

ELECTRONIC MOLDED CASE CIRCUIT BREAKER



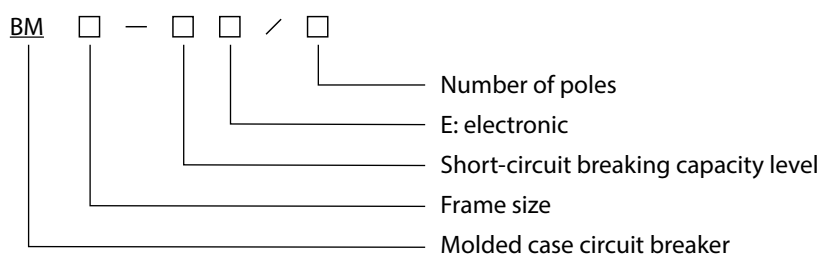
I . Product Description

- Standard: IEC/EN 60947-2 & CE Marked
- Rated current: 40~1250A
- Frequency: 50/60Hz
- Rated insulation voltage $U_i(V)$: 690V
- Rated operation voltage $U_e(V)$: 400V
- Function :
 - + Long-time delay over-current protection
 - + Short-time delay over-current protection
 - + Short-circuit current protection
- Flexible adjustable: Tripping time, current
- Remote control via communication module

II . Operation Condition

- Ambient temperature: -5 ~+40
- Altitude limit: Below 2,000M
- Humidity: Max. 90%
- Pollution: Grade 3.
- Installation category (over-voltage category):
 - Category III for the circuit breaker
 - Category II for other auxiliary circuits and control circuits

III. Catalogue designation



IV. Selection Instruction

| Frame size (Inm) | Level code | Rated ultimate short circuit breaking capacity Icu (kA) | | | | | | Poles (P) | Rated current In (A) | Overload long-time delay current setting value Ir (A) | Accessories | | Option code |
|------------------|------------|---|------|------------|------|------|------|-----------|----------------------|---|-------------|----------------------|---|
| | | GB14048.2 | | IEC60947-2 | | | | | | | Code | Description | |
| | | 230V | 440V | 220V | 380V | 440V | 500V | | | | | | |
| 100 | HE | 85 | 50 | 85 | 50 | 42 | 25 | 3, 4 | 100 | 40, 45, 50, 60, 70, 80, 90, 95, 100 | blank | N/A | |
| | RE | 100 | 70 | 100 | 70 | 55 | 42 | 3, 4 | | | | | |
| | UE | 125 | 85 | 125 | 85 | 85 | 65 | 3, 4 | | | AX | Auxiliary switch | |
| 160 | HE | 85 | 50 | 85 | 50 | 42 | 25 | 3, 4 | 160 | 64, 72, 80, 96, 112, 128, 144, 152, 160 | AL | Alarm switch | C: communication function available Blank: N/A |
| | RE | 100 | 70 | 100 | 70 | 55 | 42 | 3, 4 | | | SHT | Shunt trip | |
| | UE | 125 | 85 | 125 | 85 | 85 | 65 | 3, 4 | | | UVT | Under-voltage trip | |
| 250 | HE | 85 | 50 | 85 | 50 | 42 | 25 | 3, 4 | 250 | 100, 113, 125, 150, 175, 200, 225, 238, 250 | COM | Communication module | |
| | RE | 100 | 70 | 100 | 70 | 55 | 42 | 3, 4 | | | HUB | Communication hub | |
| | UE | 125 | 85 | 125 | 85 | 85 | 65 | 3, 4 | | | | | |
| 400 | HE | 85 | 50 | 85 | 50 | 42 | 25 | 3, 4 | 400 | 160, 180, 200, 240, 280, 320, 360, 380, 400 | | | |
| | RE | 100 | 70 | 100 | 70 | 55 | 42 | 3, 4 | | | | | |
| | UE | 125 | 85 | 125 | 85 | 85 | 65 | 3, 4 | | | | | |
| 630 | HE | 85 | 50 | 85 | 50 | 50 | 25 | 3, 4 | 630 | 252, 284, 315, 378, 441, 504, 567, 600, 630 | | | |
| | RE | 100 | 70 | 100 | 70 | 70 | 42 | 3, 4 | | | | | |
| | UE | 125 | 85 | 125 | 100 | 85 | 65 | 3, 4 | | | | | |
| 800 | SE | 85 | 50 | 85 | 50 | 50 | 25 | 3, 4 | 800 | 320, 360, 400, 480, 560, 640, 720, 760, 800 | | | |
| | HE | 100 | 70 | 100 | 70 | 70 | 42 | 3, 4 | | | | | |
| | RE | 125 | 85 | 125 | 100 | 85 | 65 | 3, 4 | | | | | |
| 1000 | SE | 100 | 70 | 100 | 70 | 70 | 50 | 3 | 1000 | 400, 450, 500, 600, 700, 800, 900, 950, 1000 | | | |
| | HE | 125 | 85 | 125 | 100 | 85 | 65 | 3 | | | | | |
| 1250 | SE | 100 | 70 | 100 | 70 | 70 | 50 | 3 | 1250 | 500, 563, 625, 750, 875, 1000, 1125, 1188, 1250 | | | |
| | HE | 125 | 85 | 125 | 100 | 85 | 65 | 3 | | | | | |

Note:

1. Frame size 100/160/250: UVT not available
2. 1000-SE/HE, 1250-SE/HE UVT & SHT not available
3. Frame size 1000/1250: communication function not available
4. The accessories COM, HUB are not applied to the circuit breaker with no communication function
5. Frame size 100/160/250: When the MCCB quips with communication function, there will be no accessories can be installed, such as AX, UVT, SHT and AL
6. One communication HUB can be applied to Maximum 4 or 5 communication modules

V. Protection Setting and Characteristics

1. Long-time delay over-current protection

| Current setting $I_r = 0.4/0.45/0.5/0.6/0.7/0.8/0.9/0.95/1.0 \times I_n$ | | | | | | |
|--|---------------------------------|----|----|----|----|-----|
| Current | Tripping time requirement | | | | | |
| 1.05 I_r | No tripping within 2hr | | | | | |
| 1.3 I_r | Tripping within 2hr | | | | | |
| 2 I_r | Tripping time setting T_r (s) | 20 | 40 | 60 | 80 | 160 |

