Motor circuit breakers

Debut!
Bring a breath of fresh air into a Motor Control Circuit!

With Mitsubishi Electric’s range of smart Motor circuit breakers!

**MMP-T series**

**Motor circuit breakers**

**Customers’ Needs**

- Outline of Motor circuit breakers...
- Advantages of Adopting Motor circuit breakers...
- Specifications...

**Optional Unit**

- Outline Drawing...
- UL Standard and SCCR...
- About Warranty...

**Information of Our FA-related Products**
Do these requirements sound familiar?

The new MMP-T Series can help you solve these issues.

Desire to down-size the machine control panels

Desire to increase wiring efficiency

Desire to meet global demands

Down-sizing
Smart wiring
Safety & Quality
Global
Worldwide coverage
Standard
What is a Motor circuit breaker?

A Motor circuit breaker is a device integrating Low voltage circuit breakers and Thermal Overload Relays functions. This device is capable of protecting the motor branch circuits from overload, phase-loss, and short-circuit alone. It enables even more secure wiring and motor protection.

<table>
<thead>
<tr>
<th>Conventional method</th>
<th>A method using Motor circuit breaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low voltage circuit breakers</td>
<td>Integration of Low voltage circuit breakers and Thermal Overload Relays functions</td>
</tr>
<tr>
<td>Magnetic Contactor</td>
<td>Motor circuit breaker</td>
</tr>
<tr>
<td>Thermal Overload Relays</td>
<td>Magnetic Contactor (Released at the same time, New MS-T Series)</td>
</tr>
</tbody>
</table>

### Basic type

- **MMP-T32**
  - Rated current (A): 0.16 to 32 (15 types)
  - Rated short-circuit breaking capacity (kA): 100
  - Outside dimension (mm) W x H x D: 45 x 96 x 76

---

What is the role of a Motor circuit breaker in a motor circuit?

The motor circuit requires various roles, including disconnection, circuit on/off switching, short-circuit protection, device protection, motor control, and overload protection. A motor circuit consisting of a Low voltage circuit breakers, Magnetic Contactor, and Thermal Overload Relays is typically adopted, and each of the devices has its own independent role. On the other hand, in a motor circuit consisting of a Motor circuit breaker and a Magnetic Contactor, only motor control is provided by the Magnetic Contactor, and other functions are provided by the Motor circuit breaker.

When the motor circuit is configured in a Low voltage circuit breakers and Magnetic motor starters:

- Disconnection
- Circuit on/off switching
- Short-circuit protection
- Device protection
- Motor control
- Overload protection

When the motor circuit is configured in a Motor circuit breaker and Magnetic Contactor:

- Disconnection
- Circuit on/off switching
- Short-circuit protection
- Device protection
- Motor control
- Overload protection

When you use a Motor circuit breaker, then...

(Magnetic Contactor (Released at the same time, New MS-T Series))
Why is a Motor circuit breaker required at this time?

When exporting products to foreign countries including the U.S.A. and European countries, not only the device component but also the motor circuit are required to comply with the standards of the respective countries including UL and EN standards. The electric wires and devices that make up the motor control circuit (Low Voltage Circuit Breakers, Fuse, Magnetic Contactor, Thermal Overload Relays) must be protected under a short-circuit condition. In addition, we need to select each device considering their functions and characteristics. Thus, we have encountered difficulties in realizing the reliable circuit protection at times.

The device to reduce such burden is our "Motor circuit breaker". Undertaking multiple protection roles stated above, the Motor circuit breaker can not only protect electric wires and load devices from short-circuit accident but also simplify motor circuit combination. In addition, in North America, a control panel shall be marked with SCCR (short-circuit current rating), but even high SCCR that cannot be covered by the combination of Low voltage circuit breakers and Magnetic motor starters can be covered by the use of a Motor circuit breaker.

Having these advantages tends to increase demand for "Motor circuit breakers".

In case of application in North America

Motor circuit general combination

1. Short-circuit protection device for power supply circuit
2. Motor circuit disconnect switch
3. Branch circuit protection device
4. Motor control device
5. Motor overload protection device

General motor circuits have many devices to be combined and are complicated.

Combinations using Motor circuit breaker

Application of a Motor circuit breaker can integrate the role of 1. path disconnection, 2. motor control and 3. motor overload protection, to make the circuit simple.

Type E/F combination

In addition, using the line side terminal adapter kit and short-circuit indicator unit enables the Type E/F+1 circuit combination and also enables 4. branch circuit protection in addition to the protection functions of 1, 2, and 3.

Combination of Motor circuit breaker and option enables wiring reduction and space saving. This allows us to respond to the needs of down-sizing the control panel, which increases the demand for Motor circuit breakers. (For details about wiring reduction & space saving, please refer to the next section.)

In order to connect motor circuit breaker and magnetic contactor, please use the connection conductor unit.

∗1 MMP-T32LF is not applicable.

Advantages of Adopting This Device

Space-saving design has realized down-sizing of the control panel.

Space saving-applied example

Conventional method

A method in which a Motor circuit breaker is used

The control panel is even more down-sized!
Advantages of Adopting This Device

Wiring reduction
smart wiring

Wiring streamlining terminal

● Using a wiring streamlining terminal facilitates wet the wiring!

