

# ACW - Molded Case Circuit Breaker

**Guarantee of  
protection** industrial  
electrical installations

Industrial Motors

Commercial &  
Appliance Motors

**Automation**

Digital &  
Systems

Energy

Transmission &  
Distribution

Coatings

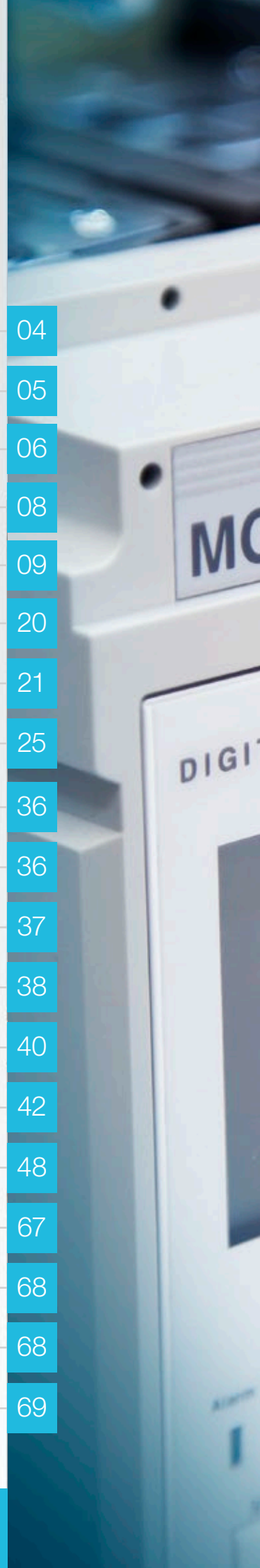


Driving efficiency and sustainability



# SUMMARY

|  |    |
|--|----|
| <b>Introduction</b>  | 04 |
| <b>Benefits</b>  | 05 |
| <b>Main characteristics</b>  | 06 |
| <b>Applications</b>  | 08 |
| <b>Constructive features</b>   | 09 |
| <b>ACW100/101/160/161/250/400/630/800/1600 standard accessories</b>                  | 20 |
| <b>Internal accessories</b>  | 21 |
| <b>External accessories</b>  | 25 |
| <b>Watt loss/ohmic resistance</b>  | 36 |
| <b>Rated current derating due to temperature rise</b>                                | 36 |
| <b>Rated current and voltage derating due to altitude</b>                            | 37 |
| <b>Conductors and terminals connections</b>  | 38 |
| <b>Installation</b>  | 40 |
| <b>Curves</b>  | 42 |
| <b>Dimensions</b>  | 48 |
| <b>ACW circuit breakers applied in electrical systems with a frequency of 400 Hz</b> | 67 |
| <b>ACW circuit breakers applied in low voltage transformer - primary use</b>         | 68 |
| <b>Coordination 2, cascading and selectivity guide</b>                               | 68 |
| <b>Circuit breakers overview</b>   | 69 |



CCB

TS  
DIGITAL TRIP RELAY



ABB  
TS  
DIGITAL TRIP RELAY





# Guarantee of protection industrial electrical installations

---

The ACW molded case circuit breakers were ***developed for the reliable protection of highly critical installations***, complying with the specific technical requirements of each application.

With a modern and compact design, the line is available in ***five different sizes, with currents ranging from 20 to 1,600 A***. In addition, it has a high breaking capacity, being suitable for the severest applications, such as those of the marine sector.



## Benefits



Guarantee of safety of the installation



High breaking capacity



Several types of tripping devices



Wide range of accessories



Suitable for different applications



Robustness and reliability

## Main characteristics

- $I_{cs} = 100\% I_{cu}$  for entire series

| $I_{cs} = I_{cu} @ 220 / 240 V$ |        | $I_{cs} = I_{cu} @ 380 / 415 V$ |        | $I_{cs} = I_{cu} @ 440 / 460 V$ |        |
|---------------------------------|--------|---------------------------------|--------|---------------------------------|--------|
| ACW100H, ACW160H                | 100 kA | ACW100H, ACW160H                | 85 kA  | ACW100H, ACW160H                | 70 kA  |
| ACW101H, ACW161H, ACW250H       | 120 kA | ACW101H, ACW161H, ACW250H       | 85 kA  | ACW101H, ACW161H, ACW250H       | 70 kA  |
| ACW400H, ACW630H                | 120 kA | ACW400H, ACW630H                | 85 kA  | ACW400H, ACW630H                | 70 kA  |
| ACW100V, ACW160V                | 200 kA | ACW100V, ACW160V                | 150 kA | ACW100V, ACW160V                | 130 kA |
| ACW101V, ACW161V, ACW250V       | 200 kA | ACW101V, ACW161V, ACW250V       | 150 kA | ACW101V, ACW161V, ACW250V       | 130 kA |
| ACW400V, ACW630V                | 200 kA | ACW400V, ACW630V                | 150 kA | ACW400V, ACW630V                | 130 kA |
| ACW800U                         | 120 kA | ACW800U                         | 100 kA | ACW800U                         | 100 kA |
| ACW1600V                        | 200 kA | ACW1600V                        | 150 kA | ACW1600V                        | 130 kA |

## Electrical circuit protection

| Model   | $I_n$ (A)                       |
|---------|---------------------------------|
| ACW100  | 20, 25, 32, 40, 50, 63, 80, 100 |
| ACW160  | 125, 160                        |
| ACW250  | 200, 250                        |
| ACW400  | 400                             |
| ACW630  | 630                             |
| ACW800  | 800                             |
| ACW1600 | 800, 1,000, 1,250, 1,600        |

## Motor branch protection

| Model  | $I_n$ (A)   |
|--------|-------------|
| ACW101 | 20, 50, 100 |
| ACW161 | 160         |
| ACW250 | 220         |
| ACW400 | 320         |
| ACW630 | 500         |
| ACW800 | 630         |



# Main characteristics



ACW100/ACW160  
In 20 ~ 160 A  
Icu = 85 kA @ 380 V  
Ics = 100% Icu



ACW250  
In 200 ~ 250 A  
Icu = 85 kA @ 380 V  
Ics = 100% Icu



ACW400/ACW630  
In 400 ~ 630 A  
Icu = 85 kA @ 380 V  
Ics = 100% Icu



ACW800  
In 800 A  
Icu = 100 kA @ 380 V  
Ics = 100% Icu



ACW1600  
In 800 ~ 1,600 A  
Icu = 70 kA @ 380 V  
Ics = 100% Icu (ACW1600V)

| Models   | ACW100                                 |                  | ACW160                       |      | ACW101  |     | ACW161                        |      | ACW250                      |     | ACW400                        |      | ACW630                 |      | ACW800                        |       | ACW1600                       |      |  |  |
|--|--|------------------|------------------------------|------|---|-----|-------------------------------|------|-----------------------------|-----|-------------------------------|------|------------------------|------|-------------------------------|-------|-------------------------------|------|--|--|
| Standard   | IEC 60947-2                            |                  |                              |      |   |     |                               |      |                             |     |                               |      |                        |      |                               |       |                               |      |  |  |
| Rated current - In (A)                             | 20, 25, 32, 40, 50, 63, 80, 100        |                  | 125, 160                     |      | 20 <sup>1)</sup> , 40, 50 <sup>1)</sup> , 80, 100 <sup>1)</sup> |     | 160 <sup>1)</sup>             |      | 200, 250, 220 <sup>1)</sup> |     | 400, 320 <sup>1)</sup>        |      | 630, 500 <sup>1)</sup> |      | 800, 630 <sup>1)</sup>        |       | 800, 1,000, 1,250, 1,600      |      |  |  |
| Rated operation voltage - U <sub>0</sub> (V)       | AC                                     |                  |                              |      |   |     |                               |      |                             |     |                               |      |                        |      |                               |       |                               |      |  |  |
|  | DC                                     |                  |                              |      |   |     |                               |      |                             |     |                               |      |                        |      |                               |       |                               |      |  |  |
| Rated isolation voltage U <sub>i</sub> (V)         | 1,000                                  |                  |                              |      |   |     |                               |      |                             |     |                               |      |                        |      |                               |       |                               |      |  |  |
| Rated impulse voltage - U <sub>imp</sub> (kV)      | 8                                      |                  |                              |      |   |     |                               |      |                             |     |                               |      |                        |      |                               |       |                               |      |  |  |
| Frequency (Hz)                                     | 50 / 60                                |                  |                              |      |   |     |                               |      |                             |     |                               |      |                        |      |                               |       |                               |      |  |  |
| Pole number  | 3                                      |                  |                              |      |   |     |                               |      |                             |     |                               |      |                        |      |                               |       |                               |      |  |  |
| Models   | ACW100 / ACW160                        |                  |                              |      | ACW101 / ACW161 / ACW250  |     |                               |      | ACW400 / ACW630             |     |                               |      | ACW800                 |      | ACW1600                       |       |                               |      |  |  |
| Short-circuit maximum breaking capacity - Icu (kA) | AC                                     | Voltage          |                              | H    | V   | H   | V                             | H    | V                           | H   | V                             | U    |                        | H    | V <sup>7)</sup>               |       |                               |      |  |  |
|  |  | 220/240 V        | 100                          | 200  | 120   | 200 | 120                           | 200  | 120                         | 200 | 120                           | 200  | 120                    | 75   | 200                           |       |                               |      |  |  |
|  |  | 380/415 V        | 85                           | 150  | 85  | 150 | 85                            | 150  | 85                          | 150 | 100                           | 150  | 100                    | 70   | 150                           |       |                               |      |  |  |
|  |  | 440/460 V        | 70                           | 130  | 70  | 130 | 85                            | 130  | 85                          | 130 | 100                           | 130  | 100                    | 65   | 130                           |       |                               |      |  |  |
|  | 480/500 V                              | 50               | 65                           | 65   | 85  | 65  | 85                            | 65   | 85                          | 85  | 85                            | 85   | 50                     | 100  |                               |       |                               |      |  |  |
|  | 525 V                                  | 35               | 50                           | 35   | 50  | 35  | 50                            | 35   | 50                          | 35  | 50                            | 35   | -                      | -    |                               |       |                               |      |  |  |
|  | 660/690 V                              | 10               | 10                           | 10   | 10  | 10  | 20                            | 35   | 20                          | 45  | -                             | -    | -                      | -    |                               |       |                               |      |  |  |
|  | DC <sup>5)</sup>                       | 250 V            |                              | 65   | 100   | 85  | 100                           | -    | -                           | -   | -                             | -    | -                      | -    | -                             |       |                               |      |  |  |
| 500 V <sup>2)</sup>                                |  | 65               | 100                          | 85   | 100   | -   | -                             | -    | -                           | -   | -                             | -    | -                      | -    |                               |       |                               |      |  |  |
| Service short-circuit breaking capacity - Ics (kA) | AC                                     | 220-525 V [%Icu] |                              | 100% |   |     |                               | 100% |                             |     |                               | 100% |                        | 100% |                               | 75%   |                               | 100% |  |  |
|  |  | 660/690 V [kA]   |                              | 5    |   |     |                               | 5    |                             |     |                               | 12   |                        | 20   |                               | 33.75 |                               | -    |  |  |
| Utilization category                               | A                                      |                  |                              |      |   |     |                               |      |                             |     |                               |      |                        |      |                               |       |                               |      |  |  |
| Isolation characteristic                           | ✓                                      |                  |                              |      |   |     |                               |      |                             |     |                               |      |                        |      |                               |       |                               |      |  |  |
| Trigger type                                       | Adjustable thermal / fixed magnetic    |                  | ✓                            |      |   |     |                               |      |                             |     |                               |      |                        |      |                               |       |                               |      |  |  |
|  | Adjustable thermal and magnetic        |                  | -                            |      |   |     |                               |      |                             |     |                               |      |                        |      |                               |       |                               |      |  |  |
|  | LSI electronic                         |                  | ✓                            |      |   |     |                               |      |                             |     |                               |      |                        |      |                               |       |                               |      |  |  |
|  | LSI electronic + ground fault          |                  | -                            |      |   |     |                               |      |                             |     |                               |      |                        |      |                               |       |                               |      |  |  |
|  | ETM electronic <sup>6)</sup>           |                  | ✓                            |      |   |     |                               |      |                             |     |                               |      |                        |      |                               |       |                               |      |  |  |
|  | Adjustable magnetic                    |                  | ✓                            |      |   |     |                               |      |                             |     |                               |      |                        |      |                               |       |                               |      |  |  |
| Mechanical life                                    | Number of operations                   |                  | 25,000                       |      |   |     | 25,000                        |      |                             |     | 20,000                        |      |                        |      | 10,000                        |       | 10,000                        |      |  |  |
| Electrical life                                    | Number of operations                   |                  | 10,000                       |      |   |     | 10,000                        |      |                             |     | 6,000                         |      |                        |      | 3,000                         |       | 5,000                         |      |  |  |
| Ambient temperature                                | -5...40 °C                             |                  |                              |      |   |     |                               |      |                             |     |                               |      |                        |      |                               |       |                               |      |  |  |
| Altitude (m)                                       | ≤2,000 m above sea level <sup>4)</sup> |                  |                              |      |   |     |                               |      |                             |     |                               |      |                        |      |                               |       |                               |      |  |  |
| Connection terminals (mm)                          | Width                                  |                  | 23                           |      |   |     | 28                            |      |                             |     | 30                            |      |                        |      | 50                            |       | 50                            |      |  |  |
| Type / screw size                                  | Phillips M8                            |                  |                              |      |   |     |                               |      |                             |     |                               |      |                        |      |                               |       |                               |      |  |  |
| Tightening torque (Nm)                             | 8                                      |                  |                              |      |   |     |                               |      |                             |     |                               |      |                        |      |                               |       |                               |      |  |  |
| Section of conductor                               | Cables <sup>3)</sup>                   |                  | 16 (1x)...95 mm <sup>2</sup> |      |   |     | 16 (1x)...150 mm <sup>2</sup> |      |                             |     | (2x) 85...240 mm <sup>2</sup> |      |                        |      | (3x) 85...240 mm <sup>2</sup> |       | (3x) 85...240 mm <sup>2</sup> |      |  |  |
|  | Bar                                    |                  | 20 x 5 mm                    |      |   |     | 25 x 5 mm                     |      |                             |     | 30 x 10 mm                    |      |                        |      | 50 x 10 mm                    |       | 50 x 10 mm                    |      |  |  |
| Weight (kg)  | 1.5                                    |                  |                              |      |   |     |                               |      |                             |     |                               |      |                        |      |                               |       |                               |      |  |  |
| Dimensions - W x H x D (mm)                        | 90 x 140 x 86                          |                  |                              |      |   |     |                               |      |                             |     |                               |      |                        |      |                               |       |                               |      |  |  |