- ★ The current value tolerance is $\pm 10\%$; tripping time tolerance is $\pm 20\%$.
- ★ Please specify, when place the order of 4P circuit breaker with neutral protection and setting at $0.5I_r$ or $1.0I_r$.
- ★ This function cannot be "off"

2. Short-time delay over-current protection

| Current setting $I_s = 2/3/4/5/6/7/8/10 \times I_r$ | | | | | | |
|---|---------------------------|---------------------------------|-----|-----|-----|-----|
| Current | Tripping time requirement | | | | | |
| $I_s \leq I \leq 8I_r$ | Inverse-time | Inverse time curve | | | | |
| $I > 8I_r$ | | Tripping time setting T_s (s) | 0.1 | 0.2 | 0.3 | 0.4 |
| $I \geq I_s$ | Definite-time | Tripping time setting T_s (s) | 0.1 | 0.2 | 0.3 | 0.4 |

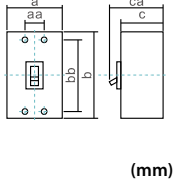
- ★ The current value tolerance is $\pm 15\%$; tripping time tolerance is $\pm 20\%$ ($T_s = 0.1 \pm 0.03s$)
- ★ BM100-E, BM160-E and BM250-E do not provide with the short-time delay over-current protection characteristic.
- ★ This function can be "off"

3. Short-circuit current protection (instantaneous characteristic)

| Current setting $I_i = 1.5/2/4/6/8/10/11 \times I_n$ | |
|--|---------------------------|
| Current | Tripping time requirement |
| $I \leq 0.80I_i$ | No tripping within 0.2s |
| $I \geq 1.2I_i$ | Tripping within 0.2s |

- ★ The current value tolerance is $\pm 15\%$
- ★ This function cannot be "off"

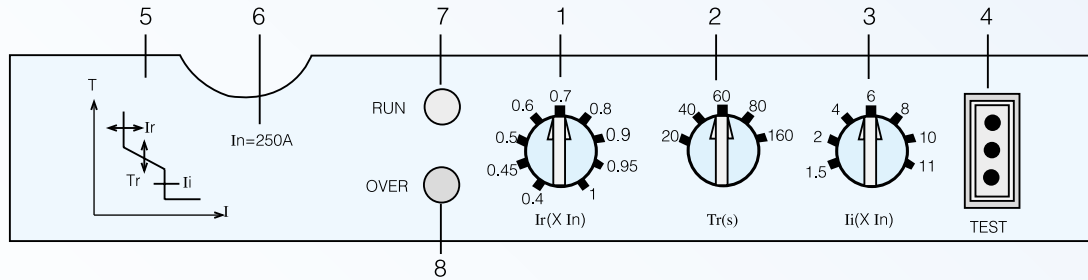
IV. Selection Instruction

| Frame size (AF) (Inm) | | | 100 | | | 160 | | | 250 | | |
|--|--|----|--------------------------------------|----------|----------|--|----------|----------|--|----------|----------|
| Type | | | BM100-HE | BM100-RE | BM100-UE | BM160-HE | BM160-RE | BM160-UE | BM250-HE | BM250-RE | BM250-UE |
| Rated current In (A) at ambient temp. 40°C | | | 100 | | | 160 | | | 250 | | |
| Adjustable current Ir (A) | | | 40, 45, 50, 60, 70, 80, 90, 95, 100. | | | 64, 72, 80, 96, 112, 128, 144, 152, 160. | | | 100, 113, 125, 150, 175, 200, 225, 238, 250. | | |
| Rated operation voltage Ue (V) | | | 400 | | | 400 | | | 400 | | |
| Rated insulation voltage Ui (V) | | | 690 | | | 690 | | | 690 | | |
| Rated impulse withstand voltage Uimp (kV) | | | 8 | | | 8 | | | 8 | | |
| Number of poles (P) | | | 3P / 4P | | | 3P / 4P | | | 3P / 4P | | |
| Model | | | HE | RE | UE | HE | RE | UE | HE | RE | UE |
| Rated breaking capacity Icu (kA) | | | 50 | 70 | 85 | 50 | 70 | 85 | 50 | 70 | 85 |
| Dimensions (mm) |  (mm) | a | 105 / 140 | | | 105 / 140 | | | 105 / 140 | | |
| | | b | 165 | | | 165 | | | 165 | | |
| | | c | 86 | | | 86 | | | 86 | | |
| | | ca | 112 | | | 112 | | | 112 | | |
| | | bb | 126 | | | 126 | | | 126 | | |
| | | aa | 35 | | | 35 | | | 35 | | |
| Weight (kg) | | | 2.5 / 3.0 | | | 2.5 / 3.0 | | | 2.5 / 3.0 | | |
| Endurance | Electrical life (10 thousand) | | 1,000 | | | 1,000 | | | 1,000 | | |
| | Mechanical life (10 thousand) | | 8,500 | | | 7,000 | | | 7,000 | | |
| Connection | | | Clamp terminal | | | Clamp terminal | | | Clamp terminal | | |
| Trip unit | | | Electronic | | | Electronic | | | Electronic | | |
| Trip button | | | Equipped | | | Equipped | | | Equipped | | |
| Category | | | A | | | A | | | A | | |
| Optional accessories | Alarm switch (AL) | | ○ | | | ○ | | | ○ | | |
| | Auxiliary switch (AX) | | ○ | | | ○ | | | ○ | | |
| | Shunt trip (SHT) | | ○ | | | ○ | | | ○ | | |
| | Under-voltage trip (UVT) | | — | | | — | | | — | | |
| | Lead wiring terminal (LT) | | ○ | | | ○ | | | ○ | | |
| | Motor operation device | | ○ | | | ○ | | | ○ | | |
| | Communication (COM) | | ○ | | | ○ | | | ○ | | |
| | Communication (HUB) | | ○ | | | ○ | | | ○ | | |

