) l = In x...</td>
</tr>
<tr>
<td>maximum time delay (s)</td>
</tr>
<tr>
<td>maximum resettable time (ms)</td>
</tr>
<tr>
<td>maximum breaking time (ms)</td>
</tr>
<tr>
<td>zone selective interlocking</td>
</tr>
<tr>
<td>ammeter (I)</td>
</tr>
<tr>
<td>power CA 50/60 Hz</td>
</tr>
<tr>
<td>maximum consumption (VA)</td>
</tr>
<tr>
<td>display value of I1-I2-I3-Imax</td>
</tr>
<tr>
<td>accuracy</td>
</tr>
<tr>
<td>load monitoring (R)</td>
</tr>
<tr>
<td>load limit 1 (A) lc1 = lr x...</td>
</tr>
<tr>
<td>maximum time delay, fixed (s)</td>
</tr>
<tr>
<td>remote output</td>
</tr>
<tr>
<td>load limit lc2 (A) lc2 = lr x...</td>
</tr>
<tr>
<td>maximum time delay, fixed (s)</td>
</tr>
<tr>
<td>remote output</td>
</tr>
<tr>
<td>fault indicators</td>
</tr>
<tr>
<td>front face LEDs (F)</td>
</tr>
<tr>
<td>front face LEDs and remote output (J)(S)</td>
</tr>
<tr>
<td>power</td>
</tr>
<tr>
<td>accessories</td>
</tr>
</tbody>
</table>

---

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

Sensor selection (In):
Accessories for control units:
Time/current
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,
  - 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 I2t 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.
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.

ammetter
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...
  - lc1 = maximum load setting (load shedding)
  - lc2 = 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).

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), lc1 and lc2 settings
- breaker status (open or closed)
- differentiated fault indications
- value of fault current
- pick-up overrun (real or simulated)
- thermal memory status
- “test” position
- lc1 or lc2 output states (load monitoring and control)
- self-monitoring output states
- maintenance indication.
See document no. 688191 (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.
### Characteristics

<table>
<thead>
<tr>
<th>Basic Functions</th>
<th>ST608U</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Long Time Protection (LT)</strong></td>
<td></td>
</tr>
<tr>
<td>Current setting (A)</td>
<td>0.4 to 1 (in 2% steps, 160 A minimum)</td>
</tr>
<tr>
<td>Maximum tripping (A) at 1.5 times setting</td>
<td>adjustable: 15-30-60-120-240-480</td>
</tr>
<tr>
<td>Time delay (s) accuracy</td>
<td>+0 - 20%</td>
</tr>
<tr>
<td><strong>Short Time Protection (ST)</strong></td>
<td></td>
</tr>
<tr>
<td>Pick-up (A)</td>
<td>0.4 to 15 (in 4% steps)</td>
</tr>
<tr>
<td>Accuracy</td>
<td>+10%</td>
</tr>
<tr>
<td>Time delay (s)</td>
<td>0.1 0.2 0.3 0.4</td>
</tr>
<tr>
<td>Maximum resettable time (ms)</td>
<td>60 140 230 350</td>
</tr>
<tr>
<td>Maximum breaking time (ms)</td>
<td>140 230 350 500</td>
</tr>
<tr>
<td><strong>Instantaneous Protection (INST)</strong></td>
<td></td>
</tr>
<tr>
<td>Fixed pick-up (A)</td>
<td>50 for M08 to M16 - 65 for M20 to M32</td>
</tr>
<tr>
<td>Adjustable pick-up (A)</td>
<td>50 for M08 to M16 - 65 for M20 to M32</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±15%</td>
</tr>
<tr>
<td><strong>Ammeter (I)</strong></td>
<td></td>
</tr>
<tr>
<td>Power</td>
<td>self-powered</td>
</tr>
<tr>
<td>Display value of</td>
<td>11-2-13-I max</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±1.5% (2)</td>
</tr>
<tr>
<td><strong>Indicators and Memory</strong></td>
<td></td>
</tr>
<tr>
<td>Front face LEDs</td>
<td>Ir-im-I-Ih tripping</td>
</tr>
<tr>
<td>Display</td>
<td>fault current value</td>
</tr>
<tr>
<td>Power (AC 50/60 Hz)</td>
<td>110 V-220 V-380 V (4)</td>
</tr>
<tr>
<td><strong>Maintenance Indicator</strong></td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>between 0 and 655</td>
</tr>
<tr>
<td><strong>Self-Monitoring</strong></td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>'Err' message</td>
</tr>
<tr>
<td><strong>Test</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Optional Functions</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Earth Fault Protection (T)</strong></td>
<td>residual current type (with or without zone selective interlocking)</td>
</tr>
<tr>
<td>On request: Source Ground Return type (W) with zone selective interlocking</td>
<td></td>
</tr>
<tr>
<td>Pick-up (A)</td>
<td>0.2 to 1 (in 2% steps, 1200 A max, 160 A min)</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±10%</td>
</tr>
<tr>
<td>Time delay (s)</td>
<td>0.1 0.2 0.3 0.4</td>
</tr>
<tr>
<td>Maximum resettable time (ms)</td>
<td>60 140 230 350</td>
</tr>
<tr>
<td>Maximum breaking time (ms)</td>
<td>140 230 350 500</td>
</tr>
<tr>
<td>Zone Selective Interlocking</td>
<td>see option M</td>
</tr>
<tr>
<td><strong>Option M</strong> (see possibilities p. 28)</td>
<td>m01 to m16 m17 to m32 with data transmission</td>
</tr>
<tr>
<td>Data Transmission</td>
<td>20 mA current loop (JBUS protocol) 300 bauds</td>
</tr>
<tr>
<td>Number of devices connectable</td>
<td>255</td>
</tr>
<tr>
<td>Power</td>
<td>via module AD</td>
</tr>
<tr>
<td>Opto-Decoupled Outputs</td>
<td>6 x 0.2 A-24 VDC (3) 2 x 0.2 A-24 VDC (3)</td>
</tr>
<tr>
<td>Load Monitoring and Control (R)</td>
<td>(2 possibilities)</td>
</tr>
<tr>
<td>2 load limit settings</td>
<td>0.2 to 1 in 2% steps</td>
</tr>
<tr>
<td>Setting 1</td>
<td>lc1 = ln x...</td>
</tr>
<tr>
<td>(A)</td>
<td>0.5</td>
</tr>
<tr>
<td>Setting 2</td>
<td>lc2 = ln x...</td>
</tr>
<tr>
<td>(A)</td>
<td>0.2</td>
</tr>
<tr>
<td>1 load limit settings</td>
<td>0.2 to 1 in 2% steps</td>
</tr>
<tr>
<td>Setting</td>
<td>A</td>
</tr>
<tr>
<td>tr1 = tr x...</td>
<td></td>
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<tr>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Setting</td>
<td>A</td>
</tr>
<tr>
<td>tr2 = tr x...</td>
<td></td>
</tr>
<tr>
<td>0.25</td>
<td></td>
</tr>
<tr>
<td>1 load limit setting</td>
<td>0.2 to 1 in 2% steps</td>
</tr>
<tr>
<td>Setting</td>
<td>A</td>
</tr>
<tr>
<td>tr1 = tr x...</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
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<tr>
<td>Setting</td>
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</tr>
<tr>
<td>tr2 = tr x...</td>
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<td>0.25</td>
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<tr>
<td>1 load limit setting</td>
<td>0.2 to 1 in 2% steps</td>
</tr>
<tr>
<td>Setting</td>
<td>A</td>
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<td>tr1 = tr x...</td>
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</tr>
<tr>
<td>tr2 = tr x...</td>
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<tr>
<td>0.25</td>
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</tr>
<tr>
<td><strong>Fault Indicators</strong></td>
<td>remote outputs for Ir, Im/L, Ih tripping</td>
</tr>
<tr>
<td><strong>Self-Monitoring</strong></td>
<td>remote outputs</td>
</tr>
<tr>
<td><strong>Zone Selective Interlocking</strong></td>
<td>for earth fault protection</td>
</tr>
<tr>
<td><strong>Other Transmission Possibilities</strong></td>
<td></td>
</tr>
<tr>
<td>Adjustment Parameters</td>
<td>current pick-ups and delay settings</td>
</tr>
</tbody>
</table>