Notes: 1) Available with adjustable magnetic release only.  
 2) 2 poles in series.  
 3) Using cable glands PC2 ACW.  
 4) For altitudes above 2,000 meters above sea level, the current must be derated as recommended.  
 5) DC applications not available for ETS and ETM tripping devices.  
 6) The ETM trigger is provided with RS485 network communication, Modbus.  
 7) ACW1600V available only in 800 A and 1,000 A currents.

# Applications



Mining



Marine



Oil & Gas



Steel



# Constructive features



## Available releases

- FMU – Adjustable-thermal and fixed-magnetic



- ATU – Adjustable-thermal and adjustable-magnetic



- ETS – Eletronic LSI



- MTU – Magnetic only



- ETM – Multifunctional Electronic



| Reference        | I <sub>b</sub> (A) | Current setting range (A) | Code     |
|------------------|--------------------|---------------------------|----------|
| ACW100H-FMU20-3  | 20                 | 16...20                   | 11111144 |
| ACW100H-FMU25-3  | 25                 | 20...25                   | 11111170 |
| ACW100H-FMU32-3  | 32                 | 25.6...32                 | 11111172 |
| ACW100H-FMU40-3  | 40                 | 32...40                   | 11111173 |
| ACW100H-FMU50-3  | 50                 | 40...50                   | 11111174 |
| ACW100H-FMU63-3  | 63                 | 50.4...63                 | 11111175 |
| ACW100H-FMU80-3  | 80                 | 64...80                   | 11111176 |
| ACW100H-FMU100-3 | 100                | 80...100                  | 11111177 |
| ACW160H-FMU125-3 | 125                | 100...125                 | 11111219 |
| ACW160H-FMU160-3 | 160                | 128...160                 | 11111221 |
| ACW100V-FMU20-3  | 20                 | 16...20                   | 10583682 |
| ACW100V-FMU25-3  | 25                 | 20...25                   | 10583683 |
| ACW100V-FMU32-3  | 32                 | 25.6...32                 | 10583684 |
| ACW100V-FMU40-3  | 40                 | 32...40                   | 10583691 |
| ACW100V-FMU50-3  | 50                 | 40...50                   | 10583685 |
| ACW100V-FMU63-3  | 63                 | 50.4...63                 | 10583686 |
| ACW100V-FMU80-3  | 80                 | 64...80                   | 10583687 |
| ACW100V-FMU100-3 | 100                | 80...100                  | 10583688 |
| ACW160V-FMU125-3 | 125                | 100...125                 | 10583689 |
| ACW160V-FMU160-3 | 160                | 125...160                 | 10583690 |

| Reference        | I <sub>b</sub> (A) | Current setting range (A) | Code     |
|------------------|--------------------|---------------------------|----------|
| ACW250H-ATU200-3 | 200                | 160...200                 | 11111344 |
| ACW250H-ATU250-3 | 250                | 200...250                 | 11111342 |
| ACW250V-ATU200-3 | 200                | 160...200                 | 10583692 |
| ACW250V-ATU250-3 | 250                | 200...250                 | 10583693 |

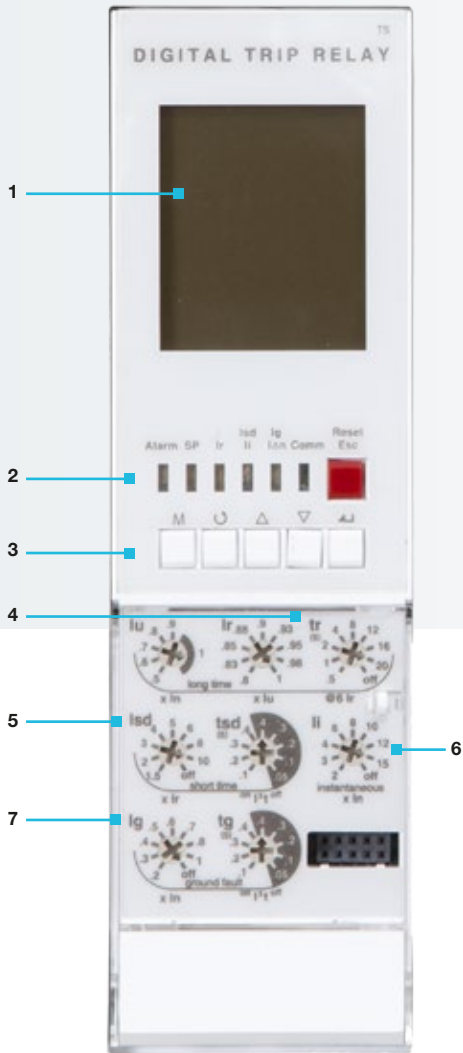
| Reference        | I <sub>b</sub> (A) | Current setting range (A) | Code     |
|------------------|--------------------|---------------------------|----------|
| ACW101H-ETS40-3  | 40                 | 16...40                   | 12427231 |
| ACW101H-ETS80-3  | 80                 | 32...80                   | 12427232 |
| ACW161H-ETS160-3 | 160                | 64...160                  | 12427235 |
| ACW250H-ETS250-3 | 250                | 100...250                 | 12427237 |
| ACW400H-ETS400-3 | 400                | 160...400                 | 11111394 |
| ACW630H-ETS630-3 | 630                | 252...630                 | 11111408 |
| ACW101V-ETS40-3  | 40                 | 16...40                   | 12427233 |
| ACW101V-ETS80-3  | 80                 | 32...80                   | 12427234 |
| ACW161V-ETS160-3 | 160                | 64...160                  | 12427236 |
| ACW250V-ETS250-3 | 250                | 100...250                 | 12427298 |
| ACW400V-ETS400-3 | 400                | 160...400                 | 10583694 |
| ACW630V-ETS630-3 | 630                | 252...630                 | 10583695 |
| ACW800V-ETS800-3 | 800                | 320...800                 | 10583696 |

| Reference        | I <sub>b</sub> (A) | Current setting range (A)                | Code     |
|------------------|--------------------|--|----------|
| ACW101H-MTU20-3  | 20                 | I <sub>m</sub> = 6...12 x I <sub>n</sub> | 11111283 |
| ACW101H-MTU50-3  | 50                 |  | 11111306 |
| ACW101H-MTU100-3 | 100                |  | 11111301 |
| ACW161H-MTU160-3 | 160                |  | 11111266 |
| ACW250H-MTU220-3 | 220                |  | 11111388 |
| ACW400H-MTU320-3 | 320                |  | 11111396 |
| ACW630H-MTU500-3 | 500                |  | 11111406 |
| ACW101V-MTU20-3  | 20                 |  | 10583697 |
| ACW101V-MTU50-3  | 50                 |  | 10583699 |
| ACW101V-MTU100-3 | 100                |  | 10583701 |
| ACW161V-MTU160-3 | 160                |  | 10583702 |
| ACW250V-MTU220-3 | 220                |  | 10583703 |
| ACW400V-MTU320-3 | 320                |  | 10940133 |
| ACW630V-MTU500-3 | 500                |  | 10940135 |
| ACW800V-MTU630-3 | 630                | 10940149                                 |          |

| Reference           | I <sub>b</sub> (A) | Current setting range (A) | Code     |
|---------------------|--------------------|---------------------------|----------|
| ACW400H-ETM400-AC-3 | 400                | 160...400                 | 12673278 |
| ACW630H-ETM630-AC-3 | 630                | 252...630                 | 12673279 |
| ACW800U-ETM800-AC-3 | 800                | 320...800                 | 12673280 |