| 400 | | | 630 | | | 800 | | | 1000 | | 1250 | |
|--|----------|----------|--|----------|----------|--|----------|----------|---|-----------|--|-----------|
| BM400-HE | BM400-RE | BM400-UE | BM630-HE | BM630-RE | BM630-UE | BM800-SE | BM800-HE | BM800-RE | BM1000-SE | BM1000-HE | BM1250-SE | BM1250-HE |
| 400 | | | 630 | | | 800 | | | 1000 | | 1250 | |
| 160, 180, 200, 240, 280, 320, 360, 380, 400. | | | 252, 284, 315, 378, 441, 504, 567, 600, 630. | | | 320, 360, 400, 480, 560, 640, 720, 760, 800. | | | 400, 450, 500, 600, 700, 800, 900, 950, 1000. | | 500, 563, 625, 750, 875, 1000, 1125, 1188, 1250. | |
| 400 | | | 400 | | | 400 | | | 400 | | 400 | |
| 690 | | | 690 | | | 690 | | | 690 | | 690 | |
| 8 | | | 8 | | | 8 | | | 8 | | 8 | |
| 3P / 4P | | | 3P / 4P | | | 3P / 4P | | | 3P | | 3P | |
| HE | RE | UE | HE | RE | UE | SE | HE | RE | SE | HE | SE | HE |
| 50 | 70 | 85 | 50 | 70 | 85 | 50 | 70 | 85 | 70 | 85 | 70 | 85 |
| 140 / 185 | | | 210 / 280 | | | 210 / 280 | | | 210 | | 210 | |
| 257 | | | 275 | | | 275 | | | 406 | | 406 | |
| 103 | | | 103 | | | 103 | | | 140 | | 140 | |
| 144 | | | 155 | | | 155 | | | 190 | | 190 | |
| 194 | | | 243 | | | 243 | | | 375 | | 375 | |
| 44 | | | 70 | | | 70 | | | 70 | | 70 | |
| 7 / 8 | | | 11.5 / 14.5 | | | 11.5 / 14.5 | | | 26 | | 26 | |
| 1,000 | | | 1,000 | | | 500 | | | 500 | | 500 | |
| 4,000 | | | 4,000 | | | 2,500 | | | 2,500 | | 2,500 | |
| Busbar | | | Busbar | | | Busbar | | | Busbar | | Busbar | |
| Electronic | | | Electronic | | | Electronic | | | Electronic | | Electronic | |
| Equipped | | | Equipped | | | Equipped | | | Equipped | | Equipped | |
| A | | | A | | | A | | | A | | A | |
| ○ | | | ○ | | | ○ | | | — | | — | |
| ○ | | | ○ | | | ○ | | | — | | — | |
| ○ | | | ○ | | | ○ | | | — | | — | |
| ○ | | | ○ | | | ○ | | | — | | — | |
| — | | | — | | | — | | | — | | — | |
| ○ | | | ○ | | | ○ | | | — | | — | |
| ○ | | | ○ | | | ○ | | | — | | — | |
| ○ | | | ○ | | | ○ | | | — | | — | |

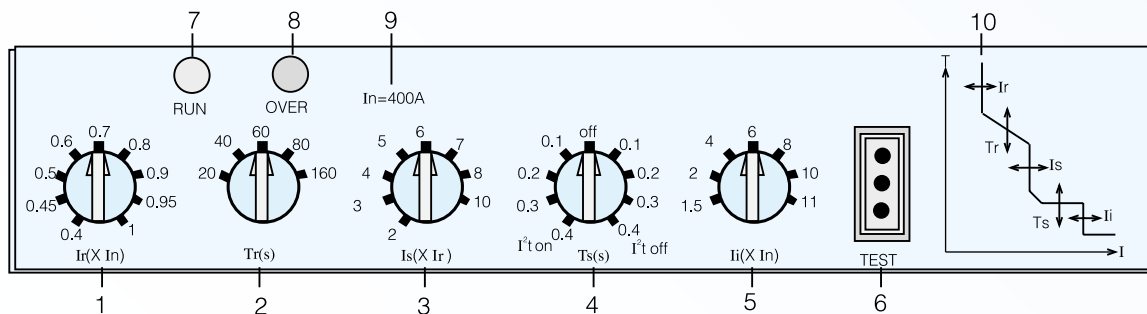
VII. Description of Control Panel

1. BM100-E, BM160-E and BM250-E



- (1) Overload long-time delay tripping current I_r setting, 9-steps setting ($I_r = 0.4/0.45/0.5/0.6/0.7/0.8/0.9/0.95/1.0 * I_n$).
- (2) Overload long-time delay tripping time T_r (2 I_r tripping time), 5-steps setting ($T_r = 20, 40, 60, 80, 160s$).
- (3) Short-circuit instantaneous current I_i setting, 7-steps setting ($I_i = 1.5/2/4/6/8/10/11 * I_n$).
- (4) Testing port is used for tripping simulation test.
- (5) Electronic trip protection characteristic curve.
- (6) Rated current
- (7) Operation indicator: indicator flashes green during normal operation.
- (8) Overload indicator: indicator flashes red if the current reaches or over 1.05 times of the current.

2. BM400-E, BM630-E, BM800-E, BM1000-E and BM1250-E



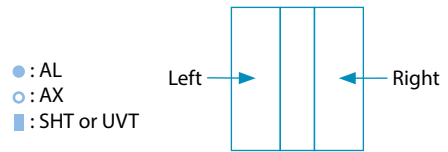
- (1) Overload long-time delay tripping current I_r setting, 9-steps setting ($I_r = 0.4/0.45/0.5/0.6/0.7/0.8/0.9/0.95/1.0 * I_n$).
- (2) Overload long-time delay tripping time T_r (2 I_r tripping time), 5-steps setting ($T_r = 20, 40, 60, 80, 160s$).
- (3) Short-circuit short-time delay tripping current I_s setting, 8-steps setting ($I_s = 2/3/4/5/6/7/8/10 * I_r$);
- (4) Short-circuit short-time delay tripping time T_s setting, 4-steps setting ($T_s = 0.1/0.2/0.3/0.4s$);
- (5) Short-circuit instantaneous current I_i setting, 7-steps setting ($I_i = 1.5/2/4/6/8/10/11 * I_n$).
- (6) Testing port is used for tripping simulation test.
- (7) Operation indicator: indicator flashes green during normal operation.
- (8) Overload indicator: indicator flashes red if the current reaches or over 1.05 times of the current.
- (9) Rated current
- (10) Electronic trip protection characteristic curve.