---

(1) 50 for the 4P version
(2) Overall measurement accuracy is ±3%
control units
ST608U (cont.)

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.

without data transmission

<table>
<thead>
<tr>
<th>option</th>
<th>m01</th>
<th>m02</th>
<th>m03</th>
<th>m04</th>
<th>m05</th>
<th>m06</th>
<th>m07</th>
<th>m08</th>
<th>m09</th>
<th>m10</th>
<th>m11</th>
<th>m12</th>
<th>m13</th>
<th>m14</th>
<th>m15</th>
<th>m16</th>
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<tbody>
<tr>
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<tr>
<td>all parameters (see p. 18)</td>
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<td>pick-up lc1 indication</td>
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<tr>
<td>zone selective interlocking on the earth fault protection</td>
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with data transmission

<table>
<thead>
<tr>
<th>option</th>
<th>m17</th>
<th>m18</th>
<th>m19</th>
<th>m20</th>
<th>m21</th>
<th>m22</th>
<th>m23</th>
<th>m24</th>
<th>m25</th>
<th>m26</th>
<th>m27</th>
<th>m28</th>
<th>m29</th>
<th>m30</th>
<th>m31</th>
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<td>all parameters (see p. 18)</td>
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<td>pick-up lc1 indication</td>
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<tr>
<td>zone selective interlocking on the earth fault protection</td>
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</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>LT</th>
<th>ST</th>
<th>INST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting (lr)</td>
<td>In</td>
<td>4 In</td>
<td>Max</td>
</tr>
<tr>
<td>Time delay (tr)</td>
<td>480 s</td>
<td>0.2 s</td>
<td></td>
</tr>
<tr>
<td>Earth fault pick-up (lh)</td>
<td>0.2 In</td>
<td>0.1 s</td>
<td></td>
</tr>
<tr>
<td>Time delay (th)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load monitor (lc1)</td>
<td>In</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load monitor (lc2)</td>
<td>In</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

load monitoring and control (option M)
Operation with 2 load limit pick-ups

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

accessories

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 OPSUP.

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 lr;
- short time protection: to check that tripping occurs at 15 ln;
- earth fault protection: to check that tripping occurs at 0.8 ln.

Power supply: 110, 220 V AC 50/60 Hz.
Masterpact LV air circuit breaker

electrical auxiliaries and mechanical accessories

<table>
<thead>
<tr>
<th>Category</th>
<th>Page</th>
</tr>
</thead>
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<td></td>
</tr>
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<td>remote operation</td>
<td>24</td>
</tr>
<tr>
<td>voltage releases</td>
<td>25</td>
</tr>
<tr>
<td>closing release</td>
<td>25</td>
</tr>
<tr>
<td>indicating contacts</td>
<td>26</td>
</tr>
<tr>
<td>mechanical accessories</td>
<td></td>
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<tr>
<td>locking devices</td>
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</tr>
<tr>
<td>safety shutters, covers and shielding</td>
<td>29</td>
</tr>
<tr>
<td>installation accessories</td>
<td>29</td>
</tr>
<tr>
<td>auxiliaries connection</td>
<td>30</td>
</tr>
<tr>
<td>source changeover systems</td>
<td></td>
</tr>
<tr>
<td>automatic</td>
<td>31</td>
</tr>
<tr>
<td>manual</td>
<td>32</td>
</tr>
</tbody>
</table>
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

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

### 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.
Two types of voltage release can be used for remote opening of Masterpact circuit breakers:

- **Voltage releases**
  - **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 or 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 anti-pumping 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 cancelation of the initial closing command before reclosure of the breaker is possible.