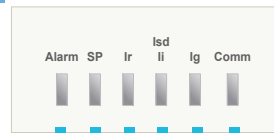
# Constructive features

## Trip unit AG1



1 Display

2 Indication LEDs



- Comm: indication of communication status (optional)
- Ig: ground fault indication (G)
- Isd/li: indication of instantaneous short-circuit tripping (I)
- Ir: indication of timed short-circuit tripping (S)
- SP: indication of self-protection and battery test
- Alarm: overload tripping indication (L)

3 Indication keys



- Fault reset/exit menu
- Enter
- Cursor up/increase value
- Cursor down/decrease value
- Move cursor or valor to the sides
- Menu

4 Ir: adjustment of the overload current (L protection function)  
tr: Ir current time delay

5 Isd: adjustment of the protection functions

6 li: instantaneous short-circuit tripping current

7 Ig: ground fault detection current (G protection function)

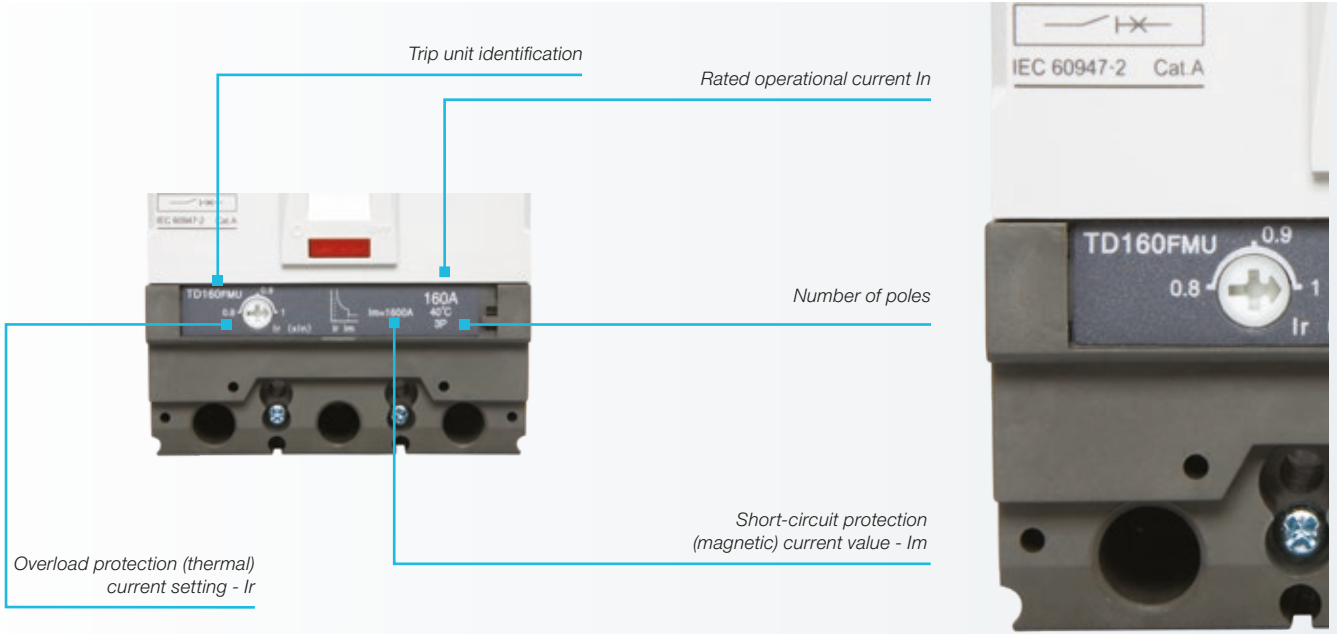
### AG1



| Reference          | Operating frequency (Hz) | $I_e$ (A) | Adjustment range (A) | Code     |
|--------------------|--------------------------|-----------|----------------------|----------|
| ACW1600H-AG1800-3  | 60                       | 800       | 320...800            | 12733275 |
| ACW1600H-AG11000-3 | 60                       | 1,000     | 400...1,000          | 12733276 |
| ACW1600H-AG11250-3 | 60                       | 1,250     | 500...1,250          | 12733277 |
| ACW1600H-AG11600-3 | 60                       | 1,600     | 640...1,600          | 12733328 |
| ACW1600V-AG1800-3  | 60                       | 800       | 320...800            | 12733329 |
| ACW1600V-AG11000-3 | 60                       | 1,000     | 400...1,000          | 12733330 |
| ACW1600H-AG6800-3  | 50                       | 800       | 320...800            | 17187703 |
| ACW1600H-AG61000-3 | 50                       | 1,000     | 400...1,000          | 17187704 |
| ACW1600H-AG61250-3 | 50                       | 1,250     | 500...1,250          | 13739124 |
| ACW1600H-AG61600-3 | 50                       | 1,600     | 640...1,600          | 13739125 |
| ACW1600V-AG6800-3  | 50                       | 800       | 320...800            | 17187933 |
| ACW1600V-AG61000-3 | 50                       | 1,000     | 400...1,000          | 17187934 |

# Constructive features

## Trip unit FMU Adjustable-thermal and fixed-magnetic



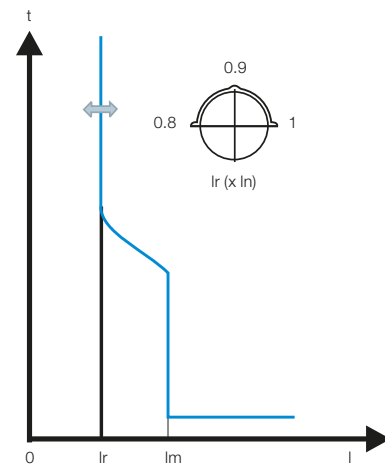
### Setting ranges of trip units

#### Thermal trip unit

|                             |                       |
|-----------------------------|-----------------------|
| Current setting (A) - $I_r$ | 0.8; 0.9; 1.0 x $I_n$ |
|-----------------------------|-----------------------|

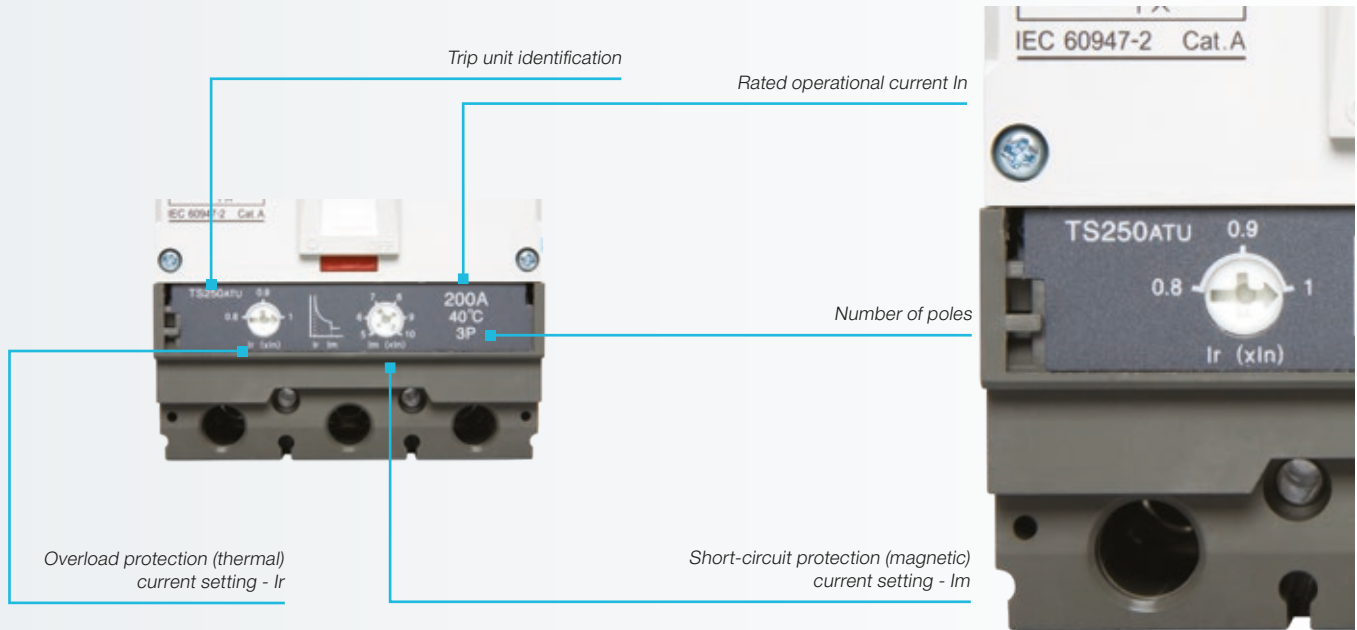
#### Magnetic trip unit

|                     |                |                     |
|---------------------|----------------|---------------------|
| Current (A) - $I_m$ | 20 ~ 40        | 50 ~ 160            |
|                     | Fixed at 400 A | Fixed at 10 x $I_n$ |



# Constructive features

## Trip unit ATU Adjustable-thermal and adjustable-magnetic



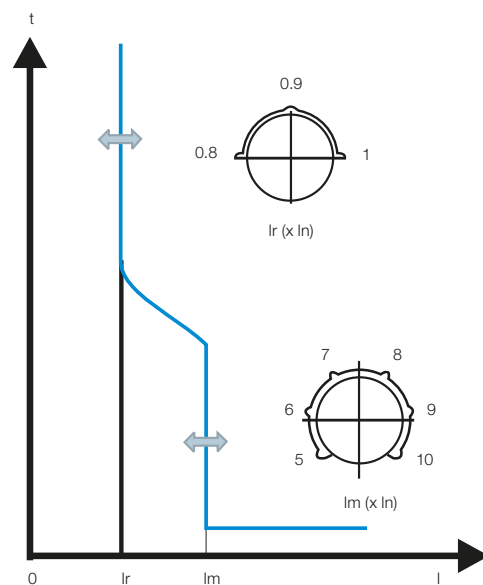
### Setting ranges of trip units

#### Thermal trip unit

|                             |                       |
|-----------------------------|-----------------------|
| Current setting (A) - $I_r$ | 0.8; 0.9; 1.0 x $I_n$ |
|-----------------------------|-----------------------|