VIII. Optional Accessories Installation Table

| Model | Poles | AL | AX | SHT or UVT | AL + AX | AL+SHT or UVT | AX+SHT or UVT | AL+AX+SHT or UVT |
|--|----------|----|----|------------|---------|---------------|---------------|------------------|
| BM100-HE/RE/UE BM160-HE/RE/UE BM250-HE/RE/UE | 3P 4P | | | | | | | No UVT |
| BM400-HE/RE/UE | 3P 4P | | | | | | | |
| BM630-HE/RE/UE BM800-SE/HE/RE | 3P 4P | | | | | | | |
| BM1000-SE/HE BM1250-SE/HE | 3P | | | | | | | |

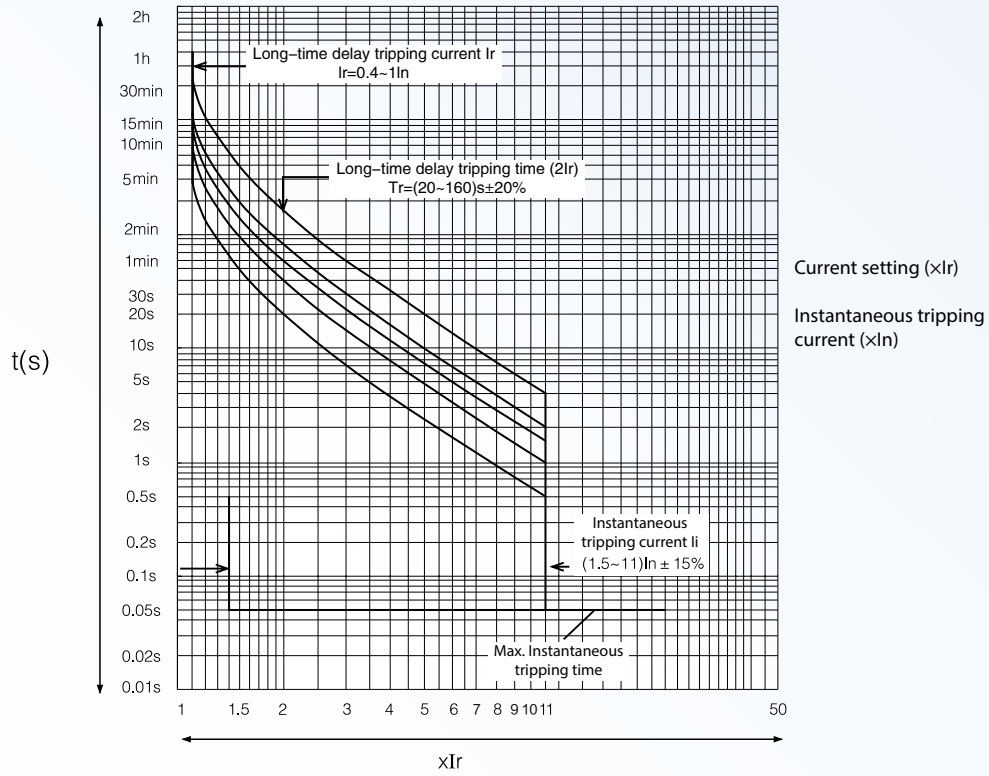
Notes:

- Standard mounting: AL/AX – left mount; SHT/UVT – right mount
- SHT equipped coil anti-burning protection switch
- Accessories of MCCB BM100, BM160 and BM250 (HE/RE/UE) right-side mount is not allowed.
- The communication function takes 2 mounting space of AL(AX); therefore BM-100-E, 160E and 250E (HE/RE/UE), can only equip either communication or AL(AX)