1. Screw holder lifts up the screw
2. Insert a round solderless terminal
3. Tighten the screw

+ Fast wiring terminals are optional products. (Model name: Add BC to the type designation. E.g.: MMP-T32BC)

Wiring reduction-applied example

Electric wire-used wiring example

Conductor-joint-unit-used wiring example

Both common electric wire-used wiring and unit-used wiring are available! Using the unit facilitates combination with respective devices. In addition, the terminal connected to control terminal of magnetic contactor arranged at the front also facilitates the wiring, thus contributing to improvement of production.

Safety & Quality

Safe and reliable MMP-T32

● As with the combination of Low voltage circuit breakers, Magnetic Contactor, and Thermal Overload Relays, the combination of Motor circuit breaker and Magnetic Contactor can prevent secondary disasters.

Global standard

Worldwide coverage

Acquisition of main international standards can support customers’ overseas business.

● Certification to various major international standards

Not only major international standards such as IEC, JIS, UL, CE, and CCC but also other national standards are certified. This will help our customers expand their business in foreign countries. This will help our customers expand their business in foreign countries.

<table>
<thead>
<tr>
<th>Applicable standard</th>
<th>Safety certificate standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC</td>
<td>UL, C &amp; Canada</td>
</tr>
<tr>
<td>JIS</td>
<td></td>
</tr>
</tbody>
</table>

UL60947-4-1A Type E/F is also covered.+1

Compliance of the device to UL’s Type EF combination can surely respond to export to the U.S.A. For details, please read refer to Page 22.

+1 MMP-T32LF is not applicable.
Specifications

Key points

- Wiring-supporting BC terminal (Option)
- Adjustment dial settable to full load current
- Optional short-circuit indicator unit can be added speeding up fault diagnosis.
- Breaker type operating handle with off-lock hole.
- Integrated finger protection provides convenient safety
- A round solderless terminal is applicable.
- The compact breaker design also allows Auxiliary contact unit (AL). and alarm contact unit (AL).

Specification List

<table>
<thead>
<tr>
<th>Frame A</th>
<th>Specifications</th>
<th>MMP-T32/MMP-T32BF/LF/MMP-T32BCFLF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type name</td>
<td>RECV-MMP-T32LFLF, MMP-T32BCFLF</td>
<td>ENS0947-2, ENS0947-4-1, IEC60947-2, IEC60947-4-1, GB14048.2</td>
</tr>
<tr>
<td>Standard</td>
<td>JIS C8201-2-1 Ann.1, 8201-4-1, 60947-2, 60947-4-1, IEC60947-2, IEC60947-4-1, GB14048.2, UL60947-4-1A, CSAC22.2NO.60947-4-1</td>
<td></td>
</tr>
<tr>
<td>Number of poles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Handle shape</td>
<td></td>
<td>Tumbler handle</td>
</tr>
<tr>
<td>Rated current in [A]</td>
<td></td>
<td>0.1 to 32</td>
</tr>
<tr>
<td>Rated operational voltage Ue [V]</td>
<td></td>
<td>200 to 690V</td>
</tr>
<tr>
<td>Rated frequency [Hz]</td>
<td></td>
<td>50/60</td>
</tr>
<tr>
<td>Rated insulation voltage Ue [V]</td>
<td></td>
<td>690</td>
</tr>
<tr>
<td>Rated impulse withstand voltage Uimp [kV]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated short-circuit breaking capacity [Icu]</td>
<td></td>
<td>3000A</td>
</tr>
<tr>
<td>Selectivity category</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utilization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated frequency [Hz]</td>
<td></td>
<td>50/60</td>
</tr>
<tr>
<td>Rated operational voltage Ue [V]</td>
<td></td>
<td>200 to 690V</td>
</tr>
<tr>
<td>Rated insulation voltage Ue [V]</td>
<td></td>
<td>690</td>
</tr>
<tr>
<td>Rated impulse withstand voltage Uimp [kV]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated short-circuit breaking capacity [Icu]</td>
<td></td>
<td>3000A</td>
</tr>
</tbody>
</table>

How to Order

- At time of your order, please specify your desired products as shown below.
  - A space should be inserted in the marked position.

<table>
<thead>
<tr>
<th>Model</th>
<th>Type name</th>
<th>Contact arrangement</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMP-T32</td>
<td>Auxiliary contact unit</td>
<td>UT-MAX ▲ 1a</td>
</tr>
<tr>
<td>MMP-T32BC</td>
<td>Alarm contact unit</td>
<td>UT-MAL ▲ 1b</td>
</tr>
<tr>
<td>MMP-T32LFLF</td>
<td>Short-circuit indicator unit</td>
<td>UT-TU</td>
</tr>
<tr>
<td>MMP-T32BCFLF</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How to Order the Options

- *1: MMP-T332BF type is based on the specification of wiring streamlining terminal.
- *2: UL-compliant rated working current is described on a different page 26-27.
- *3: MMP-T32LFLF is not applicable.