The closing release is supplied on request with the manual operating mechanism.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Voltage Release</th>
<th>Shunt Release</th>
<th>Closing Release</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breaker response time at Un</td>
<td>MN: 90 ms ± 5</td>
<td>MNR: 0.5 s-0.9 s</td>
<td>MX: 40 ms ± 5</td>
</tr>
<tr>
<td></td>
<td>MNR: 1.5 s-3 s</td>
<td></td>
<td>XF: 60 ms ± 5</td>
</tr>
<tr>
<td>Operating thresholds</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opening</td>
<td>0.35 to 0.7 Un</td>
<td>0.7 to 1.1 Un</td>
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<tr>
<td>Closing</td>
<td>0.85 Un</td>
<td></td>
<td>0.85 to 1.1 Un</td>
</tr>
<tr>
<td>Power supply</td>
<td>AC 50/60 Hz (V)</td>
<td>100-110/127-200-220/250-277-380/415-440/480</td>
<td></td>
</tr>
<tr>
<td></td>
<td>500/525(2)</td>
<td>600(4)</td>
<td></td>
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<tr>
<td>Consumption (VA)</td>
<td>20</td>
<td></td>
<td></td>
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<tr>
<td>DC (V)</td>
<td>24 - 30 - 48 - 60 - 100 - 110 - 125 - 200 - 220 - 250</td>
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<tr>
<td>Consumption (W)</td>
<td>15</td>
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</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>auxiliary contacts</th>
<th>type</th>
<th>O</th>
<th>OF</th>
<th>OFSUP</th>
<th>SDE</th>
<th>PF</th>
<th>CE</th>
<th>CD</th>
<th>CT</th>
<th>CH</th>
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<td>changeover</td>
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<td>AC 50/60 Hz (A rms.)</td>
<td>240 V</td>
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<td>10</td>
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<td>DC (A)</td>
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<td>5</td>
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<tr>
<td>L/R ≤ 0.01 s</td>
<td>125 V</td>
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<td>3</td>
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<td>0.3</td>
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<td>250 V</td>
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<td>0.25</td>
<td>0.15</td>
<td>0.15</td>
<td>0.25</td>
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<td>0.25</td>
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<tr>
<td></td>
<td>500 V</td>
<td>0.5</td>
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</tbody>
</table>
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.

pushbutton locking device
by padlocks (not supplied) VBP

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

- 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

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 (optional)
- disconnected (optional)
- disconnected (optional)
- disconnected, connected
- disconnected, connected
- disconnected, connected
- disconnected, connected

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

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

by padlocks (not supplied) as standard
- 1 Profalux key lock VSPC1
- 2 Profalux key locks, identical profiles VSPC2
- 2 Profalux key locks, different profiles VSPC1
- adaptation fixture for Profalux key lock (lock not supplied) 2 VSPC1 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
### Mechanical Accessories (cont.)

<table>
<thead>
<tr>
<th>Locking Devices (cont.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door Interlock</td>
</tr>
<tr>
<td><strong>Optional:</strong> Mounted on the frame, this lock prevents the cubicle door from being opened when the breaker is in the &quot;connected&quot; position. If the breaker is put into the &quot;connected&quot; position with the door open, the latter can be closed without disconnecting the breaker.</td>
</tr>
<tr>
<td><strong>a</strong> Door latch</td>
</tr>
<tr>
<td><strong>b</strong> Racking Interlock</td>
</tr>
</tbody>
</table>

| 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. |

<table>
<thead>
<tr>
<th>Door Interlock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right-hand lock</td>
</tr>
<tr>
<td>Left-hand lock</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Racking Interlock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preventing racking with door open</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Withdrawal/Spring Charged Interlock</th>
</tr>
</thead>
<tbody>
<tr>
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<td>------------------------------------</td>
</tr>
</tbody>
</table>
Earth connection
The earth connection (drawout pattern) is on the left hand side of the frame. It is marked with the symbol ☰

Earth connection

safety shutters (VO)
Optional: Mounted on the fixed portion of drawout circuit breakers, these 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 circuit 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.

partitioning fixture (AC)
Optional: Attached to the fixed portion of drawout circuit 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.

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

door frame (CDP)
Optional: Fixed to the cubicle 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.
mechanical accessories (cont.)

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 the "disconnected" position.
- **optional**: by one or two plugs, disconnectable and accessible from 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

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, independent 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 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

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## Technical Appendix

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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

Masterpact M50
3 or 4 poles
Fixed pattern

Masterpact M63
3 or 4 poles
Drawout pattern

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

**Masterpact M08 to M32**
3 poles or 4 poles

**Masterpact M40**
3 poles
Drawout pattern

---

**Masterpact M40**
4 poles

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

---

**Masterpact M08 to M63**
Fixed pattern
automatic source changeover system
Mounted on frame
interlocking by connecting links for 2 stack-mounted breakers

**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
safety clearance

**drawout breaker**

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

<table>
<thead>
<tr>
<th>Masterpact</th>
<th>connection mode</th>
<th>to insulating parts</th>
<th>to metallic parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>M08 to M63</td>
<td>rear with arc chute cover</td>
<td>A = 0, B = 0</td>
<td>A = 0, B = 0</td>
</tr>
<tr>
<td></td>
<td>rear without arc chute cover</td>
<td>A = 0, B = 15</td>
<td>A = 150, B = 50</td>
</tr>
<tr>
<td></td>
<td>front(1)</td>
<td>A = 300, B = 15</td>
<td>A = 300, B = 50</td>
</tr>
</tbody>
</table>

**fixed breaker**

<table>
<thead>
<tr>
<th>Masterpact</th>
<th>connection mode</th>
<th>to insulating parts</th>
<th>to metallic parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>M08 to M63</td>
<td>rear</td>
<td>A = 150, B = 30</td>
<td>A = 250, B = 70</td>
</tr>
<tr>
<td></td>
<td>front(1)</td>
<td>A = 385, B = 30</td>
<td>A = 385, B = 70</td>
</tr>
</tbody>
</table>
connection arrangements

Masterpact M08N/M10N/M12N
Drawout pattern 3 or 4 poles

Front
Rear
horizontal vertical

(*) fixing dimension for front connection angle
Masterpact M08H/L-M10H/L-M12H/L-M16N/H/L
Drawout pattern 3 or 4 poles

Front

Rear

(horizontal) vertical

(*) fixing dimension for front connection angle
Masterpact M20N/H-M25N/H
Drawout pattern 3 or 4 poles

Front horizontal vertical

Rear horizontal vertical

(*) fixing dimension for front connection angle
Masterpact M20L/M25L/M32H

Drawout pattern 3 or 4 poles

Front

Rear horizontal  vertical

fixed pattern 3 or 4 poles

Front (front view)

Datum

(*) fixing dimension for front connection angle

Rear (top view) horizontal

vertical

Datum

Datum
**Masterpact M40**

*Drawout pattern 3 or 4 poles*

[Diagram of Masterpact M40 with dimensions]

*Fixed pattern 3 or 4 poles*

[Diagram of Masterpact M40 with dimensions]
connection arrangements (cont.)

Masterpact M50
Drawout pattern 3 or 4 poles

Masterpact M63
Drawout pattern 3 or 4 poles
3 poles
Rear (top view)
horizontal

4 poles
Rear (top view)
horizontal

3 poles
Rear (top view)
horizontal

3 poles
Rear (top view)
horizontal

3 poles
Rear (top view)
horizontal

4 poles
Rear (top view)
horizontal

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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.