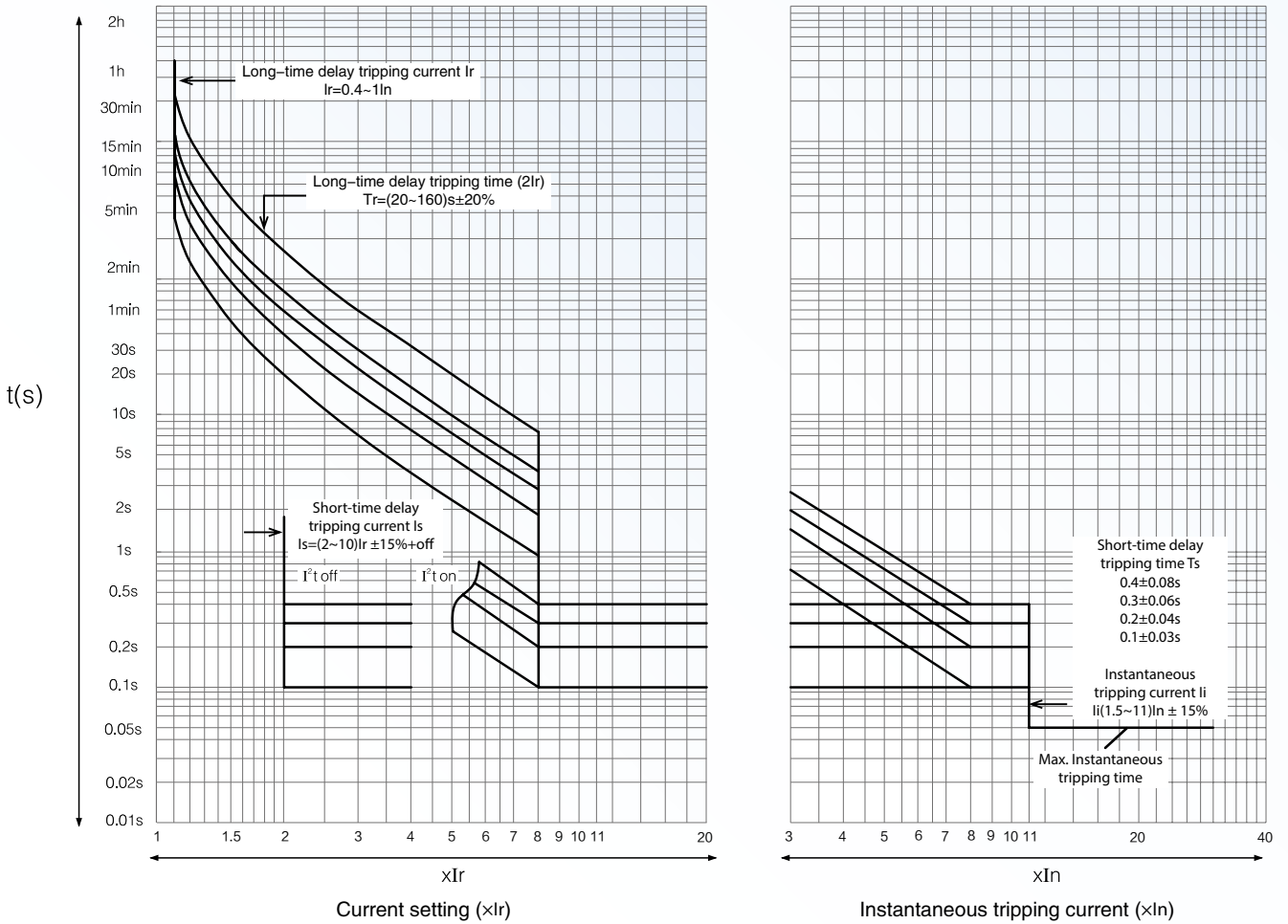


IX. Trip curve

1、BM100-E、BM160-E、BM250-E

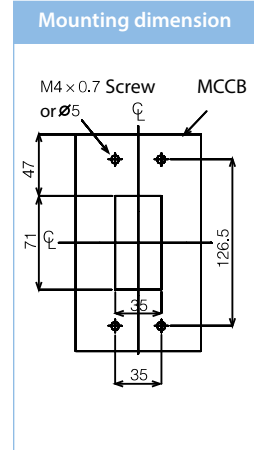
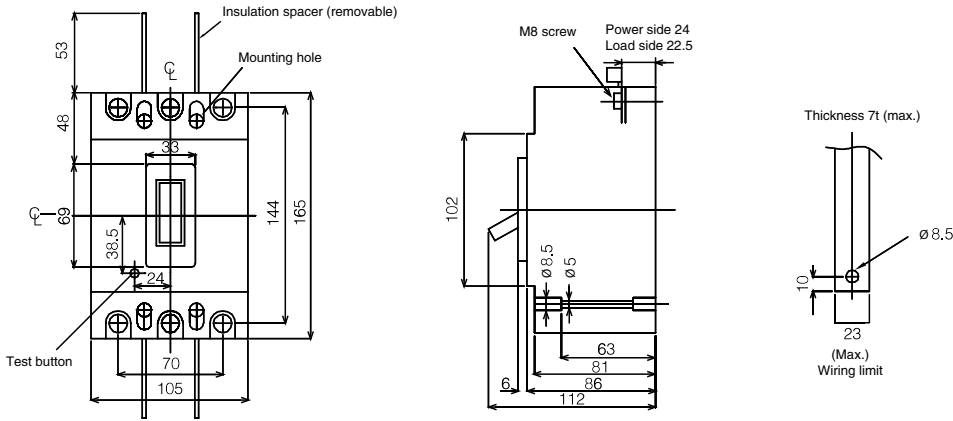


2、BM400-E、BM630-E、BM800-E、BM1000-E、BM1250-E

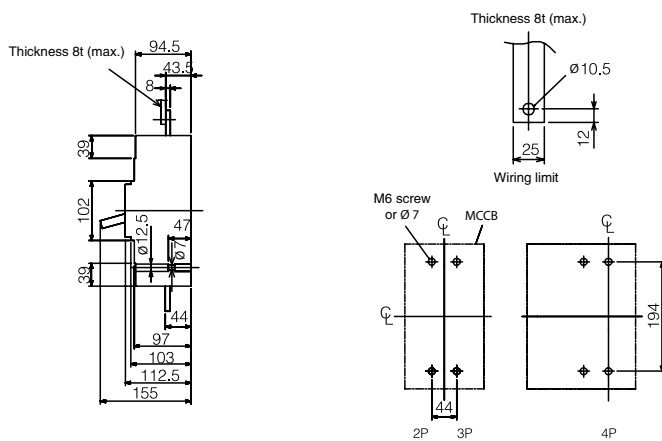
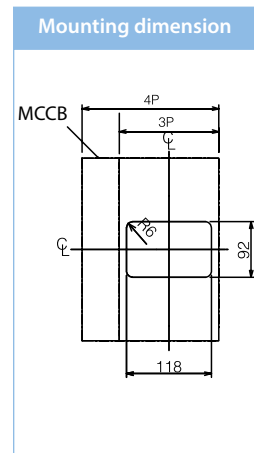
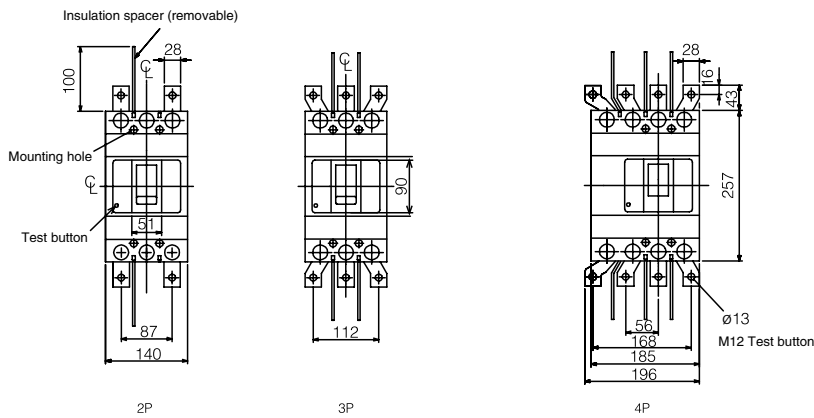