Applicable Standards

- International Standards
  - IEC60947-2, 60947-4-1
  - IEC60947-4-1A, CSA C22.2 No.60947-4-1+1
  - TUV approval CE CCC
- Domestic Standards in Japan
  - JIS C8201-2-1 Ann.1, 8201-4-1
  - Electric Applicable Safety Law (Electric articles other than specified) +1

45mm
Rated breaking capacities when using MMP-T32 in combination with a magnetic contactor are shown below:

### Type 1 Coordination (Non-Reversing/Reversing, Direct Start)

#### Combining Motor Circuit Breaker MMP-T32 and Magnetic Contactor S(D)-T

<table>
<thead>
<tr>
<th>Model Name</th>
<th>Heater Designation</th>
<th>Rated Current Setting Range [A]</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMP-T32</td>
<td>0.63</td>
<td>0.4 – 0.63</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>0.63 – 1</td>
</tr>
<tr>
<td></td>
<td>1.6</td>
<td>1 – 1.6</td>
</tr>
<tr>
<td></td>
<td>2.5</td>
<td>1.6 – 2.5</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>2.5 – 4</td>
</tr>
<tr>
<td></td>
<td>6.3</td>
<td>4 – 6.3</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>6.3 – 8</td>
</tr>
</tbody>
</table>

#### Magnetic Contactors (Non-Reversing/Reversing) Various

<table>
<thead>
<tr>
<th>Model Name</th>
<th>Connected Conductor Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UT-MQ12</td>
</tr>
</tbody>
</table>

Note 1. Unit model names of motor circuit breakers and magnetic contactors to be combined are as follows:

- S-T12 / T20: UT-MT20, S-T32: UT-MT32
- SD-T12 / T20: UT-MT20D + UT-BT20D, SD-T32: UT-MT32D + UT-BT32D
- S-T12 / T25: SD-T21 / SD-2 x T21 / SD-2 x T32: T12 / T25: Electric Wire Connection

Note 2. The above table shows those selected based on Mitsubishi standard 3-phase 4-pole motor SF-JR.
Working Environment

1. Ambient Temperature: -10°C ~ 40°C (applied outside control panel) Daily Average Temperature of Maximum 35°C, Yearly Average Temperature of Maximum 25°C
2. Maximum Temperature Inside Control Panel: 55°C (yearly average temperature inside panel of 40°C or below)
   * Please note that operation characteristics are affected by the ambient temperature.
3. Relative Humidity: 45% ~ 85% RH (no condensation, no freezing)
4. Altitude: 1000 m or below
5. Vibration: 10 Hz ~ 55 Hz; 19.6 m/s² or less
6. Shock: 49 m/s² or less
7. Atmosphere: Low levels of dust, smoke, corrosive gas, moisture or sodium.
   * When used in a sealed state for a long time, contact failure, etc., can occur.
   * Do not use the products in an atmosphere containing flammable gas.
8. Storage Temperature: -30°C ~ 65°C (no condensation, no freezing) Storage temperature refers to ambient temperature during transportation or storage of product. When starting use of the product, the temperature must be within the working temperature.
9. Precautions for Use: Set the position of the adjusting dial in consideration of the ambient temperature and the mounting conditions.
10. Connecting

<table>
<thead>
<tr>
<th>Model Name</th>
<th>MMP-T32</th>
<th>UT-MAX(UL), UT-MAL(UL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal Screw Size</td>
<td>M4</td>
<td>M3.5</td>
</tr>
<tr>
<td>Recommended Length of Insulation Layer to be Peeled Off When Wired with Bare Wire</td>
<td>10mm</td>
<td>8.5mm</td>
</tr>
<tr>
<td>Applicable Wire Size</td>
<td>Single Wire [mm]</td>
<td>φ 1.6, φ 2.6</td>
</tr>
<tr>
<td></td>
<td>Stranded Wire [phi]</td>
<td>1 ~ 6</td>
</tr>
<tr>
<td></td>
<td>UL Electrical Wire (60/75ºC, Copper Only)</td>
<td>#14 - #8</td>
</tr>
<tr>
<td>Crimp Lug Size</td>
<td>R1.25-4 - 8-4NS</td>
<td>0.5-3.7A - 2-83A</td>
</tr>
<tr>
<td>Terminal Screw Tightening Torque [N·m]</td>
<td>1.7</td>
<td>1.0</td>
</tr>
</tbody>
</table>

* For details about handling, temperature compensation, close mounting, etc., refer to the Operating Manual.

Operating Characteristic Curve

- **Operating Current Setting**
  - 2.5 A, 4 A, 3 A, 3.5 A
  - Adjustable Range
  - Non-Adjustable Range
  - Compensation Factor: X₁
  - ISET = I/XSET x 100
  - I: Motor Rated Current
  - XSET: Determined based on the following Figures 1 and 2
  - E.g.: If I = 2.8 A, Ambient Temperature = 40°C, and close mounted
    - ISET = 2.8/(90-5) x 100 = 3.3 A
    - Set the adjusting dial to position 3.3 A.

- **Operating Time (s)**
- **Multiple of Rated Current (%)**
- **Relative Humidity**
  - 45% ~ 85% RH

- **Three-Phase Cold Start**
  - Instant tripping properties are 1,040% - 1,560% of the maximum current setting.