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.

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.

<table>
<thead>
<tr>
<th>Masterpact version connection</th>
<th>M08N/H/L</th>
<th>M10N/H/L</th>
<th>M12N</th>
<th>M12L</th>
<th>M16N/H</th>
<th>M16L</th>
<th>M20N/H</th>
<th>M20L</th>
<th>M25N/H</th>
<th>M25L</th>
<th>M32H</th>
<th>M40H</th>
<th>M50H</th>
<th>M63H</th>
</tr>
</thead>
<tbody>
<tr>
<td>drawout</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front or rear horizontal</td>
<td>40</td>
<td>800</td>
<td>1000</td>
<td>1250</td>
<td>1250</td>
<td>1250</td>
<td>1250</td>
<td>1250</td>
<td>1250</td>
<td>1250</td>
<td>1250</td>
<td>1250</td>
<td>1250</td>
<td>1250</td>
</tr>
<tr>
<td>Rear vertical</td>
<td>40</td>
<td>800</td>
<td>1000</td>
<td>1250</td>
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<tr>
<td>Fixed</td>
<td>40</td>
<td>800</td>
<td>1000</td>
<td>1250</td>
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</tbody>
</table>

Power dissipation and resistance between inputs/outputs:

<table>
<thead>
<tr>
<th>Power dissipation (W)</th>
<th>M08N/H/L</th>
<th>M10N/H/L</th>
<th>M12N</th>
<th>M12L</th>
<th>M16N/H</th>
<th>M16L</th>
<th>M20N/H</th>
<th>M20L</th>
<th>M25N/H</th>
<th>M25L</th>
<th>M32H</th>
<th>M40H</th>
<th>M50H</th>
<th>M63H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed</td>
<td>66</td>
<td>103</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>220</td>
<td>220</td>
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<td>220</td>
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<td>220</td>
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<td>220</td>
</tr>
<tr>
<td>Input/output resistance (mΩ)</td>
<td>22</td>
<td>22</td>
<td>22</td>
<td>14</td>
<td>14</td>
<td>12</td>
<td>9</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>
time / current characteristic curves

(cont.)

\[ t (s) \]

\[ 10000 \]
\[ 5000 \]
\[ 2000 \]
\[ 1000 \]
\[ 500 \]
\[ 200 \]
\[ 100 \]
\[ 50 \]
\[ 20 \]
\[ 10 \]
\[ 5 \]
\[ 2 \]
\[ 1.5 \]
\[ 1 \]
\[ 0.5 \]
\[ 0.2 \]
\[ 0.1 \]
\[ 0.05 \]
\[ 0.02 \]
\[ 0.01 \]
\[ 0.005 \]
\[ 0.002 \]
\[ 0.001 \]
\[ 0.0005 \]

\[ x \ ln \]

\[ lr = 0.4 \]

\[ 10 \times ln \]

\[ Im = 2 \]

\[ 10 \times lr \]

\[ \text{Inst}^* \]

\[ \ln \] current rating of sensor

\[ lr \] long time setting

* Inst.
time/current characteristic curves
(cont.)

\[ t_r = 0.4 \times T \times \ln(r) \]

\[ i_m = 10 \times t_r \times \ln(r) \]

\[ i_n = \ln(r) \times \ln(t) \]

*Inst*
time/current characteristic curves (cont.)

ST418S

$t (s)$

$10000$
$5000$
$2000$
$1000$
$500$
$200$
$100$
$50$
$20$
$10$
$5$
$2$
$1$

$lr = 0.4 \_ \_ \_ 1 \times \ln$

$lm = 1.6 \_ \_ \_ 10 \times lr$

$0.3$
$0.2$
$0.1$
$0$

In current rating of sensor
ST308/ST408/ST318/ST418 earth fault protection T

\[ I_h = 0.2 + 0.6 \times \ln (\text{In} \leq 2000A) \]
\[ I_h = 0.2 + 0.4 \times \ln (\text{In} > 2000A) \]

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time/current characteristic curves
(cont.)

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

\[
\begin{align*}
\text{current rating of sensor} &= \text{Ir} \\
\text{current rating of sensor} &= \text{lc1} = 0.8 \times \text{lr} \\
\text{current rating of sensor} &= \text{lc2} = 0.8 \times \text{lr}
\end{align*}
\]
In current rating of sensor pick-up from In to:

**ST608U**

- \( I_r = 0.4 \times 1 \times \text{In} \)
- \( t_r = 15 \times 480 \text{ s} \)
- \( I_m = 0.4 \times 15 \times \text{In} \)

**Inst:**
time/current characteristic curves (cont.)

ST608U option T

ln = 0.2 \times ln

max. 1200 A

In current rating of sensor

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ST608U option M
load monitoring and control
2 loads limits

$t (s)$

Current rating of sensor $I_r$ = 0.4 $x$ $I_n$
Long time setting $I_{c1}$ = 0.2 $x$ $I_n$
Load settings $I_{c2}$ = 0.2 $x$ $I_n$

$t_{r1} = t_r / 2$
$t_{r2} = t_r / 4$

$t_r = 15$ $s$ $= 480$ $s$

$10000$ $5000$ $2000$ $1000$ $500$ $200$ $100$ $50$

In current rating of sensor
$t_r$ long time setting

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time/current characteristic curves
(cont.)

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

In current rating of sensor
lr long time setting
(tr = time delay)
lc1 load limit
lc2 load limit

In = 1 x lr
In = 1 x lc1
In = 1 x lc2

tr = 15 s
tr = 480 s
tr = tr / 2
tr2 = 60 s
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)
**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
**PF:** ready to close - contact (10 A)

---

**CD:** disconnected position contact (10 A, 240 V AC)

---

Wiring of the MNR (modified diagram)

---

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

---

Diagrams shown with circuits deenergised breaker open and in connected position, springs charged and relays in normal position.

---

(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.
ST608UM (m01 to m32)
ST608UTM (m01 to m32)
see data transmission version (m17 to m32) on following page

Frame Auxiliaries

- 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 NO contacts (10 A, 240 V AC)
- SDE: fault trip indication contact (10 A, 240 V AC)
- CH: charging motor limit switch contact
- m01: option equipped with 6 opto-decoupled outputs to m16: 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.

Wiring of the MNR (modified diagram).