X. Dimension

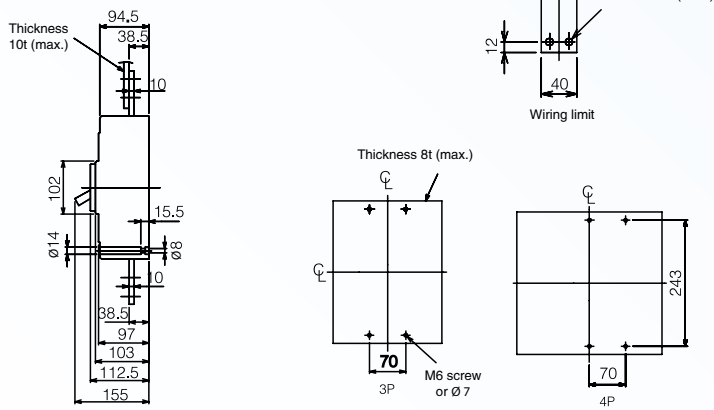
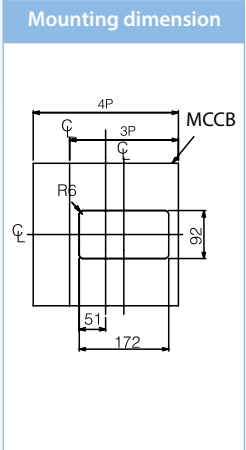
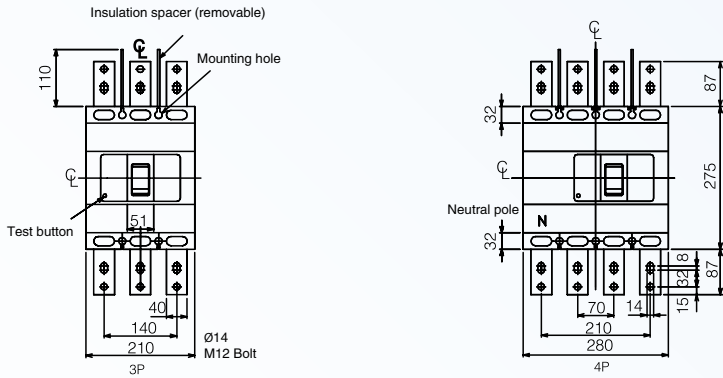
BM100-HE/RE/UE、BM160-HE/RE/UE、BM250-HE/RE/UE



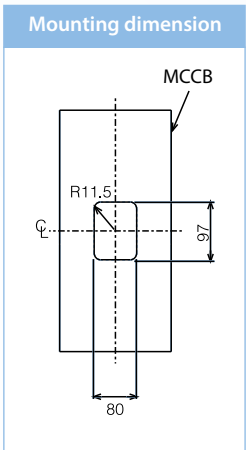
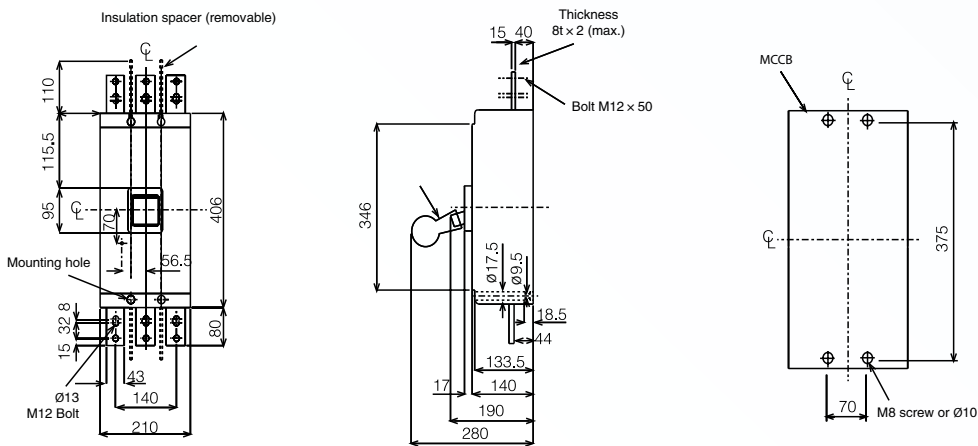
BM400-HE/RE/UE



BM630-HE/RE/UE、BM800-SE/HE/RE



BM1000-SE/HE、BM1250-SE/HE



XI. Communication function



Remote control function is available via PC system if BM-E series with ETU-COM

Communication function

- Data observe:
 - + Model, series number, Certificate of Original, Production date.
 - + Communication parameter: Potocal, Baud Rate, IP address
 - + Operation condition: ON, OFF, Trip
 - + Operation mode: Manual, Remote control
 - + Last failure history: Failure phase, error mode, current on each phase when fault, fail time
- Data measuring:
 - + Current on each phase: Ia, Ib, Ic, IN
- Data setting:
 - + Overload long-time delay tripping current(Ir) & time(Tr)
 - + Short-circuit short-time delay tripping current(Is) & time(Ts)
 - + Short-circuit instantaneous current(Ii)
 - + N Phase: 50% \times Ir, 100% \times Ir
 - + Function switch: On/Off short-circuit short time tripping and thermal memory

Memory function

- Remote operation control:
 - + Remote control ON/OFF function (Motor operation device is required)

1. ETU-COM module

ETU-COM is required for communication function on BM-E series circuit breaker, The features as below:



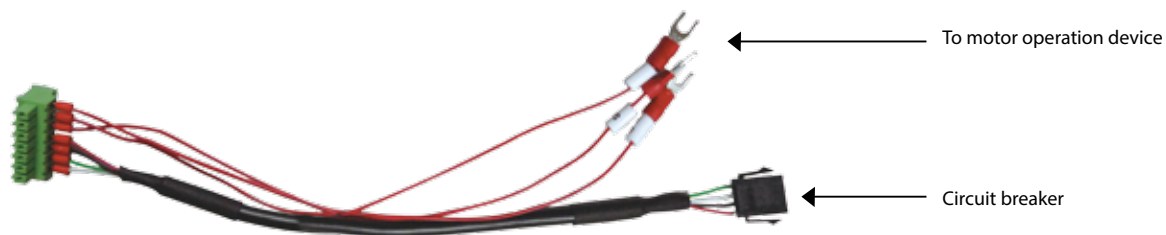
ETU-COM module

Specification :