- **Three-Phase Hot Start**
  - Operating characteristics are affected by the ambient temperature.

**Application to Single-Phase Motors**
Select an appropriate heater designation upon confirmation of the full-load current.
As Motor Circuit Breakers have an open-phase protection function, single-phase motors should be connected as in the figure at right.
For combination model names, please refer to the outline drawings on page 19.

### List of Options

<table>
<thead>
<tr>
<th>Number</th>
<th>Product name</th>
<th>Model</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Auxiliary contact unit (to be internally installed)</td>
<td>UT-MAX</td>
<td>1a</td>
<td>The contacts of this unit operate in unison with the turning ON/OFF of the main unit.</td>
</tr>
<tr>
<td>2</td>
<td>Alarm contact unit (to be internally installed)</td>
<td>UT-MAL</td>
<td>1a</td>
<td>The contacts of this unit operate together short-circuits, overloads, open-phase</td>
</tr>
<tr>
<td>3</td>
<td>3 phase feeding terminal</td>
<td>UT-EP3</td>
<td>✔</td>
<td>This is a terminal block unit that can enable the wiring of bare wire (single core wire) without using the power supply side if the unit is connected in parallel with the bus bar.</td>
</tr>
<tr>
<td>4</td>
<td>Bus bar</td>
<td>UT-2B4</td>
<td>✔</td>
<td>A unit that can supply power (parallel connection) to 2 or 3 units individually without use of electric wire.</td>
</tr>
<tr>
<td>5</td>
<td>Line side terminal adapter</td>
<td>UT-CV3</td>
<td>✔</td>
<td>Power supply side terminal cover to respond to UL0947-4-1A, Type EF. This kit consists of terminal adapter, terminal cover and 3 screws.</td>
</tr>
<tr>
<td>6</td>
<td>Short-circuit indicator unit</td>
<td>UT-TU</td>
<td>✔</td>
<td>This unit has a sensor that the red indication is lit when the device is tripped due to short-circuit.</td>
</tr>
<tr>
<td>7</td>
<td>Connection conductor unit</td>
<td>UT-MT32</td>
<td>✔</td>
<td>A unit to connect and link the MMP-T32 and Magnetic Contactor electrically and mechanically. Necessary for application to UL0947-4-1A, Type F.</td>
</tr>
<tr>
<td>8</td>
<td>Mounting base unit</td>
<td>UT-RT20</td>
<td>✔</td>
<td>A plate to install the combination starter with MMP-T32 and Magnetic Contactor combined. Rail mounting and screw mounting are available.</td>
</tr>
<tr>
<td>9</td>
<td>Jointing block unit</td>
<td>UT-RT10</td>
<td>✔</td>
<td>A set of the blocks for mechanically connecting two mounting base units. Necessary for combination of MMP-T32 with reversible magnetic contactor.</td>
</tr>
</tbody>
</table>

For combination model names, please refer to the outline drawings on page 19.

### Specifications of Power Supply Block and Bus Bar

<table>
<thead>
<tr>
<th>Model Name</th>
<th>Contact Arrangement</th>
<th>Rated Voltage</th>
<th>Durability</th>
<th>Minimum Applicable Load</th>
<th>Rated Current</th>
<th>Applicable Electrical Wire</th>
</tr>
</thead>
<tbody>
<tr>
<td>UT-EP3</td>
<td></td>
<td>63</td>
<td>50</td>
<td>1 x R1.25/4...8.4NS</td>
<td></td>
<td>(Cannot be wired with crimp lug)</td>
</tr>
<tr>
<td>UT-2B4/3B4/2B5/3B5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 x 6...16 mm²</td>
</tr>
</tbody>
</table>

### Parallel Connection Using Bus Bar Unit

- When connecting more than four MMP-T32 Motor Circuit Breakers in parallel, connect them alternately reversing multiple UT-2B5 Bus Bar Units.
- Meet the following requirements in limiting the number of units when connecting in parallel.
- Application Example: For Connecting 4 Units in Parallel (Close Mounting)

**Bus Bar Units to be Used**

- UT-2B5

**Connection Example** *Determine the arrangement of the bus bar unit according to the feed position.*

**Specifications of Auxiliary Contact Unit and Alarm Contact Unit**

<table>
<thead>
<tr>
<th>Model Name</th>
<th>Contact Arrangement</th>
<th>Rated Voltage</th>
<th>Durability</th>
<th>Minimum Applicable Load</th>
<th>Rated Current</th>
<th>Applicable Electrical Wire</th>
</tr>
</thead>
<tbody>
<tr>
<td>UT-MAX(ALKLL)</td>
<td></td>
<td>250V</td>
<td></td>
<td>0.03/0.025</td>
<td>5</td>
<td>0.24</td>
</tr>
<tr>
<td>UT-MAT(ALKLL)</td>
<td></td>
<td>125V</td>
<td></td>
<td>0.03/0.025</td>
<td>0.1</td>
<td>0.03</td>
</tr>
</tbody>
</table>