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

(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.
wiring diagrams (cont.)

<table>
<thead>
<tr>
<th>module</th>
<th>terminal number</th>
</tr>
</thead>
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<td>m03</td>
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<td>m07</td>
<td>LT</td>
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<td>m08</td>
<td>LT</td>
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<tr>
<td>m09</td>
<td>LT</td>
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<td>m10</td>
<td>LT</td>
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<tr>
<td>m11</td>
<td>LT</td>
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<td>m12</td>
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<td>m14</td>
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</tr>
<tr>
<td>m15</td>
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<tr>
<td>m16</td>
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transmission reception outputs

<table>
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<td>m17</td>
<td>ST/Inst. LT</td>
</tr>
<tr>
<td>m18</td>
<td>ST/Inst. AS</td>
</tr>
<tr>
<td>m19</td>
<td>T ST/Inst.</td>
</tr>
<tr>
<td>m20</td>
<td>T AS</td>
</tr>
<tr>
<td>m21</td>
<td>T Z</td>
</tr>
<tr>
<td>m22</td>
<td>Z AS</td>
</tr>
<tr>
<td>m23</td>
<td>Z limit 1</td>
</tr>
<tr>
<td>m24</td>
<td>Z shed 1</td>
</tr>
<tr>
<td>m25</td>
<td>T shed 1</td>
</tr>
<tr>
<td>m26</td>
<td>ST/Inst. limit 1</td>
</tr>
<tr>
<td>m27</td>
<td>ST/Inst. shed 1</td>
</tr>
<tr>
<td>m28</td>
<td>limit 2 limit 1</td>
</tr>
<tr>
<td>m29</td>
<td>shed 2 shed 1</td>
</tr>
<tr>
<td>m30</td>
<td>reconn. 2 shed 1</td>
</tr>
<tr>
<td>m31</td>
<td>shed 2 AS</td>
</tr>
<tr>
<td>m32</td>
<td></td>
</tr>
</tbody>
</table>

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 lc1 setting overrun
- limit 2/indication of lc2 setting overrun
- shed 1/load shedding command according to lc1 setting(limit 1)
- shed 2/load shedding command according to lc2 setting
- reconn. 2/load reconnection command according to lc2 setting (limit 2)

self-monitoring:

- AS: indication of control unit fault or overtemperature

connection modifications for data transmission: options m17 to m32
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 with local and remote data safeguard battery

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

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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
<table>
<thead>
<tr>
<th>Normal</th>
<th>O</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standby</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>
wiring diagrams (cont.)

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  | 0 | 0 |
| Standby | 0 | 0 | 1 |

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

Switch position

OFF
NORMAL
STANDBY
AUTO

TRANSFER TO STANDBY SOURCE

BN: closed
BS: open

STANDBY SOURCE

BN: open
BS: closed

NORMAL

BN: closed
BS: open

NORMAL OPERATION

BN: open
BS: closed

STANDBY OPERATION

BN: open
BS: closed

TRANSFER TO NORMAL OPERATION

BN: closed
BS: open

NORMAL OPERATION

BN: closed
BS: closed

STANDBY OPERATION

BN: open
BS: closed

NORMAL OPERATION

BN: open
BS: closed

STANDBY OPERATION

BN: closed
BS: open

NORMAL OPERATION

BN: closed
BS: closed

STANDBY OPERATION

BN: open
BS: closed

NORMAL 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

<table>
<thead>
<tr>
<th></th>
<th>Normal</th>
<th>Standby</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

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

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 x 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

Note: Terminal 84 is not included on control unit ST04.
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.

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
  - complete drawout
  - drawout - moving portion only
  - drawout - fixed portion only
- **breaker connections**
  - top horizontal
    - P
    - C
    - A
  - vertical
    - F
    - D
    - A
  - front
    - D
    - A
- **neutral protection**
  - None
  - N
  - N/2
- **environment**
  - standard T2 tropicalisation
  - special conditions

### 2. control unit

- **instantaneous protection**
  - ammeter
  - power supply 110/220 or 240/440 V AC
  - direct
- **selective protection**
  - ammeter
  - power supply 110/220 or 240/440 V AC
  - direct
- **earth fault protection**: residual
  - residual with zone selective interlocking
  - source ground return
  - TF
  - TJ
  - ZF
  - ZJ
  - WF
  - WJ
- **load monitoring and control**
  - RF
  - RJ
- **fault indications**
  - on front face
  - on front face and via remote output
  - power supply 24/220 V DC-AC
  - 380 V AC
  - data safeguard battery
  - F
  - J
  - direct
  - AD
  - BAT
- **universal protection**
  - power supply 110/220/380 V AC
  - 24/30 48/60 125 V DC
  - data safeguard battery
  - service continuity
  - module type
  - earth fault protection
  - residual
  - source ground return
  - ST608U
  - direct
  - AD
  - BAT
  - YES
  - NO
  - M
- **control unit accessories**
  - relay module for 3 A output
  - support accessory
  - mini battery unit (simplified test kit)
  - calibration test kit
  - sealable cover
  - MR6
  - ABM
  - BU
  - ME
  - PB
3. electrical auxiliaries

- manual operating mechanism only
- electrical operating mechanism
  - geared motor
  - operation counter
  - closing release
  - voltage release (specify below)

- voltage releases
  - shunt release
  - instantaneous undervoltage release
  - time delayed undervoltage release
    with instant wiring

- indicating contacts
  - 4 changeover switches
  - 24 additional changeover switches
  - « ready to close » contact
  - 4 connected position switches
  - 2 disconnected position switches
  - test position switch

- auxiliary connection accessories
  - disconnectable plugs (1 or 2)
  - additional terminal block

4. mechanical and installation accessories

- pushbutton locking device
- « off » position lock

- « disconnected » position lock

- « disconnected-connected-test » positions lock

- installation accessories
  - righthand door lock
  - lefthand door lock
  - racking interlock
  - withdrawal/spring charged interlock
  - safety shutters
  - shutter lock (1 or 2)
  - arc chute cover
  - terminal shield
  - interphase barrier
  - partitioning fixture
  - door frame
  - door frame with transparent cover
  - breaker mismatch protection