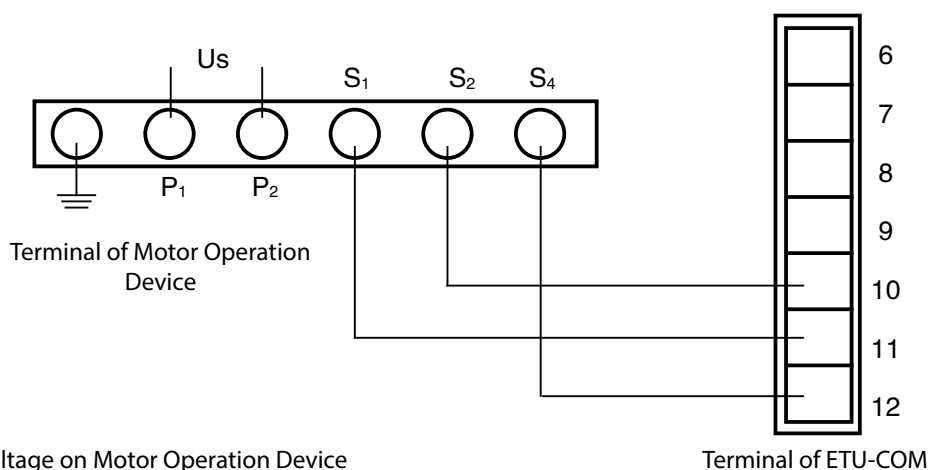
- + Protocol : RS485, ModBus-RTU
- + Baud Rate : 19200bps & 9600bps
- + IP address shall be different in the same network system
- + Data format : 1bit (Start) +8bit(Data)+ 1bit (even)+1bit(Stop)
- + Standard RS485 twisted pair communication cable
- + Max. 32 devices, 1200 meter. With RS485 repeater, more devices and distance can be made

Connection between circuit breaker and ETU-COM

- + one ETU-COM connects to one circuit breaker with special cable
- + 2 meter long standard cable



Connect with ETU-COM module & Manual Operation Device



Control voltage on Motor Operation Device
 $U_s = AC220V$ 、 $AC110V$ 、 $DC220V$ 、 $DC110V$ 、 $DC24V$

Connect with ETU-COM & ETU-HUB (HUB is required for communication function)



Communication Hub

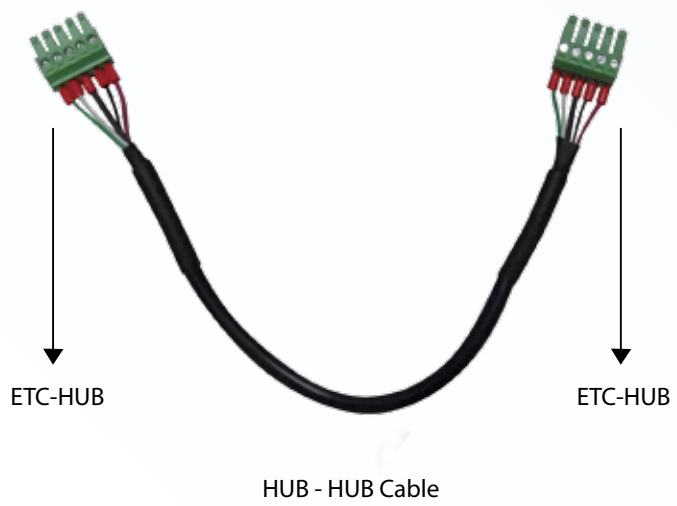
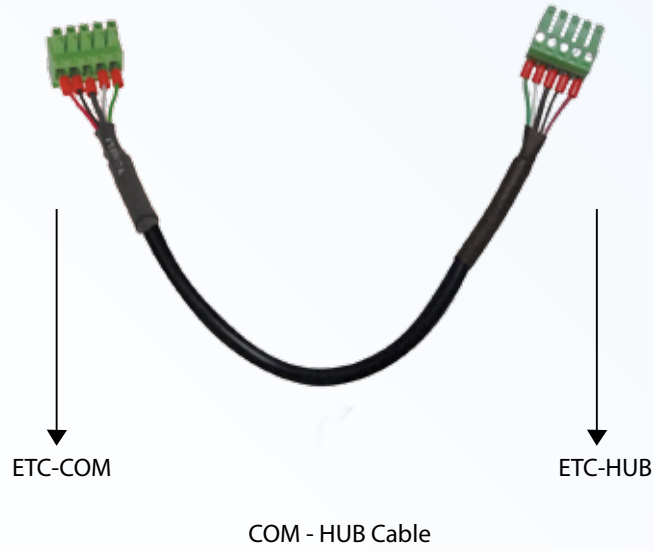
Connect with ETU-COM module & Manual Operation Device

- 6x RS485 port, Max. 5x ETU-COM
- ETU-HUB for communication port extending.
- Install on standard 35mm Din-rail