### Option combination Diagram

- Visual representations of various optional units and their combinations are shown in a diagram format.
The above figure shows the state where 2 units [UT-MAX(LL) and/or UT-MAL(LL)] are installed. External dimensions of UT-MAX(LL) and UT-MAL(LL) are equivalent.
### List of Combination Models

<table>
<thead>
<tr>
<th>Model Name</th>
<th>Mounting Base Unit</th>
<th>Mounting Method</th>
<th>Mounting Block Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-T10 (Non-Reversing)</td>
<td>UT-RT20</td>
<td>Configurable without the base unit if screw mounting is not required</td>
<td>DIN Rail (1 pc)</td>
</tr>
<tr>
<td>S-T12/20 (Non-Reversing)</td>
<td>UT-RT20</td>
<td>DIN Rail (1 pc)</td>
<td>–</td>
</tr>
<tr>
<td>S-T16 (Non-Reversing)</td>
<td>UT-RT20</td>
<td>DIN Rail (1 pc)</td>
<td>–</td>
</tr>
<tr>
<td>S-T18 (Non-Reversing)</td>
<td>UT-RT20</td>
<td>DIN Rail (1 pc)</td>
<td>–</td>
</tr>
<tr>
<td>S-2XT10 (Reversing)</td>
<td>UT-BT32</td>
<td>Screw Mounting or DIN Rail (2 pcs)</td>
<td>UT-RT10</td>
</tr>
<tr>
<td>S-2XT12/20 (Reversing)</td>
<td>UT-BT32</td>
<td>Screw Mounting or DIN Rail (2 pcs)</td>
<td>UT-RT20</td>
</tr>
<tr>
<td>S-2XT32 (Reversing)</td>
<td>UT-BT32</td>
<td>Screw Mounting or DIN Rail (2 pcs)</td>
<td>UT-RT32</td>
</tr>
<tr>
<td>SD-Q11/Q12 (Non-Reversing)</td>
<td>UT-MQ12</td>
<td>No Applicable Base Unit Available (Screw Mounting Not Possible)</td>
<td>DIN Rail (1 pc)</td>
</tr>
<tr>
<td>SD-QR11/QR12 (Reversing)</td>
<td>UT-MQ12</td>
<td>DIN Rail (1 pc)</td>
<td>Not Required</td>
</tr>
<tr>
<td>SD-T12/20 (Non-Reversing)</td>
<td>UT-RT20</td>
<td>Screw Mounting or DIN Rail (2 pcs)</td>
<td>–</td>
</tr>
<tr>
<td>SD-T32 (Non-Reversing)</td>
<td>UT-RT20</td>
<td>Screw Mounting or DIN Rail (2 pcs)</td>
<td>–</td>
</tr>
<tr>
<td>SD-2XT12/20 (Reversing)</td>
<td>UT-BT32</td>
<td>Screw Mounting or DIN Rail (2 pcs)</td>
<td>UT-RT20</td>
</tr>
<tr>
<td>SD-2XT32 (Reversing)</td>
<td>UT-BT32</td>
<td>Screw Mounting or DIN Rail (2 pcs)</td>
<td>UT-RT32</td>
</tr>
</tbody>
</table>

### Outline Drawing

#### MMP-T32 + UT-MT□ + UT-BT□ + S-2×T□ + UT-RT□ + UT-SD□

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Combination Contact</th>
<th>Combination Contactor Contact Unit</th>
<th>Combination Mounting Base Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
</tr>
<tr>
<td>UT-RT20</td>
<td>91</td>
<td>46</td>
<td>116</td>
</tr>
<tr>
<td>UT-RT20</td>
<td>99</td>
<td>94</td>
<td>116</td>
</tr>
<tr>
<td>UT-RT32</td>
<td>98</td>
<td>94</td>
<td>116</td>
</tr>
</tbody>
</table>

#### MMP-T32 + UT-MQ12 + SD-Q□

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Combination Contact</th>
<th>Combination Contactor Contact Unit</th>
<th>Combination Mounting Base Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
</tr>
<tr>
<td>UT-MQ12</td>
<td>93</td>
<td>14</td>
<td>50</td>
</tr>
<tr>
<td>UT-MQ12</td>
<td>93</td>
<td>14</td>
<td>50</td>
</tr>
<tr>
<td>UT-MQ12</td>
<td>93</td>
<td>14</td>
<td>50</td>
</tr>
</tbody>
</table>
Mitsubishi Motor Circuit Breakers feature: (2) disconnection; (4) motor control; and (5) overload protection. The circuit should be as shown in the diagram below.

Basic Circuit Configurations Provided by NEC (National Electric Code) and Motor Circuit Breaker Applications

Motor Circuit Breakers allow you to reduce the quantity of equipment required to meet the basic circuit configurations provided by the NEC and to improve SCCR.