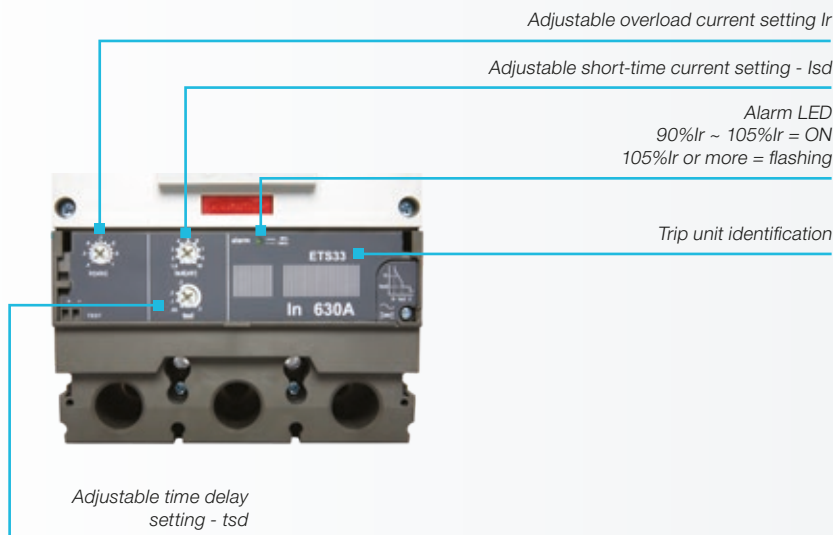
#### Magnetic trip unit

|                     |                           |
|---------------------|---------------------------|
| Current (A) - $I_m$ | 5; 6; 7; 8; 9; 10 x $I_n$ |
|---------------------|---------------------------|



# Constructive features

## Trip unit ETS



### Setting ranges of trip units

#### Overload protection L (long time)

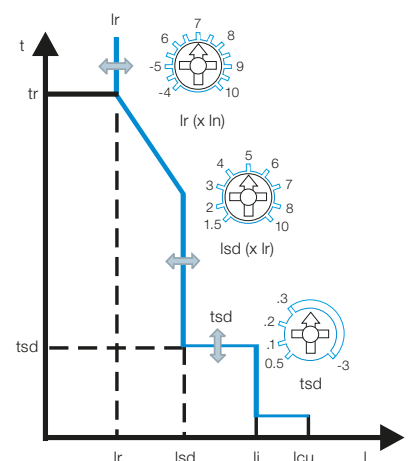
|                             |  |
|-----------------------------|--|
| Setting current (A) - $I_r$ | 0.4; 0.45; 0.5; 0.55; 0.6; 0.65; 0.7; 0.75; 0.8; 0.85; 0.9; 0.95; $1.0 \times I_n$ |
| Tripping time (s)           | Fixed @ $6 \times I_r$ (tolerance $\pm 20\%$ )                                     |

#### Protection function S (short delay)

|                                |   |
|--------------------------------|---|
| Setting current (A) - $I_{sd}$ | 1.5; 2; 3; 4; 5; 6; 7; 8; $10 \times I_r$ (tolerance $\pm 15\%$ ) |
| Tripping delay (ms) - $t_{sd}$ | 50; 100; 200; 300 (tolerance $\pm 20\%$ )                         |

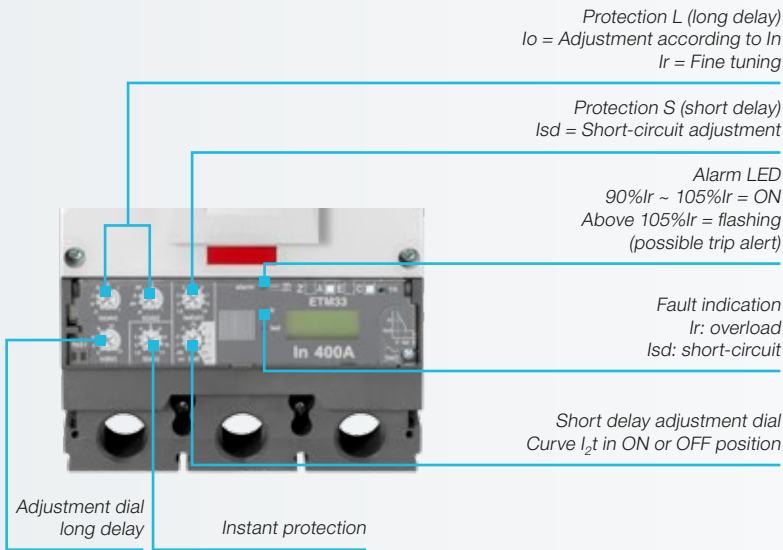
#### Protection function I (instantaneous)

|                     |                          |
|---------------------|--------------------------|
| Current (A) - $I_i$ | Fixed at $11 \times I_n$ |
|---------------------|--------------------------|



# Constructive features

## Trip unit ETM-AC Multifunctional electronic



### Adjustment ranges of the protection functions

#### Protection function L (long delay)

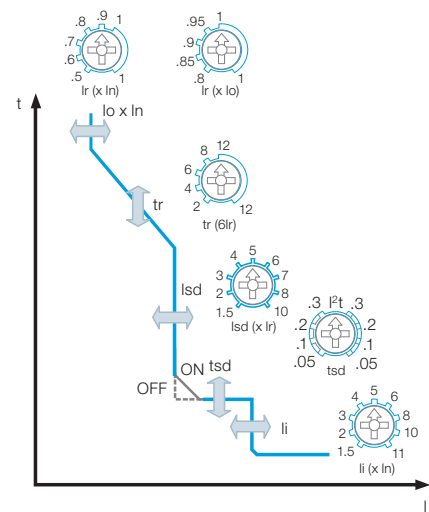
|                                |   |
|--------------------------------|---|
| Adjustment current (A) - $I_r$ | 0.4 ~ 1.0 x $I_n$                                 |
| Time delay (s)                 | Adjustable 2; 4; 6; 8; 12 (tolerance $\pm 20\%$ ) |

#### Protection function S (short delay)

|                                   |  |               |                |                 |                 |
|-----------------------------------|--|---------------|----------------|-----------------|-----------------|
| Adjustment current (A) - $I_{sd}$ | 1,5; 2; 3; 4; 5; 6; 7; 8; 10 x $I_r$ (tolerance $\pm 15\%$ ) |               |                |                 |                 |
| Time delay (ms) - $t_{sd}$        | Time delay (ms)  | 50            | 100            | 200             | 300             |
|                                   | Operating time (ms)  | 30 < $\pm 70$ | 70 < $\pm 140$ | 140 < $\pm 240$ | 240 < $\pm 350$ |

#### Protection function I (instantaneous)

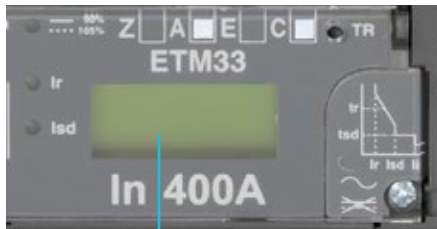
|                     |                                    |
|---------------------|------------------------------------|
| Current (A) - $I_i$ | 1.5; 2; 4; 5; 6; 8; 10; 11 x $I_n$ |
|---------------------|------------------------------------|



# Constructive features

## Trip unit ETM-AC Multifunctional electronic

### Ammeter



- Accuracy:  $\pm 10\%$
- The largest current will be shown on the top line
- Reading limits:
  - Minimum current  $\geq 0.3 \times I_n$  (one phase)
  - Maximum current  $\leq 10 \times I_n$

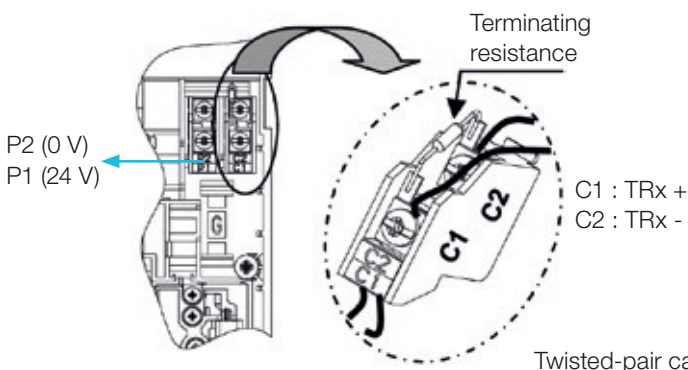
|   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|
| I | r | - | 1 | 2 | 6 | 0 | A |
| I | s | - |   |   | 6 | 5 | A |

- Displays the current RMS value of the phase with the highest value
- Displays the current RMS value of each phase alternating every 2 seconds

### Built-in network communication

- Communication interface: RS485, Modbus-RTU
- Information available:
  - Parameterization of values
  - Higher current between the 3 phases
  - Values of the currents of each phase
  - Fault information: overcurrent, short-circuit, etc.
- Setting the network address using the TR button and LCD display
- External 24 Vdc supply required

### Connections - RS485 and external supply



**CAUTION**

The line should be terminated at both ends in its characteristic impedance (120  $\Omega$ ) and an external 24 Vdc power is required in P1 (24 V) and P (0 V) terminals.

# Constructive features

## Trip unit ETM-AC

### Multifunctional electronic

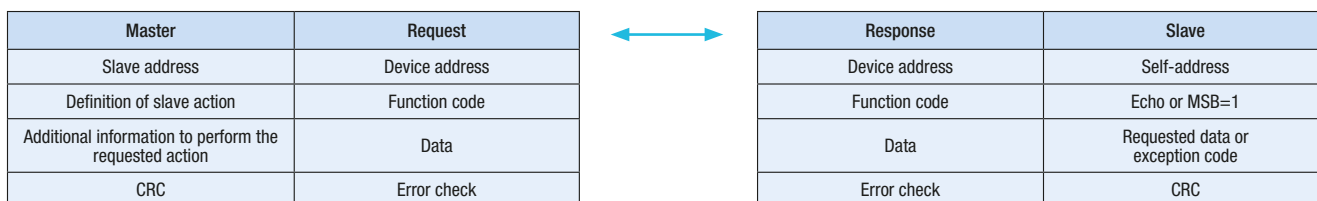
- Network communication
- Communication protocol

### Physical layer

- Communication port: RS485
- Asynchronous format: each character is composed of 10 bit (1 start bit + 8 data bits + 1 stop bit)
- Baud rate: 19,200 bps
- Data Bits: 8 bits
- Parity: no parity
- Stop Bits: 1 bits
- Master-Slave method: only master is qualified for requesting, while slave delivers the requested data and response to the required performance according to inquiry

### Data link layer

| Description   | Size                        |
|---------------|-----------------------------|
| Slave address | 1 byte                      |
| Function code | 1 byte                      |
| Data          | N byte                      |
| CRC           | 2 byte                      |
| Dead time     | 3.5 bytes transmission time |



- Slave address
  - Valid slave device address range : 0~247 decimal.
  - Slave device address range in practice : 1~32 decimal.
  - If the range of slave device address of the requested frame by master is 0, it means that master device broadcasts to all slaves.
  - In case that master requests to slave, fill the relative slave address in address field and send it.
  - If slave responses to master, fill its own address in address field and send it.
- Function code
  - Valid range: 1~255.
  - Normal: 1~127, error: 129 ~ 255 (normal + 0x80).
  - It defines slave's requested action by master.
  - Slave enters the following.
    - In case of normal response: echo the function code requested, as it stands.
    - In case of exceptional response: set to 1 as MSB of the function code requested and fill it in.
- Dead Time - Time Out
  - Frame is completed only when it has silent interval more than 3.5 character time after receiving the last character.
  - 1 character time is approximately 0.5ms since BPS is 19,200.
  - (700ms to 1,000ms is recommended for the interval of master's request.)