5. manual and automatic source changeover

- separate components

<table>
<thead>
<tr>
<th>mechanical interlock</th>
<th>fixed/mixed</th>
<th>drawout</th>
</tr>
</thead>
<tbody>
<tr>
<td>VM2FT</td>
<td>VM2CT</td>
<td></td>
</tr>
<tr>
<td>VM2FC</td>
<td>VM2CC</td>
<td></td>
</tr>
<tr>
<td>VM33FT</td>
<td>VM33CT</td>
<td></td>
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<tr>
<td>VM32FT</td>
<td>VM32CT</td>
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<td>VM31FT</td>
<td>VM31CT</td>
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<td>AIS415C</td>
<td>AIS240C50H</td>
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</table>

- complete assemblies

<table>
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<th>drawout</th>
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</thead>
<tbody>
<tr>
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</tbody>
</table>

  2 breakers alone
  2 breakers with controller
  diagram no.\(^\text{11}\)
  controller voltage position
  standby
  down
  up

  3 breakers alone
  diagram no.\(^\text{11}\)
  mechanical interlock
  position

  fixed/mixed | drawout |
 -------------|--------|
  VM33FT      | VM33CT  
  VM32FT      | VM32CT  
  VM31FT      | VM31CT  

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<td>connection</td>
<td>5</td>
</tr>
<tr>
<td>precautions</td>
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<td>12</td>
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<tr>
<td>derating</td>
<td>13</td>
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<td>derating tables</td>
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<td>guide de déclassement</td>
<td>15</td>
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<tr>
<td>en tableau</td>
<td></td>
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<tr>
<td>modules, auxiliaries</td>
<td>19</td>
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<tr>
<td>outline drawings and</td>
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<td>connection arrangement</td>
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<tr>
<td>plans d’installation et</td>
<td>21</td>
</tr>
<tr>
<td>de raccordement</td>
<td></td>
</tr>
</tbody>
</table>
LV power air circuit breaker

disjoncteur BT forte intensité

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

<table>
<thead>
<tr>
<th></th>
<th>W / L</th>
<th>H / H</th>
<th>D / P</th>
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<tbody>
<tr>
<td>M08 to M32</td>
<td>435</td>
<td>439</td>
<td>367</td>
</tr>
<tr>
<td>M40</td>
<td>550</td>
<td>439</td>
<td>367</td>
</tr>
<tr>
<td>M50</td>
<td>815</td>
<td>484</td>
<td>367</td>
</tr>
<tr>
<td>M63</td>
<td>1045</td>
<td>484</td>
<td>367</td>
</tr>
</tbody>
</table>

Dimensions (mm) without connections 3P debroachable
LV power air circuit breaker

disjoncteur BT forte intensité

Masterpact

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.

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.
LV power air circuit breaker
disjoncteur BT forte intensité
Masterpact

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.

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).

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.

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 chassiis.

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.

ecran 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 screen: see page 28 and 29.

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 ainsipossible 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.
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 held 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 comme indiqué ci-après:
- dans tous les cas, respecter les mêmes règles générales que pour les barres, soit:
  - extrémités de câbles correctement positionnées avant mise en place de la visserie.
  - câbles solidarisés, et solidement fixés à l'ossature E.
LV power air circuit breaker
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.

<table>
<thead>
<tr>
<th>Isc (kAms)</th>
<th>30</th>
<th>50</th>
<th>65</th>
<th>80</th>
<th>100</th>
<th>150</th>
</tr>
</thead>
<tbody>
<tr>
<td>lcc (kAeff)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>distance (mm)</td>
<td>350</td>
<td>300</td>
<td>250</td>
<td>200</td>
<td>150</td>
<td>150</td>
</tr>
</tbody>
</table>

efforts électromagnétiques
- 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 électromagnétiques qui s'appliquent entre les barres de chaque phase lors d'un court-circuit.

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 (mm) | Ø drilling perçage (mm) | tightening torque (m.daN) with washers:
couple de serrage (m.daN) avec rondelles:
grower or flat plates ou grower
grower or corrugated contact or éventail |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>11</td>
<td>3,75</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

(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).

use the same values 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

<table>
<thead>
<tr>
<th>e (mm)</th>
<th>radius of curvature r mini recommended conseillé</th>
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LV power air circuit breaker
disjoncteur BT forte intensité
Masterpact

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: $T_a$.
- busbar material is high conductivity copper.

drawout breaker, vertical connections
appareil débrochable, barres sur chant

### 1. drawout breaker, vertical connections

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<tr>
<th>Maximum service current</th>
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LV power air circuit breaker
disjoncteur BT forte intensité
Masterpact

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

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

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

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(1) : except M12N
(2) : except M25L
LV power air circuit breaker  
*disjoncteur BT forte intensité*

**Masterpact**

### 3. fixed breaker, vertical connections

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### 4. fixed breaker, horizontal connections

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<td>6b.100 x 5</td>
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</table>
mounting the circuit breakers

It is important to distribute the weight of the equipment uniformly 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.

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.

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
LV power air circuit breaker

disjoncteur BT forte intensité

Masterpact

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).

safety clearance

- 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 dm³)

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<td>210</td>
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<td>M63</td>
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### Drawout Breaker

disjoncteur débrochable

#### Types of Connection

<table>
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<tr>
<th>Mode de raccordement</th>
<th>Avec écrans isolants</th>
<th>Avec parties métalliques</th>
<th>Avec barres sous tension</th>
<th>Avec barres sous tension + écrans isolants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prise avant</td>
<td>A 385 B 30 C 0</td>
<td>A 385 B 70 C 0</td>
<td>A 1085 B 420 C 0</td>
<td>A 435 B 100 C 10</td>
</tr>
<tr>
<td>Sans capot arrière</td>
<td>150 50 45</td>
<td>150 50 45</td>
<td>100 400 445</td>
<td>50 85 70</td>
</tr>
<tr>
<td>Avec capot arrière</td>
<td>0 15 45</td>
<td>0 25 45</td>
<td>60 85 75</td>
<td>20 35 65</td>
</tr>
</tbody>
</table>

### Fixed Breaker

disjoncteur fixe

#### Types of Connection

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<th>Mode de raccordement</th>
<th>Avec écrans isolants</th>
<th>Avec parties métalliques</th>
<th>Avec barres sous tension</th>
<th>Avec barres sous tension + écrans isolants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prise avant</td>
<td>A 385 B 30 C 0</td>
<td>A 385 B 70 C 0</td>
<td>A 1085 B 420 C 0</td>
<td>A 435 B 100 C 10</td>
</tr>
<tr>
<td>Arrière</td>
<td>150 50 45</td>
<td>150 50 45</td>
<td>100 400 445</td>
<td>50 85 70</td>
</tr>
<tr>
<td>Avec capot arrière</td>
<td>0 15 45</td>
<td>0 25 45</td>
<td>60 85 75</td>
<td>20 35 65</td>
</tr>
</tbody>
</table>
LV power air circuit breaker
disjoncteur BT forte intensité
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 degre 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.