[Diagram of Basic Circuit Configurations]

Motor Circuit Breaker Rating

| UL Standard and SCCR |

Motor Circuit Breaker Rating

| [Certified Rating] |

**Main Circuit Single Phase**

<table>
<thead>
<tr>
<th>Motor Circuit Breaker (Current Setting Range)</th>
<th>110-120V</th>
<th>200V</th>
<th>208-240V</th>
<th>220-240V</th>
<th>440-480V</th>
<th>550-600V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note 1. Since “&lt;” has no horsepower setting by standard, select the maximum rated operating current [A].</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Main Circuit Three Phase**

<table>
<thead>
<tr>
<th>Motor Circuit Breaker (Current Setting Range)</th>
<th>110-120V</th>
<th>200V</th>
<th>208-240V</th>
<th>220-240V</th>
<th>440-480V</th>
<th>550-600V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note 1. Since “&lt;” has no horsepower setting by standard, select the maximum rated operating current [A].</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note 1. Since “<” has no horsepower setting by standard, select the maximum rated operating current [A].

---

**Application of the Motor Circuit Breaker to circuits allows for:**
- (2) disconnection;
- (4) motor control; and
- (5) overload protection—all with one unit. It thus allows reduction of the number of devices in the panel and saving of panel space.

---

### Motor Circuit Breaker Rating

- **Main Circuit Single Phase**
- **Main Circuit Three Phase**

---

### UL Standard and SCCR

---

### Basic Circuit Configurations Provided by NEC (National Electric Code) and Motor Circuit Breaker Applications

Section 430 of the NEC (National Electric Code) requires that the basic circuit configuration of the electric motor protection circuit should be as shown in the diagram below.

Mitsubishi Motor Circuit Breakers feature: (2) disconnection; (4) motor control; and (5) overload protection—all with one unit. It is certified as Type E in combination with a specific optional unit, as well as Type F in combination with a magnetic contactor, and is also applicable for (3) branch circuit protection in addition to (2), (4), and (5).

Mitsubishi Motor Circuit Breakers allow you to reduce the quantity of equipment required to meet the basic circuit configuration for the motor protection circuit provided by the NEC and to improve SCCR.

---

### Motor Circuit Breaker Rating

- **Main Circuit Single Phase**
- **Main Circuit Three Phase**

---

### UL Standard and SCCR

---

### Basic Circuit Configurations Provided by NEC (National Electric Code) and Motor Circuit Breaker Applications

Section 430 of the NEC (National Electric Code) requires that the basic circuit configuration of the electric motor protection circuit should be as shown in the diagram below.

Mitsubishi Motor Circuit Breakers feature: (2) disconnection; (4) motor control; and (5) overload protection—all with one unit. It is certified as Type E in combination with a specific optional unit, as well as Type F in combination with a magnetic contactor, and is also applicable for (3) branch circuit protection in addition to (2), (4), and (5).

Mitsubishi Motor Circuit Breakers allow you to reduce the quantity of equipment required to meet the basic circuit configuration for the motor protection circuit provided by the NEC and to improve SCCR.
Type E/F Selection Table

<table>
<thead>
<tr>
<th>(1) Certified Rating</th>
<th>Combination</th>
<th>Motor Circuit Breaker</th>
<th>Power Side Terminal Cover</th>
<th>Short-circuit Display Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>◆ Main Circuit Three Phase 220-240V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[Certified Rating]</td>
<td>Arrangement</td>
<td>ＭＭＰ-T３２</td>
<td>ＭＭＰ-T３２</td>
<td>ＭＭＰ-T３２</td>
</tr>
<tr>
<td>◆ Main Circuit Three Phase 440-480V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[Certified Rating]</td>
<td>Arrangement</td>
<td>ＭＭＰ-T３２</td>
<td>ＭＭＰ-T３２</td>
<td>ＭＭＰ-T３２</td>
</tr>
</tbody>
</table>

Note 1. Since "-" has no horsepower setting by standard, select the maximum rated operating current [A].

About Warranty

Before purchasing and using our products, please confirm the following product warranty.

Warranty period (The warranty period for our products shall be one year after purchase or delivery to the designated location. However, the maximum warranty period shall be 18 months after production, in consideration that the maximum length of distribution period is to be 6 months after shipping. This warranty period may not apply in the case where the use environment or use conditions specifically impact the life of the product.)

Scope of warranty

(1) When any failure occurs during the above warranty period which is clearly our responsibility, we will replace or repair the failed portion of the product free of charge at the location of purchase or delivery. Note that the "failure" mentioned here shall not include such items as scratches and disconnection which do not affect performance.

(2) In the following cases, even during the warranty period, charged repair services shall be applied.

- Failures caused by inappropriate conditions, environment, handling, and uses other than those specified in catalogs, instruction manuals or specifications.
- Failures caused by inappropriate installation.
- Failures caused by the design of the customer's equipment or software.
- Failures caused by the customer tampering with our products such as rewiring without our authorization.
- Failures caused by uses of the product other than ordinarily intended.
- Failures caused by force majeure such as fire and abnormal voltage accidents, and natural disasters such as earthquakes, wind and flood.
- Failures caused by reasons that were unforeseeable by the level of technology at the time of shipment.
- The warranty that is mentioned here shall mean warranty of the unit of delivery, and any losses induced by the failures of delivered products shall be excluded from our warranty.

Failure diagnosis

In principle, primary failure diagnosis shall be conducted by the customer. However, this job, if requested by the customer, can be performed by us or our service company with charge. In this case, a service fee shall be charged to the customer in accordance with our price list.