### Modbus exception codes

| Code | Name                 |
|------|----------------------|
| 0x01 | Illegal function     |
| 0x02 | Illegal data address |
| 0x12 | Illegal adu length   |



# Constructive features

## Trip unit ETM-AC Multifunctional electronic

- Network communication
- Communication protocol

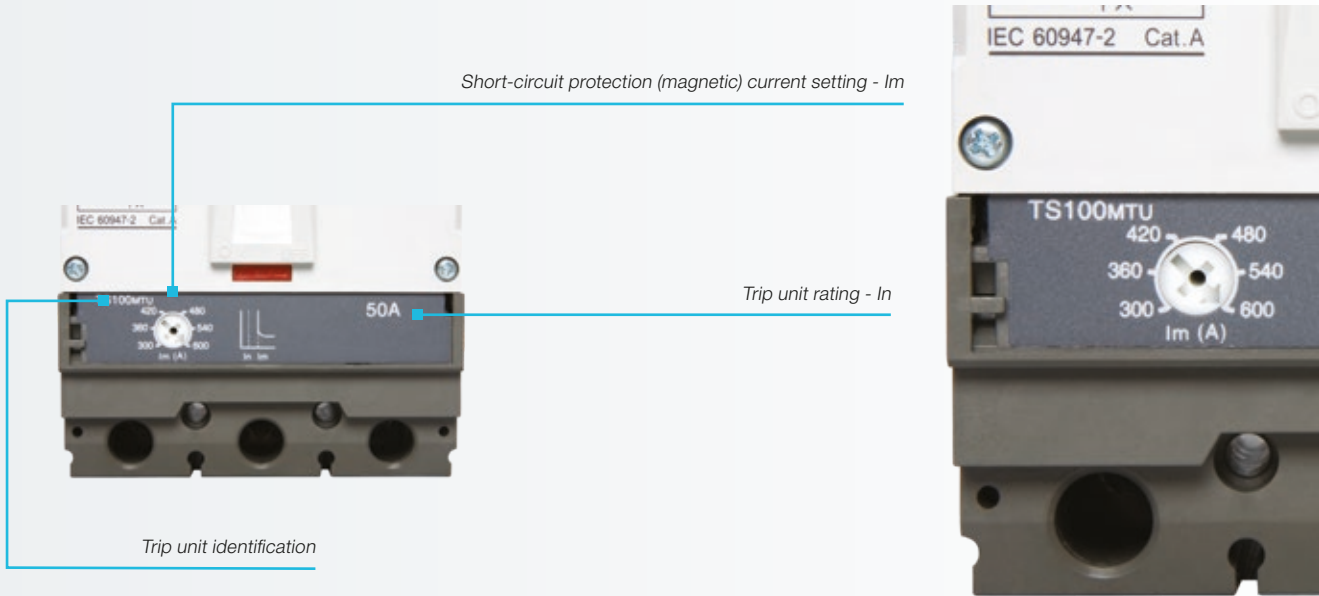
| Function code | Name              | Characteristic | Type             | Register  | Address | Format | Reference   |
|---------------|-------------------|----------------|------------------|---|---------|--------|---|
| 0x03          | Read holding reg. | R              | lo ( x ln)       | 40001   | 40000   | F001   | Position of decimal rotary switch (1~9)   |
|               |                   |                | lr ( x lo)       |   |         | F001   | Position of decimal rotary switch (1~9)   |
|               |                   |                | tr               | 40002   | 40001   | F001   | Position of decimal rotary switch (1~9)   |
|               |                   |                | li               |   |         | F001   | Position of decimal rotary switch (1~9)   |
|               |                   |                | tsd              | 40003   | 40002   | F001   | Position of decimal rotary switch (1~9)   |
|               |                   |                | lsd              |   |         | F001   | Position of decimal rotary switch (1~9)   |
|               |                   |                | lg               | 40004   | 40003   | F001   | Position of decimal rotary switch (1~9)   |
|               |                   |                | Tg               |   |         | F001   | Position of decimal rotary switch (1~9)   |
|               |                   |                | lr               | 40005   | 40004   | F002   | Current value on long-time setting  |
|               |                   |                | lsd              | 40006   | 40005   | F002   | Current value on short-time setting   |
|               |                   |                | li               | 40007   | 40006   | F002   | Instantaneous current value   |
| lg            | 40008             | 40007          | F002             | Current value on earth-fault setting (shows 0 at earth-fault-off) |         |        |   |
| 0x04          | Red input reg.    | R only         | Imax phase       | 30001   | 30000   | F001   | The highest current value on T/S/T - phase and the phase's information (0~2)          |
|               |                   |                | Display mode     |   |         | F001   | CT rating: 3P160, 3P250, 3P400, 3P630, 3P800, 4P160, 4P250, 4P400, 4P630, 4P800 (0~9) |
|               |                   |                | Trip information | 30002   | 30001   | F003   | Resource of trip phase, trip  |
|               |                   |                | State            |   |         | F004   | ZSI information, ZSI input on short-time/ earth-fault tripping, MCCB transmission     |
|               |                   |                | lr               | 30003   | 30002   | F002   | Effective current value on R-phase  |
|               |                   |                | ls               | 30004   | 30003   | F002   | Effective current value on S-phase  |
|               |                   |                | lt               | 30005   | 30004   | F002   | Effective current value on T-phase  |
|               |                   |                | ln               | 30006   | 30005   | F002   | Effective current value on N-phase  |
|               |                   |                | Imax             | 30007   | 30006   | F002   | The highest effective current value among R/S/T-phase                                 |
| Trip current  | 30008             | 30007          | F002             | Effective current value on tripping                               |         |        |   |

| Trip information (F003)                                |                     |                    |                        |   |                  |                  |                  |
|--|---------------------|--------------------|------------------------|---|------------------|------------------|------------------|
| Bit7   | Bit6                | Bit5               | Bit4                   | Bit3  | Bit2             | Bit1             | Bit0             |
| Earth-fault tripping                                   | Short-time tripping | Long-time tripping | Instantaneous tripping | N-phase tripping  | T-phase tripping | S-phase tripping | R-phase tripping |
| Set a bit, out of bit 4 to 7, to 1 when trouble occurs |                     |                    |                        | Set a bit, out of bit 0 to 3, to 1 when trouble occurs<br>All bits show 0 when earth-fault occurs |                  |                  |                  |

|           | Register address | Address | Note   |
|-----------|------------------|---------|--|
| lo (x ln) | 40001            | 40000   | 1 - 0.5 / 2 - 0.6 / 3 - 0.7 / 4 - 0.8 / 5 - 0.9 / 6 - 1.0 / 7 - 1.0 / 8 - 1.0 / 9 - 1.0  |
| lr (x lo) |                  |         | 1 - 0.8 / 2 - 0.85 / 3 - 0.9 / 4 - 0.95 / 5 - 1.0 / 6 - 1.0 / 7 - 1.0 / 8 - 1.0 / 9 - 1.0  |
| Tr        | 40002            | 40001   | 1 - 2 / 2 - 4 / 3 - 6 / 4 - 8 / 5 - 12 / 6 - 12 / 7 - 12 / 8 - 12 / 9 - 12   |
| li        |                  |         | 1 - 1.5 / 2 - 2 / 3 - 3 / 4 - 4 / 5 - 5 / 6 - 6 / 7 - 8 / 8 - 10 / 9 - 11  |
| Tsd       | 40003            | 40002   | 1 - 0.05 (on) / 2 - 0.1 (on) / 3 - 0.2 (on) / 4 - 0.3 (on) / 5 - 0.3 (on) / 6 - 0.3 (off) / 7 - 0.2 (off) / 0 - 0.1 (off) / 9 - 0.05 (off) |
| lsd       |                  |         | 1 - 1.5 / 2 - 2 / 3 - 3 / 4 - 4 / 5 - 5 / 6 - 6 / 7 - 7 / 8 - 8 / 9 - 10   |
| lg        | 40004            | 40003   | 1 - 0.2 / 2 - 0.3 / 3 - 0.4 / 4 - 0.5 / 5 - 0.6 / 6 - 0.7 / 7 - 0.8 / 8 - 1.0 / 9 - off  |
| Tg        |                  |         | 1 - 0.1 (on) / 2 - 0.2 (on) / 3 - 0.3 (on) / 4 - 0.4 (on) / 5 - 0.4 (on) / 6 - 0.4 (off) / 7 - 0.3 (off) / 8 - 0.2 (off) / 9 - 0.1 (off)   |

# Constructive features

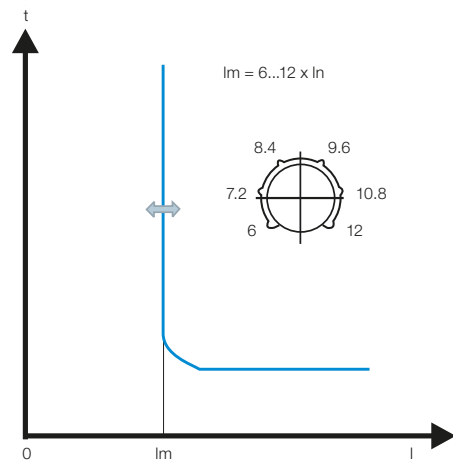
## Trip unit MTU



### Setting ranges of trip units

#### Magnetic trip unit

|                     |                                    |
|---------------------|------------------------------------|
| Current (A) - $I_m$ | 6; 7.2; 8.4; 9.6; 10.8; 12 x $I_n$ |
|---------------------|------------------------------------|



# Constructive features

## AG1 tripping device

### Technical data

The AG1 tripping device has characteristics that meet the requirements of most systems and applications. Supplied as standard for ACW1600 circuit breakers.