<table>
<thead>
<tr>
<th>Power dissipation</th>
<th>Puissance dissipée</th>
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<tr>
<td>M08 to M20</td>
<td>M08M/H M10M/H M12M/H M16M/H M20M/H</td>
</tr>
<tr>
<td>fixed</td>
<td>66 103 150 100 220 180 250</td>
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<tr>
<td>draw.</td>
<td>160 250 360 230 460 365 500</td>
</tr>
<tr>
<td>M25 to M63</td>
<td>M25M/H M25M/H M32M/H M40M/H M50M/H M63M/H</td>
</tr>
<tr>
<td>fixed</td>
<td>260 390 500</td>
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<td>draw.</td>
<td>520 780 803 1250 1150 1200</td>
</tr>
</tbody>
</table>

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

NB: Ces valeurs ont été déterminées lors des essais d'échauffement (valeurs supérieures à la puissance P = R I²).

resistance between inputs/outputs
values measured per pole in μΩ.

<table>
<thead>
<tr>
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<th>résistance entrée/sortie</th>
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<tr>
<td>fixed</td>
<td>22 22 22 14 9</td>
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<tr>
<td>draw.</td>
<td>53 53 53 32 31</td>
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<tr>
<td>M25 to M63</td>
<td>M25M/H M25M/H M32M/H M40M/H M50M/H M63M/H</td>
</tr>
<tr>
<td>fixed</td>
<td>8 10 10</td>
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<tr>
<td>draw.</td>
<td>17 23 15 15 9</td>
</tr>
</tbody>
</table>
### 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 ambient temperatures 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.

---

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<th>Masterpact</th>
<th>M08N/H/L</th>
<th>M10N/H/L</th>
<th>M12N/H/L</th>
<th>M16N/H</th>
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</tr>
</tbody>
</table>

| rear horizontal or vertical prise arrière sur plat |          |         |          |        |      |          |        |      |      |      |      |      |
| 40 800     | 1000       | 1250     | 1600     | 1600   | 2000 | 2500     | 2500   | 3200 | 3200 | 4200 | 5200 |      |
| 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       | 1200     | 1550     | 1500   | 1900 | 2250     | 2000   | 2800 | 3100 | 4000 | 4800 |      |

---

**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.
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
(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 (1250 A)

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<th>connection type</th>
<th>mode de raccordement</th>
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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

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LV power air circuit breaker
disjoncteur BT forte intensité
Masterpact

totally enclosed switchboard
(tableau non ventilé
(IP54))

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

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

Masterpact

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LV power air circuit breaker
disjoncteur BT forte intensité
Masterpact

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 supérieure 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 filière.

Detail of the WAGO connector
Détail borne type WAGO

9 mm

0.6 ≤ s ≤ 2.5 mm²
LV power air circuit breaker

disjoncteur BT forte intensité

Masterpact

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installation
Masterpact
M08 to M32

safety clearance (see page 12)
zone de sécurité (voir page 12)

"disconnected" position
position "débroché"

Fixing detail
Détail fixation

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

Door cutting
Découpe de porte

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

(g): see connection drawings/voir schémas de raccordement
installation
Masterpact
M08 to à M32

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

necessary space for removing the arc chutes
zone nécessaire pour l'extraction des chambres

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
installion
Masterpact
M40(3p)

safety clearance (see page 12)
zone de sécurité (voir page 12)

“disconnected” position
position “débroché”

Fixing detail
Détail fixation

Drilling for fixing:
Percage pour fixation:
on base plate (q)
sur platine (q)
on rails (q)
sur ferrures (q)

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

(g): see connection drawings/voir schémas de raccordement
Installation
Masterpact
M40(4p)/M50(3p)

Safety clearance (see page 12)

Zone de sécurité (voir page 12)

"Disconnected" position
Position "débranche"

Fixing detail
Détail fixation

Drilling for fixing:
Percage pour fixation:
on base plate (q)
sur platine (q)
on rails (q)
sur ferrures (q)

Door cutting
Découpe de porte

Drilling for fixation of the door frame
Percage porte pour fixation du faux plastron
Installation
Masterpact
M50(4p)/M63(3p)/M63(4p)

Safety clearance (see page 12)
zone de sécurité (voir page 12)

"Disconnected" position
position "débroché"

Fixing detail
Détail fixation

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

Door cutting
Découpe de porte

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

(g): see connection drawings/voir schémas de raccordement
installation
Masterpact
M08 to 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

dimensions (mm)

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<td>L(4p)</td>
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accessory to be manufactured
accessoire à réaliser

doctor interlocking catch
réalisation du verrouillage

breaker in “disconnected” position
opening of the door unlocked
appareil position “déconnecté”
ouverture porte non verrouillée

doctor locking
verrouillage de porte

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installation
Masterpact

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

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

fixed breaker
appareil fixe

terminal shields
capot sur borniers
capot sur chambres
M08 to/à M40(3p)

terminal shields
capot sur borniers
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)

M40(4p), M50(3p), M50(4p), M63(3p), M63(4p)

datum référence

ACB's basis base appareil

www.ElectricalPartManuals.com
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

installation
montage
≤ 2000A to à 4000A

neutral current sensor
transformateur courant extérieur

dimensions
dimensions
≤ 2000A

5000/6300A

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 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 alignment in respect of the fixing point of the interlocking side: ± 2mm
Les appareils alignés en fonction du point fixe de l'interverrouillage: ± 2mm

For other figures for installation and connection, please refer to breakers drawings.
Pour toutes les autres figures d'installation et de connexion, veuillez consulter les dessins des appareils.
installation
Masterpact
M08 to M32
3 and 4 poles fixed or drawout pattern
3 et 4 pôles fixe ou débrochable

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 alignment in respect of the fixing point of the interlocking side : ± 2mm
Pour toutes les autres cotés d'installation et raccordement
ACB's basis
30 mini
base appareil
30 maxi
60 maxi

For other figures for installation and connection,
please refer to breakers drawings
Pour toutes les autres cotés d'installation et raccordement
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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 M63
3 and 4 poles drawout pattern
3 et 4 pôles débrochable

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 alignment in respect of the fixing point of the interlocking side: ±2 mm
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.