Exemption from warranty related to opportunity or secondary losses.

Regardless if in or out of warranty period, loss of opportunity and lost earnings at the customer side caused by the failures of our products, any damages caused by special situation regardless of our foreseeability, secondary losses, accident compensation, damages on anything other than our products, compensation to other jobs, and damages caused by any reasons for which we are not held responsible, shall be outside the scope of our compensation.

Applicable areas of our products

(1) The contents of products shown in this catalog are for your selection of models. When you actually use the product, read the "Instruction Manual" carefully beforehand and use correctly. Please note that the external view or specifications that should not affect the model selection can change without preannouncement.

(2) When using a product listed in this catalog, you are required to accept that your use should not lead to any serious accident if by any chance the product develops any failures or errors, and, in the event any failure or error occurs, backup or fail-safe functions are in place outside the device by the system.

(3) The products described in this catalog are designed and manufactured as general products to be used for general industrial fields. For this reason, the products described in this catalog should not be used for the applications requiring special quality assurance systems, such as serious public uses as atomic power plants and other power plants owned by power companies, railway applications and government and public office applications.

Note, however, that the products shall be applicable to such uses if the use is limited and the customer agrees not to require special high quality. Furthermore, when the customer is investigating application for the uses where serious impact is foreseen to the human body and assets and therefore high reliability for security and control system is required, such as aviation, medical services, railways, combustion and fuel equipment, manned transportation equipment, entertainment facilities and security machines, please contact our representatives and discuss any necessary agreement or specifications.

Supply period of spare goods after production stop

(1) For our Motor circuit breakers, no repairs or supply of spare parts are provided by us.

(2) For the discontinuation of production, we will announce in such media as "Sales and Service" paper created by us.

Recommendation for renewal due to life

Our Motor circuit breakers with contacts and mechanical parts have certain wear life in line with the number of open/close operations, while our mold components, coil wires, electronic parts and grease have aging degradation life influenced by the use environment and use conditions.

Regarding the use of our Motor circuit breakers, we recommend customers to renew the products every 15 years as a rule, provided that the products are used in line with the number of open/close operations specified by this catalog or the instruction manual or under the standard use conditions of Molded Case Circuit Breakers and Earth-Leakage Circuit Breakers as mentioned by "The Report on Recommended Renewal Timing for Low Voltage Devices" issued by Japan Electrical Manufacturers’ Association (JEMA).

Warranty period and scope of warranty

(1) Warranty period for our products shall be one year after purchase or delivery to the designated location. However, the maximum warranty period shall be 18 months after production, in consideration that the maximum length of distribution period is to be 6 months after shipping.

(2) This warranty period may not apply in the case where the use environment or use conditions specifically impact the life of the product.

Period and scope of warranty

Exemption from warranty related to opportunity or secondary losses.

Regardless if in or out of warranty period, loss of opportunity and lost earnings at the customer side caused by the failures of our products, any damages caused by special situation regardless of our foreseeability, secondary losses, accident compensation, damages on anything other than our products, compensation to other jobs, and damages caused by any reasons for which we are not held responsible, shall be outside the scope of our compensation.

Applicable areas of our products

(1) The contents of products shown in this catalog are for your selection of models. When you actually use the product, read the "Instruction Manual" carefully beforehand and use correctly. Please note that the external view or specifications that should not affect the model selection can change without preannouncement.

(2) When using a product listed in this catalog, you are required to accept that your use should not lead to any serious accident if by any chance the product develops any failures or errors, and, in the event any failure or error occurs, backup or fail-safe functions are in place outside the device by the system.

(3) The products described in this catalog are designed and manufactured as general products to be used for general industrial fields. For this reason, the products described in this catalog should not be used for the applications requiring special quality assurance systems, such as serious public uses as atomic power plants and other power plants owned by power companies, railway applications and government and public office applications.

Note, however, that the products shall be applicable to such uses if the use is limited and the customer agrees not to require special high quality. Furthermore, when the customer is investigating application for the uses where serious impact is foreseen to the human body and assets and therefore high reliability for security and control system is required, such as aviation, medical services, railways, combustion and fuel equipment, manned transportation equipment, entertainment facilities and security machines, please contact our representatives and discuss any necessary agreement or specifications.

Supply period of spare goods after production stop

(1) For our Motor circuit breakers, no repairs or supply of spare parts are provided by us.

(2) For the discontinuation of production, we will announce in such media as "Sales and Service" paper created by us.

Recommendation for renewal due to life

Our Motor circuit breakers with contacts and mechanical parts have certain wear life in line with the number of open/close operations, while our mold components, coil wires, electronic parts and grease have aging degradation life influenced by the use environment and use conditions.

Regarding the use of our Motor circuit breakers, we recommend customers to renew the products every 15 years as a rule, provided that the products are used in line with the number of open/close operations specified by this catalog or the instruction manual or under the standard use conditions of Molded Case Circuit Breakers and Earth-Leakage Circuit Breakers as mentioned by "The Report on Recommended Renewal Timing for Low Voltage Devices" issued by Japan Electrical Manufacturers’ Association (JEMA).
Information of Our FA-related Products

Magnetic Starter | MS-T Series

- Exceed your expectations.
  - 104A frame model is over 16% smaller with a width of just 36mm!
  - Reduce your coil inventory by up to 50%.
  - Be certified to the highest international levels while work is ongoing to gain other country.