- Overload protection (L)
  - Long delay
- Short-circuit protection
  - Short delay (S)
  - Instantaneous (I)
  - I<sup>2</sup>t ON/OFF optional (short delay)
- Ground fault protection (G)
  - I<sup>2</sup>t ON/OFF optional
- Fault event log
  - Up to 10 faults
- 3 fixed digital outputs to indicate protection alarm
  - Operating frequency: 50 Hz and 60 Hz

*Note: the circuit breaker that operates at 50 Hz (AG6) is not the same circuit breaker that operates at 60 Hz. See the tripping device table on page 7. When no auxiliary power supply is connected, the display is self-powered via the power circuit with current conduction from 25% of the circuit breaker rating.*

### Display







The home screen indicates the instantaneous current values per phase. It is also possible to check other kinds of information, available in different menus.

### Indication LEDs

| LED    | Function   |
|--------|--|
| Alarm  | Indicates overload alarm (L)                       |
| SP     | Indicates self-protection and battery test         |
| IR     | Indicates timed short-circuit tripping (S)         |
| Isd/Ii | Indicates instantaneous short-circuit tripping (I) |
| Ig     | Indicates ground fault (G)                         |
| Comm   | Indicates the communication status (optional)      |

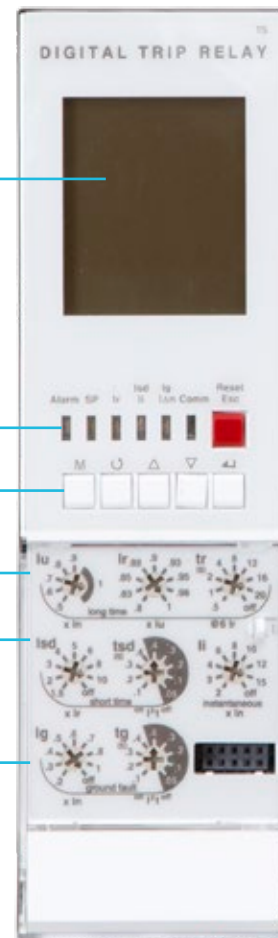
### Navigation keys

Used for navigation through the available menus.

| Key   | Function   |
|---|--|
|  | Menu   |
|  | Moves the cursor or setting right/left             |
|  | Moves the cursor up or increases a setting value   |
|  | Moves the cursor down or decreases a setting value |
|  | Enter  |
|  | Fault reset/ESC from menu                          |

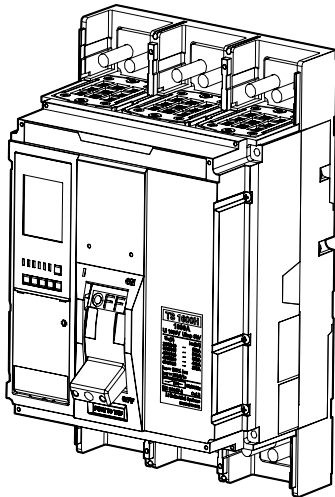
### Adjustment of the protection functions

| Parameter | Function / Setting range  |
|-----------|---|
| lu        | Overload current setting (0.5-0.6-0.7-0.8-0.9-1.0) x In   |
| lr        | Overload current setting (protection function L) (0.8-0.83-0.85-0.88-0.89-0.9-0.93-0.95-0.98-1.0) x In          |
| tr        | Overload tripping delay (0.5-1-2-4-8-12-16-20-OFF) s @ 6xlr   |
| ls        | Timed short-circuit current tripping current (protection function S) (1.5-2-3-4-5-6-7-8-9-10-OFF) x Ir          |
| tsd       | Is current delay I <sup>2</sup> t OFF (0.05-0.1-0.2-0.3-0.4) x Ir<br>I <sup>2</sup> t ON (0.1-0.2-0.3-0.4) x Ir |
| li        | Instantaneous short-circuit tripping current (protection function I) (2-3-4-6-8-10-12-15-OFF) x In              |
| lg        | Ground fault detection current (protection function G) (0.2-0.3-0.4-0.5-0.6-0.7-0.8-1-OFF) x In                 |
| tg        | I <sup>2</sup> t OFF (0.05-0.1-0.2-0.3-0.4)<br>I <sup>2</sup> t ON (0.1-0.2-0.3-0.4)                            |

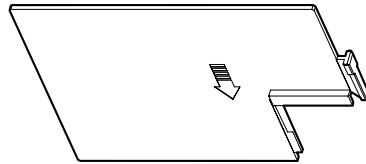


# ACW100/101/160/161/250/400/630/800/1600 standard accessories

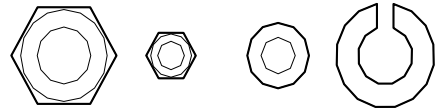
The following mounting, connection, insulation and operating handle accessories come with the three-pole standard to ACW100/101/160/161/250/400/630/800/1600.



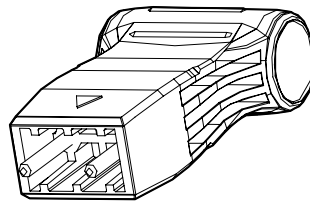
Example: ACW1600 circuit breaker



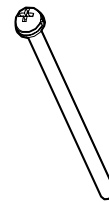
Insulation barrier (phase barrier)  
4 units - ACW100, 101, 160, 101, 250, 400, 630 and 800  
2 units - ACW1600



Nuts and washers (fixation)  
ACW400, 630, 800 and 1600



Auxiliary handle  
(ACW400, 630, 800 and 1600)

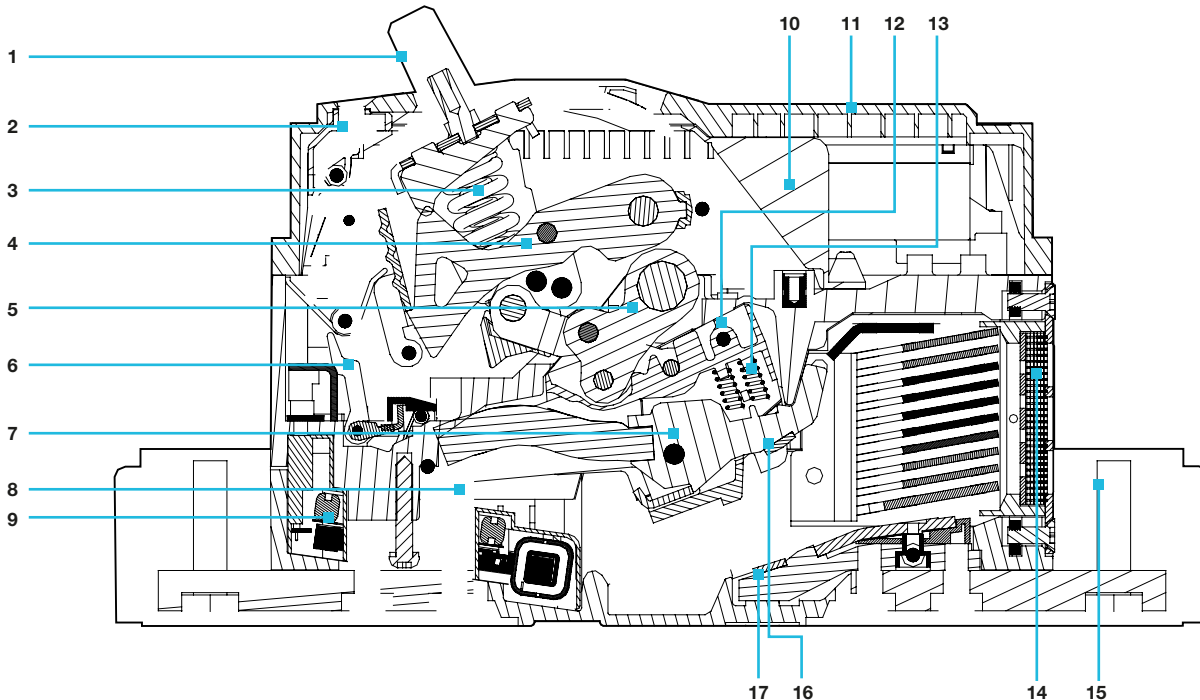


Screws  
(fixation and terminals)



Protective plate  
1 unit - only for ACW1600

## Parts of the circuit breaker

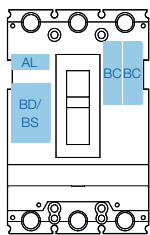


- |                     |                                      |                          |
|---------------------|--------------------------------------|--------------------------|
| 1 - Handle          | 7 - Movable contact                  | 13 - Contact spring      |
| 2 - Test button     | 8 - Output terminal                  | 14 - Arc chute           |
| 3 - Main spring     | 9 - Power supply current transformer | 15 - Terminal screw      |
| 4 - Coupling set    | 10 - Handle protector                | 16 - Movable contact pad |
| 5 - Main shaft set  | 11 - Main cover                      | 17 - Fixed contact pad   |
| 6 - Tripping device | 12 - Contact bracket                 |                          |

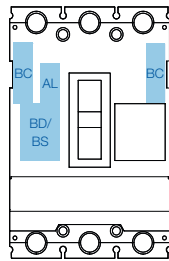
# Internal accessories

## Maximum possible configuration

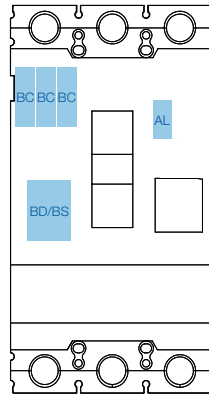
| Internal accessories               | Model         |                      |               |        |         |
|------------------------------------|---------------|----------------------|---------------|--------|---------|
|                                    | ACW100 ACW160 | ACW101 ACW161 ACW250 | ACW400 ACW630 | ACW800 | ACW1600 |
| Alarm auxiliary contact            | 1             | 1                    | 1             | 2      | 1       |
| Auxiliary contact                  | 2             | 2                    | 3             | 3      | 3       |
| Shunt trip or undervoltage release | 1             | 1                    | 1             | 1      | 1       |
| Alarm and auxiliary contact FUAL   | -             | -                    | -             | -      | 1       |