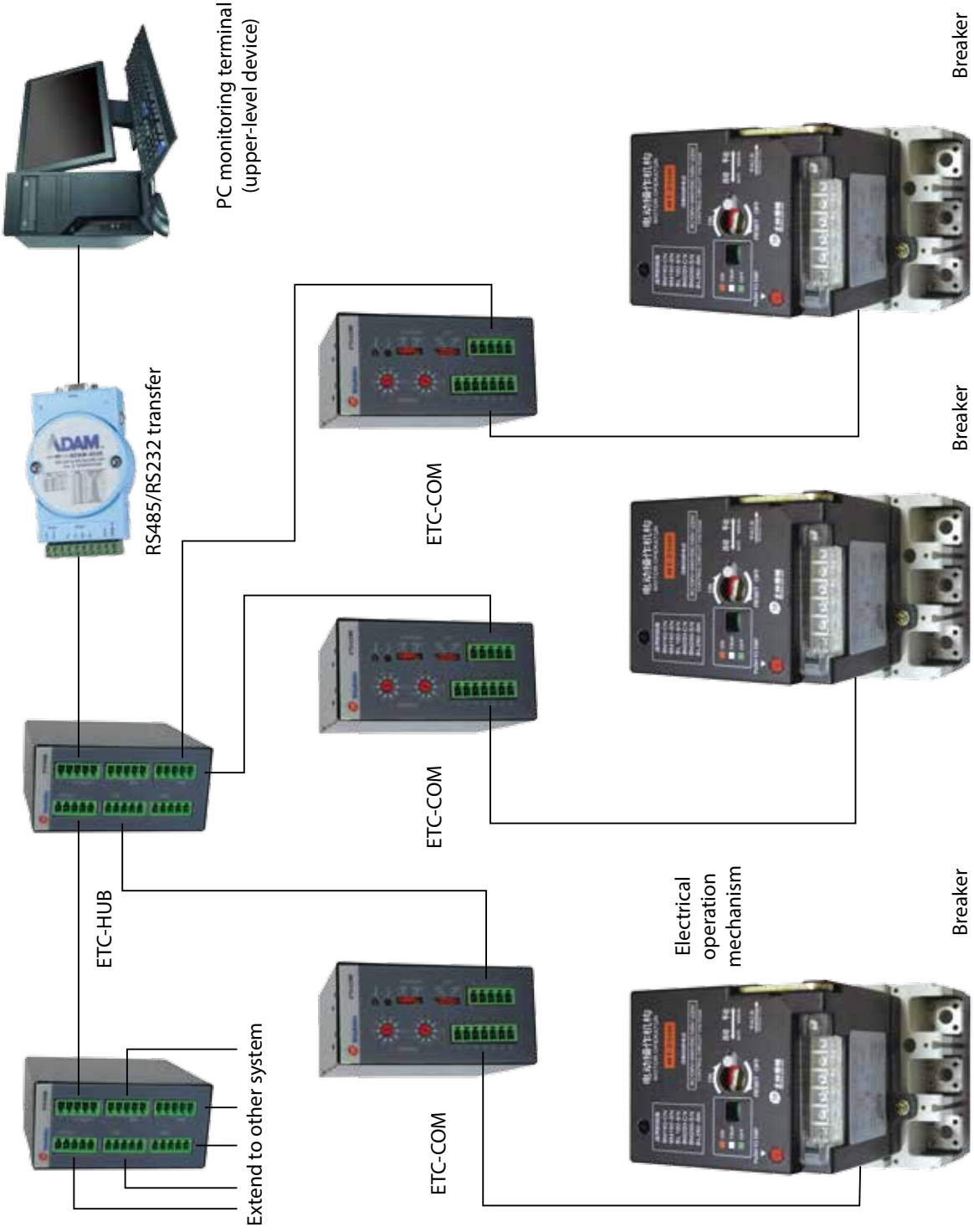
Noted:

- Special cable required.

- How to connect ETC-HUB and ETC-COM
 - +Cable in 2 meter(Standard accessory of ETC-COM)
 - +Connect between ETC-HUB and ETC-COM



2. Connection diagram



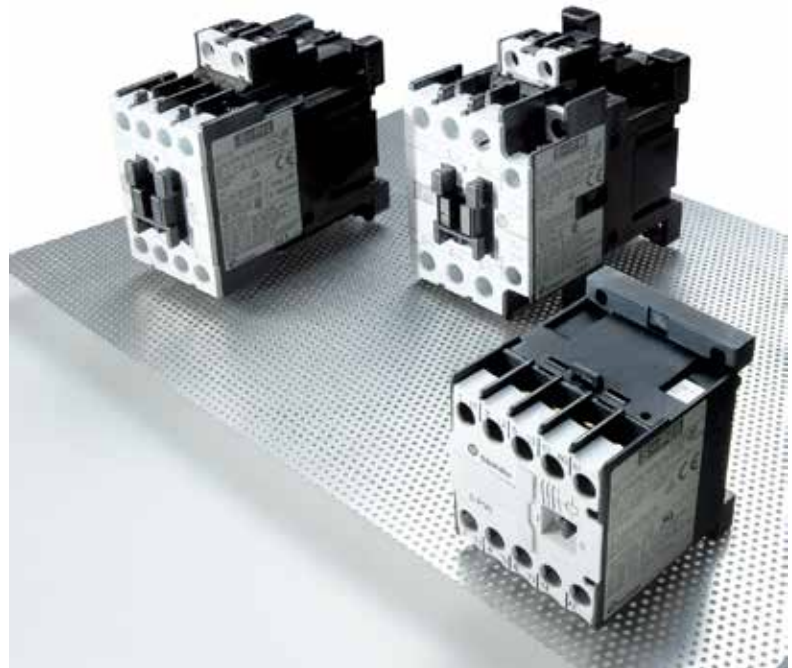


CIRCUIT BREAKER (MCCB / ELCB / EMCCB / MCB)

Breaker & Switchgear System



AIR CIRCUIT BREAKER



MOTOR CONTROL (CONTACTOR / MS / MMS)



AUTOMATIC TRANSFER SWITCHES



SURGE PROTECTIVE DEVICE



SMART METER



INVERTER



LOW VOLTAGE POWER CAPACITORS

SHIHLIN ELECTRIC & ENGINEERING

MOTOR CONTROL (CONTACTOR/ MS/ MMS), CIRCUIT BREAKER (MCCB/ ELCB/ EMCCB/ MCB), AIR CIRCUIT BREAKER, AUTOMATIC TRANSFER SWITCHES (Panel Board Type/ Residential Unit Use), SURGE PROTECTIVE DEVICE, LOW VOLTAGE POWER CAPACITORS, SMART METER, INVERTER



Breaker & switchgears overseas sales dept.

3F, No.9, Sec. 1, Chang-an E. Rd., Zhongshan Dist., Taipei City 10441, Taiwan

T. +886-2-2541-9822 F. +886-2-2581-2665

e-mail. b.export@seec.com.tw

<http://circuit-breaker.seec.com.tw>

Headquarters

16F, No.88, Sec. 6, Zhongshan N. Rd., Shilin Dist., Taipei City 11155, Taiwan

T. +886-2-2834-2662 F. +886-2-2836-6187

<http://www.seec.com.tw>

Distributor

1305.emccb-ob-2