Inverter FR-A800 Series

- Low Voltage Circuit Breakers Mitsubishi WS-V Series Molded Case Circuit Breakers, Earth Leakage Circuit Breakers
- Magnetic Starter MS-T Series
- Inverter FR-A800 Series

---

**Product Specifications**

- **Frame**: 10-16-32 A
- **Applicable standards**: Certification to various standards including IEC, UL, CEC, UL, TUV, CCC.
- **Technical cover**: Standard terminal cover improves safety, simplifies ordering, and reduces inventory, etc.
- **Unipolar setting**: Wiring and operability are improved with standardizing wiring terminal cover specifications.
- **Operation coil rating**: Max. range of operation coil rating reduces number of coil types from 15 to 6 types and simplifies selection.
- **Option series**: Device lineup includes Auxiliary Contact Block, Operation Coil Surge Absorber Unit, Mechanical Interlock Unit.

---

**Product Specifications**

- **Input power supply voltage**: 100-240VAC
- **Applicable software**: Built-in interface supports various applications including GT Works3, CC-Link, RS-232/485, Ethernet, USB, SD card
- **Touch panel type**: Multi-touch features, two-point press, and scroll operations for more user-friendliness.

---

**Related Products**

- **PLC**: MELSEC iQ-R Series
  - Revolutionary, next generation controllers building a new era in automation
  - High-speed, high-accuracy multiple CPU control system based on the iQ Platform
  - New high-speed system bus and inter-module sync realizes improved productivity and reduced TCO
  - Reducing development costs through intuitive engineering (GX Works3)
  - Robust security features (such as security key authentication, IP filter)

- **HMI**: Graphic Operation Terminal GT2000 Series GT27 Model
  - To the top of HMIs with further user-friendly, satisfactory standard features.
  - Comfortable screen operation even if high-load processing (e.g. logging, device data transfer) is running. (Monitoring performance is twice faster than GT16)
  - Actual usable space without using a SD card is expanded to 128MB for more flexible screen design.

- **AC Servo**: Mitsubishi General-Purpose AC Servo MELSERVO-J4 Series
  - Industry-leading level of high performance servo
  - Industry-leading level of basic performance: Speed response (2.5kHz), 4,000,000 (4,194,304p/rev) encoder
  - Advanced one-touch tuning function achieves the one-touch adjustment of advanced vibration suppression control, etc.
  - Equipped with large capacity drive recorder and machine diagnosis function for easy maintenance.
  - 2-axis and 3-axis servo amplifiers are available for energy-conserving, space-saving, and low-cost machines.

---

**Related Products**

- **MOTOR CIRCUIT BREAKERS**
  - Exceeds your expectations.
  - A 104A frame model is over 16% smaller with a width of just 36mm!
  - Reduce your coil inventory by up to 50%.
  - Be certified to the highest international levels while work is ongoing to gain other country.

---

**MOTOR CIRCUIT BREAKERS**

- **Low Voltage Circuit Breakers Mitsubishi WS-V Series Molded Case Circuit Breakers, Earth Leakage Circuit Breakers**
- **Magnetic Starter MS-T Series**
- **Inverter FR-A800 Series**
- **Product Specifications**
  - **Frame**: 30-200A Frame
  - **Applicable standard**: Applicable to IEC, GB, UL, CEC, JIS, etc.
  - **Expansion of UL listed product line-up**: New lineup of 600VAC type with high breaking performance for SCOR requirement
  - **Commoditization of internal accessories**: Reduction of internal accessory types from 3 to 1
  - **Improvement of breaking performance**: New breaking technology "Expanded ISTAC"
  - **New electronic circuit breakers can display various measurement items.**
  - **Commoditization for AC and DC circuit use**
  - **Robust security features (such as security key authentication, IP filter)**

---

**Product Specifications**

- **Input power supply voltage**: 200V class: 0.4kW to 90kW, 400V class: 0.4kW to 500kW
- **Command interface**: Multi-touch features, two-point press, and scroll operations for more user-friendliness.
- **Resolution**: Actual usable space without using a SD card is expanded to 128MB for more flexible screen design.

---

**Product Specifications**

- **Input power supply voltage**: 1-phase/3-phase 200V AC, 1-phase 100V AC, 3-phase 400V AC, 48V DC/24V DC/H, SSCNET, −15 ጭ (compatible in J3 compatibility mode), CC-Link IE Field Network, RS-485/422, Ethernet, USB, SD card
- **Control system architecture**: Rack-mounted modular based system
- **Available modules**: 0.98 µs
- **Thrust**: 50 to 3000N), direct drive motor (rated torque: 2 to 240N•m)
- **Conforms to Category 4 PL e, SIL 3 by a combination with MR-D30 functional safety unit**
- **Conforms to functions of IEC/EN 61800-5-2, STO: Category 3 PL d, SIL 2**
- **Advanced one-touch tuning, advanced vibration suppression control**
- **Network interface with Motion, pulse train, analog**