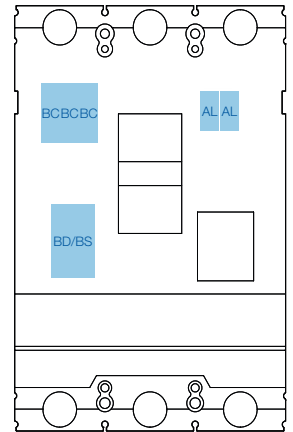
ACW100  
ACW160



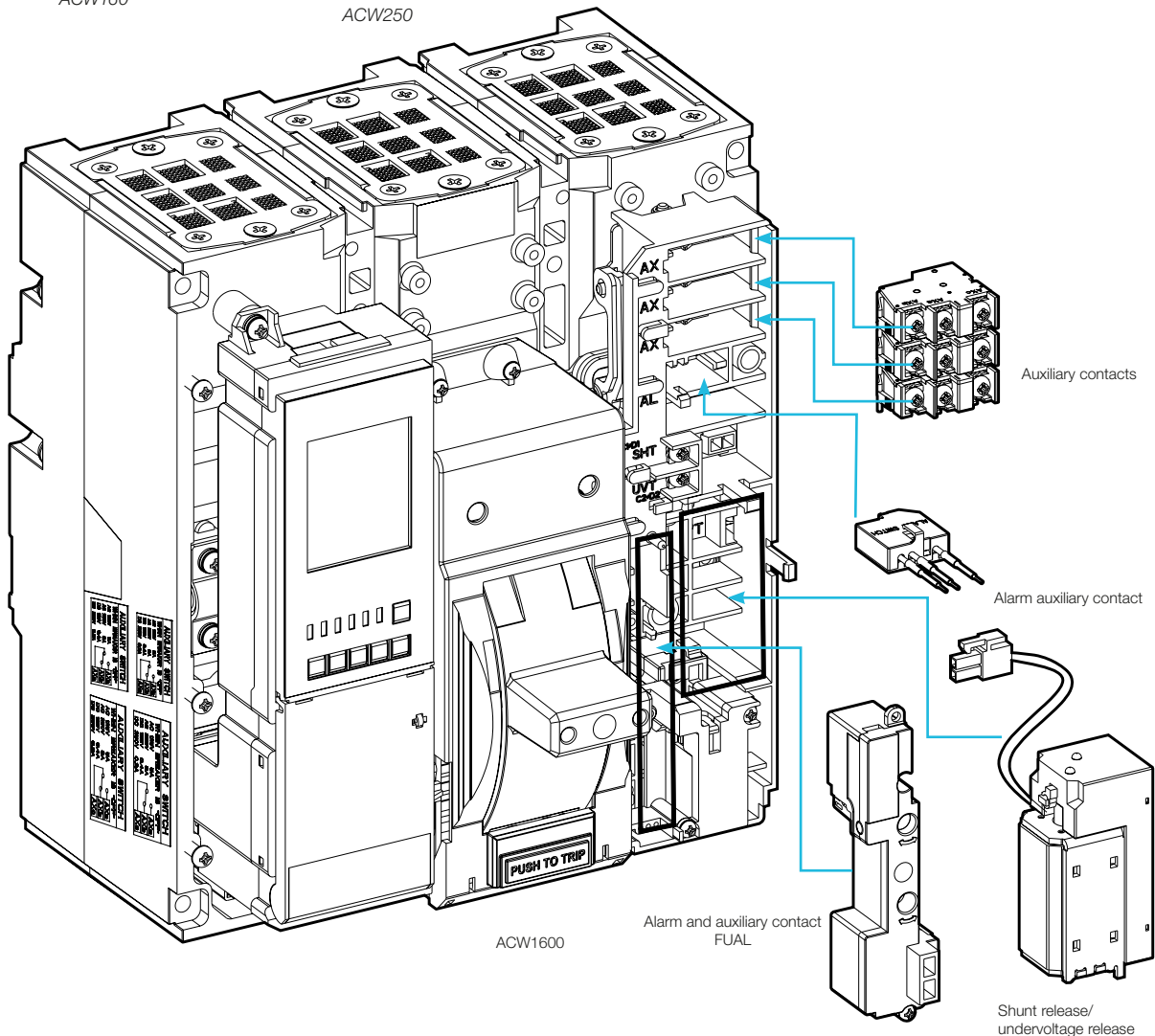
ACW101  
ACW161  
ACW250



ACW400  
ACW630



ACW800



# Internal accessories

## Alarm auxiliary contacts

They offer a signal for TRIP indication on the circuit breaker.



| Circuit breaker model | Reference       | Code     |
|-----------------------|-----------------|----------|
| ACW100...800          | AL-1 ACW100-800 | 10583678 |
| ACW1600               | AL-1 ACW100-800 | 12733490 |
|                       | BL-1 ACW1600    | 12733491 |

| ACW                | ON / OFF | TRIP |
|--------------------|----------|------|
| Alarm contact AL-1 |          |      |

| ACW1600                                | Normal position<br>CB no trip | FAL operation<br>CB trip due to OCR | UAL operation<br>CB trip due to UVT or SHT |
|--|-------------------------------|-------------------------------------|--|
| Indication switch FUAL<br>BL-1 ACW1600 |                               |                                     |  |

FUAL indicates that the breaker has tripped due FAL (overload, short circuit) and UAL (UVT, SHT) separately.

## Auxiliary contact

It has two contacts 1NO + 1NC with a common connection.



| Circuit breaker model | Reference       | Code     |
|-----------------------|-----------------|----------|
| ACW100...800          | BC-1 ACW100-800 | 10583677 |
| ACW1600               | BC-1 ACW1600    | 12733489 |

| ACW                | ON | OFF \ TRIP |
|--------------------|----|------------|
| Alarm contact BC-1 |    |            |

## Auxiliary contacts technical data

| Rated operational current Ie with rated operational voltage Ue | Voltage | Current (Ie) |            | Minimum load current         |
|--|---------|--------------|------------|------------------------------|
|  |         | Resistance   | Inductance |                              |
| Alternating current 50/60 Hz (AC)                              | 125 V   | 5            | 3          | 5 Vdc 160 mA<br>30 Vdc 30 mA |
|  | 250 V   | 3            | 2          |                              |
|  | 500 V   | -            | -          |                              |
| Direct current (DC)  | 30 V    | 4            | 3          |                              |
|  | 125 V   | 0.4          | 0.4        |                              |
|  | 250 V   | 0.2          | 0.2        |                              |

# Internal accessories

## Shunt release

The shunt trip allows turning off the motor by means of an external electrical command.



| Circuit breaker model | Voltage   | Reference         | Code     |
|-----------------------|---|-------------------|----------|
| ACW100...800          | 110 ~ 130 V <sub>AC</sub> / V <sub>DC</sub>     | BD ACW100-800 E10 | 10583679 |
|                       | 200 ~ 240 V <sub>AC</sub> / 250 V <sub>DC</sub> | BD ACW100-800 E44 | 10583680 |
|                       | 24 V <sub>AC</sub> / V <sub>DC</sub>            | BD ACW100-800 E26 | 10692976 |
| ACW1600               | 24 ~ 30 V <sub>DC</sub>                         | BD ACW1600 C28    | 12733492 |
|                       | 48 V <sub>AC</sub> / 48 ~ 60 V <sub>DC</sub>    | BD ACW1600 E58    | 12733494 |
|                       | 110 ~ 130 V <sub>AC</sub> / V <sub>DC</sub>     | BD ACW1600 E10    | 12733495 |
|                       | 200 ~ 240 V <sub>AC</sub> / V <sub>DC</sub>     | BD ACW1600 E12    | 12733496 |
|                       | 380 ~ 460 V <sub>AC</sub>                       | BD ACW1600 D85    | 12733497 |

### Technical characteristics of the shunt release ACW100...800

| Supply voltage                              | Consumption |        |      | Max. opening time (ms) |
|---|-------------|--------|------|------------------------|
|   | AC (VA)     | DC (W) | mA   |                        |
| 110 ~ 130 V <sub>AC</sub> / V <sub>DC</sub> | 1.36        | 1.37   | 10.5 | 50                     |
| 220 ~ 240 V <sub>AC</sub> / V <sub>DC</sub> | 1.80        | 1.88   | 7.5  |                        |
| 24 V <sub>AC</sub> / V <sub>DC</sub>        | 0.58        | 0.58   | 24   |                        |

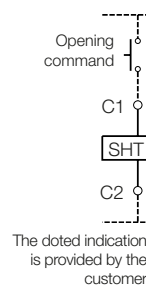
### Technical characteristics of the shunt release ACW1600

#### Rated voltage and characteristic of the shunt trip

| Rated voltage (Vn) |         | Operational voltage range (V) | Consumption (VA or W) |              | Max. opening time (ms) |
|--------------------|---------|-------------------------------|-----------------------|--------------|------------------------|
| DC (V)             | AC (V)  |                               | Energization          | Steady-state |                        |
| 24-30              | -       | 0.6 ~ 1.1 Vn                  | 200                   | 5            | Below 40ms             |
| 48-60              | 48      |                               |                       |              |                        |
| 100-130            | 100-130 | 0.56 ~ 1.1 Vn                 | 200                   | 5            | Below 40ms             |
| 200-250            | 200-250 |                               |                       |              |                        |
| -                  | 380-480 |                               |                       |              |                        |

Note: the operational voltage range is the minimum standard rated voltage for each voltage.

#### Wiring diagram



| Operational voltage | Cable type | Rated voltage (Vn)             |                                |                                |                                |
|---------------------|------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
|                     |            | DC 24-30 (V)                   |                                | DC/AC 48 (V)                   |                                |
|                     |            | 14 AWG (2.08 mm <sup>2</sup> ) | 16 AWG (1.31 mm <sup>2</sup> ) | 14 AWG (2.08 mm <sup>2</sup> ) | 16 AWG (1.31 mm <sup>2</sup> ) |
| 100%                | 100%       | 95.7 m                         | 61 m                           | 457.8 m                        | 287.7 m                        |
| 85%                 | 85%        | 62.5 m                         | 38.4 m                         | 291.7 m                        | 183.2 m                        |

# Internal accessories

## Undervoltage release

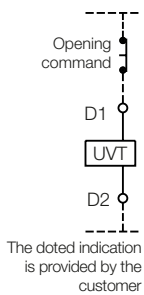
The undervoltage release opens the circuit breaker when the applied potential is below the rated acceptable range. The operation is instantaneous, and, after the release goes into the TRIP state, the circuit breaker can only be closed when the voltage exceeds the rated acceptable voltage range. As follows:



| Circuit breaker model | Voltage   | Reference         | Code     |
|-----------------------|---|-------------------|----------|
| ACW100...800          | 24 V <sub>AC</sub> / V <sub>DC</sub>            | BS ACW100-800 E26 | 10692990 |
|                       | 110 ~ 130 V <sub>AC</sub> / V <sub>DC</sub>     | BS ACW100-800 E10 | 10583681 |
|                       | 200 ~ 240 V <sub>AC</sub> / 250 V <sub>DC</sub> | BS ACW100-800 E44 | 10583660 |
|                       | 380 ~ 400 V <sub>AC</sub>                       | BS ACW100-800 D71 | 10583654 |
|                       | 440 ~ 480 V <sub>AC</sub>                       | BS ACW100-800 D74 | 10583655 |
| ACW1600               | 24 ~ 30 V <sub>DC</sub>                         | BS ACW1600 C28    | 12733528 |
|                       | 48 V <sub>AC</sub> / 48 ~ 60 V <sub>DC</sub>    | BS ACW1600 E58    | 12733529 |
|                       | 110 ~ 130 V <sub>AC</sub> / V <sub>DC</sub>     | BS ACW1600 E10    | 12733530 |
|                       | 200 ~ 240 V <sub>AC</sub> / V <sub>DC</sub>     | BS ACW1600 E12    | 12733531 |
|                       | 380 ~ 460 V <sub>AC</sub>                       | BS ACW1600 D85    | 12733532 |