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installation
Masterpact
M08 to M32
3 and 4 poles fixed and drawout pattern
3 et 4 pôles fixe ou débrochable

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 alignment in respect of the fixing point of the interlocking side: ± 2mm
Alignment des appareils en respect de la pointe de l'interverrouillage : ± 2mm

For other figures for installation and connection, please refer to breakers drawings
Pour toutes les autres figures d'installation et de connexion, reportez-vous aux dessins d'appareil.
connection  
**raccordement**  
**Masterpact**  
**M08N-M10N-M12N**  

**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 en cas de prise avant)

---

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

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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

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connection
raccordement
Masterpact
M08N-M10N-M12N

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
avec capot sur chambres
avec ou sans plage complémentaire (1)

without arc chute cover
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

drawout pattern
débrochable

front connection (1)
prise avant (1)

rear connection
prise arrière
horizontal terminals vertical terminals
plages horizontales plages verticales

fixed pattern
fixe

front connection (1)
prise avant (1)

rear connection
prise arrière
horizontal terminals vertical terminals
plages horizontales 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

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

optional arc chute cover
(excepted with top front connection)
option capot sur chambres
(sauf encas de prise avant)
connection
raccordement
Masterpact
M08H/L-M10H/L
M12H/L-M16N/H/L

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

fixed pattern
horizontal or vertical terminals
and front connection
fixe
plages horizontales ou verticales
et prise avant
connection
raccordement
Masterpact
M08H/L-M10H/L
M12H/L-M16N/H/L

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 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)
ecran nécessaire (cf. : périmètre de sécurité)
(2): front connection screen compulsory
prise avant obligatoire
Masterpact
M20N/H-M25N/H

Connection
Raccordement

drawout pattern
débrochable

front connection (1)
prise avant (1)

rear connection
prise arrière

horizontal terminals
plages horizontales

drawout pattern
débrochable

horizontal terminals
plages horizontales

vertical terminals
plages verticales

306
120

12,5

fixed pattern
fixe

front connection (1)
prise avant (1)

rear connection
prise arrière

horizontal terminals
plages horizontales

vertical terminals
plages verticales

fixed, drawout pattern
fixe, débrochable

front connection (1)
prise avant (1)

rear connection
prise arrière

horizontal terminals
plages horizontales

datum
reference

vertical terminals
plages verticales

datum
reference

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connection  
raccordement  
Masterpact  
M20N/H-M25N/H

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 en cas de prise avant)

front connection  
(screen compulsory, see page 28)  
prise avant  
(ecran obligatoire, voir page 28)
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 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
avec capot sur chambres
avec ou sans plage complémentaire (1)

without arc chute cover
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  

**Drawout Pattern**  
**débrochable**

- **Front Connection (1)**  
  - prise avant (1)
  - horizontal terminals  
  - vertical terminals

- **Rear Connection**  
  - prise arrière
  - horizontal terminals  
  - vertical terminals

**Fixed Pattern**  
**fixe**

- **Front Connection (1)**  
  - prise avant (1)
  - horizontal terminals  
  - vertical terminals

- **Rear Connection**  
  - prise arrière
  - horizontal terminals  
  - vertical terminals

---

(1) : front connection screen compulsory
connection
raccordement
Masterpact
M20L-M25L-M32H
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
(saufen cas de prise avant)

front connection
(screen compulsory, see page 28)
prise avant
(écran obligatoire, voir page 28)
connection
raccordement
Masterpact
M20L-M25L-M32H

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
(fécran obligatoire, voir page 28)
connection
raccordement
Masterpact
M20L-M25L-M32H

with or without vertical terminal
avec ou sans plage complémentaire

fixed or drawout pattern
horizontal connection
fixe ou débrochable
raccordement horizontal

with busbar extension + supports
avec queue de barre + supports
connection
raccordement
Masterpact
M20L-M25L-M32H

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
avec capot sur chambres
avec ou sans plage complémentaire (1)

without arc chute cover
sans capot sur chambres
avec ou sans plage complémentaire (1)
+ front connection (2)

(1): screen necessary (see safety perimeters)
ecran nécessaire (cf : périmètre de sécurité)
(2): front connection screen compulsory
ecran prise avant obligatoire
installation and connection
installation et raccordement
Masterpact
M08 to/à M32

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

without complementary terminal
sans plages complémentaires

vertical terminal above horizontal connection
plage complémentaire sur connection à plat

instructions and advises
instructions et conseils
connection
raccordement
Masterpact
M40

drawout pattern
débrochable

3 poles
3 pôles

horizontal terminals
plages horizontales

vertical terminals
plages verticales

4 poles
4 pôles

horizontal terminals
plages horizontales

vertical terminals
plages verticales

www.ElectricalPartManuals.com
connection  
connection  
raccordement  
Masterpact  
M40  

horizontal or vertical terminals  
débrochable  
plages horizontales ou verticales  

optional arc chute cover  
option capot sur chambres  

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connection
raccordement
Masterpact
M50

3 poles
3 pôles

4 poles
4 pôles
connection
raccordement
Masterpact
M63

3 poles
3 pôles

horizontal terminals
plages horizontales

vertical terminals
plages verticales

datum
reference

345
15
362

horizontal terminals
plages horizontales

vertical terminals
plages verticales

datum
reference

350
350
350
260

25 32.5
25 25
25 25
25 25
25 25

79.5

12.5

117.5

117.5


(2)

4 poles
4 pôles

horizontal terminals
plages horizontales

vertical terminals
plages verticales

datum
reference

345
15
362

horizontal terminals
plages horizontales

vertical terminals
plages verticales

datum
reference

206
287

25 25 25 25
25 25 25 25
25 25 25 25
25 25 25 25

25
25
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25
25

79.5

12.5
connection
raccordement
Masterpact
M50/M63

drawout pattern
horizontal or vertical terminals
débrochable
plages horizontales ou verticales

optional arc chute cover
option capot sur chambres
connection
raccordement
Masterpact
M50/M63
drawout pattern
horizontal or vertical connection
débrochable
raccordement horizontal ou vertical

horizontal connection
raccordement horizontal

vertical connection
raccordement vertical
As standard, specifications and designs change from time to time, please ask for confirmation of the information given in this publication.

En raison de l'évolution des normes et du matériel, les caractéristiques indiquées par le texte et les images de ce document ne représentent qu'après confirmation.