## Technical characteristics of the undervoltage release ACW100...800

### Wiring diagram



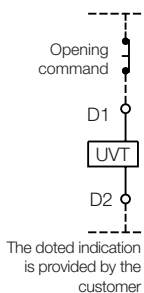
| Supply voltage                              | Consumption |        |     | Max. opening time (ms) |
|---|-------------|--------|-----|------------------------|
|   | AC (VA)     | DC (W) | mA  |                        |
| 110 ~ 130 V <sub>AC</sub> / V <sub>DC</sub> | 0.73        | 0.75   | 5.8 | 50                     |
| 220 ~ 240 V <sub>AC</sub> / V <sub>DC</sub> | 1.21        | 1.35   | 5.4 |                        |
| 380 ~ 440 V <sub>AC</sub>                   | 1.67        | -      | 3.8 |                        |
| 440 ~ 480 V <sub>AC</sub>                   | 1.68        | -      | 3.5 |                        |

## Technical characteristics of the undervoltage release ACW1600

| Rated voltage (V <sub>n</sub> ) |         | Operational voltage range (V) |                           | Consumption (VA or W) |              | Max. opening time (ms) |
|---------------------------------|---------|-------------------------------|---------------------------|-----------------------|--------------|------------------------|
| DC (V)                          | AC (V)  | Operation                     | Dropout                   | Energization          | Steady-state |                        |
| 24-30                           | -       | 0.65 ~ 0.85V <sub>n</sub>     | 0.44 ~ 0.6 V <sub>n</sub> | 200                   | 5            | Below 50ms             |
| 48-60                           | 48      |                               |                           |                       |              |                        |
| 100-130                         | 100-130 |                               |                           |                       |              |                        |
| 200-250                         | 200-250 |                               |                           |                       |              |                        |
| -                               | 380-480 |                               |                           |                       |              |                        |

Note: the operational voltage range is the minimum standard rated voltage for each voltage.

### Wiring diagram



| Operational voltage | Cable type | Rated voltage (V <sub>n</sub> ) |                                |                                |                                |
|---------------------|------------|---------------------------------|--------------------------------|--------------------------------|--------------------------------|
|                     |            | DC 24-30 (V)                    |                                | DC/AC 48 (V)                   |                                |
|                     |            | 14 AWG (2.08 mm <sup>2</sup> )  | 16 AWG (1.31 mm <sup>2</sup> ) | 14 AWG (2.08 mm <sup>2</sup> ) | 16 AWG (1.31 mm <sup>2</sup> ) |
| 100%                | 100%       | 48.5 m                          | 30.5 m                         | 233.2 m                        | 143.9 m                        |
|                     | 85%        | 13.4 m                          | 8.8 m                          | 62.5 m                         | 39.3 m                         |



# External accessories

## Motorized operation

The motor operator is a mechanical and electrical device whose main characteristics are:

- It allows remote operation of the circuit breaker
- Option of manual or automatic operation. Operation selection from the front of the motor operator
- Motor operator with direct operation on the circuit breaker handle



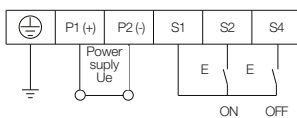
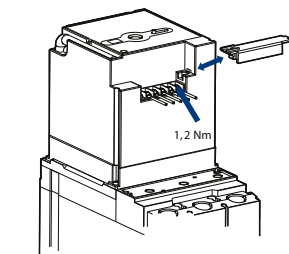
### For MANUAL operation, it is necessary:

- 1 - Set the sliding switch to MANUAL.
- 2 - Insert the operating handle (located on the side bracket) into the front slot and rotate it 180° clockwise. Rotated only 180° to ensure the operation of the internal micro switch.
- 3 - Put the handle back on the side bracket.

### For AUTOMATIC operation, it is necessary:

- 1 - Set the sliding switch to AUTO. In this position it is possible to operate the circuit breaker remotely by sending ON/OFF signals.
- 2 - Please, do not send ON/OFF signals at the same time during automatic operation.
- 3 - If the circuit breaker is equipped with undervoltage release, please charge it before operating the motor operator.

## Technical data



| Reference         | Circuit breaker            | Control voltage                                       | Response time (ms) |         | Consumption (W) | Operations per hour | Code     |
|-------------------|----------------------------|---|--------------------|---------|-----------------|---------------------|----------|
|                   |                            |   | Closing            | Opening |                 |                     |          |
| AM ACW100-160 E36 | ACW100                     | 100 ~ 240 V <sub>AC</sub> / 110 ~ 220 V <sub>DC</sub> | 310                | 200     | 14              | 120                 | 10583656 |
| AM ACW100-160 C03 | ACW160                     | 24 V <sub>DC</sub>                                    | 310                | 200     | 14              | 120                 | 10692992 |
| AM ACW250 E29     | ACW101<br>ACW161<br>ACW250 | 110 V <sub>AC</sub> / V <sub>DC</sub>                 | 350                | 230     | 14              | 120                 | 10583657 |
| AM ACW250 E46     |                            | 230 V <sub>AC</sub> / 220 V <sub>DC</sub>             | 350                | 230     | 14              | 120                 | 10583658 |
| AM ACW250 C03     |                            | 24 V <sub>DC</sub>                                    | 350                | 230     | 14              | 120                 | 10692993 |
| AM ACW250 C13     |                            | 125 V <sub>DC</sub>                                   | 350                | 230     | 14              | 120                 | 15599870 |
| AM ACW400-630 E29 | ACW400<br>ACW630           | 110 V <sub>AC</sub> / V <sub>DC</sub>                 | 500                | 350     | 35              | 60                  | 10583659 |
| AM ACW400-630 E46 |                            | 230 V <sub>AC</sub> / 220 V <sub>DC</sub>             | 500                | 350     | 35              | 60                  | 10583661 |
| AM ACW400-630 C03 |                            | 24 V <sub>DC</sub>                                    | 500                | 350     | 35              | 60                  | 10692994 |
| AM ACW630 C13     |                            | 125 V <sub>DC</sub>                                   | 500                | 350     | 35              | 60                  | 15599872 |
| AM ACW800 E29     | ACW800                     | 110 V <sub>AC</sub> / V <sub>DC</sub>                 | 700                | 420     | 35              | 20                  | 10583662 |
| AM ACW800 E46     |                            | 230 V <sub>AC</sub> / 220 V <sub>DC</sub>             | 700                | 420     | 35              | 20                  | 10583663 |
| AM ACW800 C03     |                            | 24 V <sub>DC</sub>                                    | 700                | 420     | 35              | 20                  | 10692995 |
| AM ACW800 C13     |                            | 125 V <sub>DC</sub>                                   | 700                | 420     | 35              | 20                  | 15599874 |

Control voltage tolerance: versions starting at 100 V: -15% or +10%. 24 V versions: -5% or +10%.

## Rotary operating handle coupled to the circuit breaker ACW100...800

- Installed directly in front of the circuit breaker on panel door
- It only allows opening the panel door with the circuit breaker OFF
- It allows the use of padlocks (up to 3 padlocks)
- Thermometry function (operator can use the handle to open the panel door in the ON position)
- Degree of protection IP40
- Comes with finishing frame for panel door



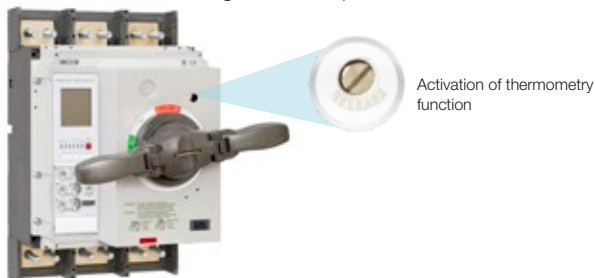
Activation of the thermometry function

| Circuit breaker        | Reference      | Code     |
|------------------------|----------------|----------|
| ACW100, ACW160         | MRI ACW100-160 | 10583652 |
| ACW101, ACW161, ACW250 | MRI ACW250     | 10583653 |
| ACW400, ACW630         | MRI ACW400-630 | 10583903 |
| ACW800                 | MRI ACW800     | 10583904 |

## External accessories

### Rotary operating handle coupled to the circuit breaker ACW1600

- Installed directly in front of the circuit breaker on panel door
- It only allows opening the panel door with the circuit breaker OFF
- It allows the use of padlocks (up to 3 padlocks)
- Thermometry function (operator can use the handle to open the panel door in the ON position)
- Degree of protection IP40
- Comes with finishing frame for panel door



| Circuit breaker | Reference   | Code     |
|-----------------|-------------|----------|
| ACW1600         | MRK ACW1600 | 12733533 |

### Rotary operating handle coupled to the circuit ACW100...800 With key lock

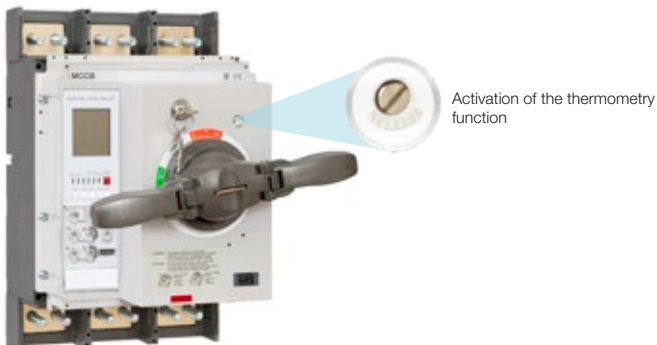
- Installed directly in front of the circuit breaker on panel door
- It only allows opening the panel door with the circuit breaker OFF
- It allows locking the handle with a key
- Thermometry function (operator can use the handle to open the panel door in the ON position)
- Degree of protection IP40
- Comes with finishing frame for panel door



| Circuit breaker        | Reference      | Code     |
|------------------------|----------------|----------|
| ACW100, ACW160         | MRK ACW100-160 | 12430245 |
| ACW101, ACW161, ACW250 | MRK ACW250     | 12430246 |
| ACW400, ACW630         | MRK ACW400-630 | 12430247 |
| ACW800                 | MRK ACW800     | 12430298 |

### Rotary operating handle coupled to the circuit breaker ACW1600 with key lock

- Installed directly in front of the circuit breaker on panel door
- It allows locking the handle with a key
- Thermometry function (operator can use the handle to open the panel door in the ON position)
- Degree of protection IP40
- Comes with finishing frame for panel door



| Circuit breaker | Reference   | Code     |
|-----------------|-------------|----------|
| ACW1600         | MRK ACW1600 | 12733534 |

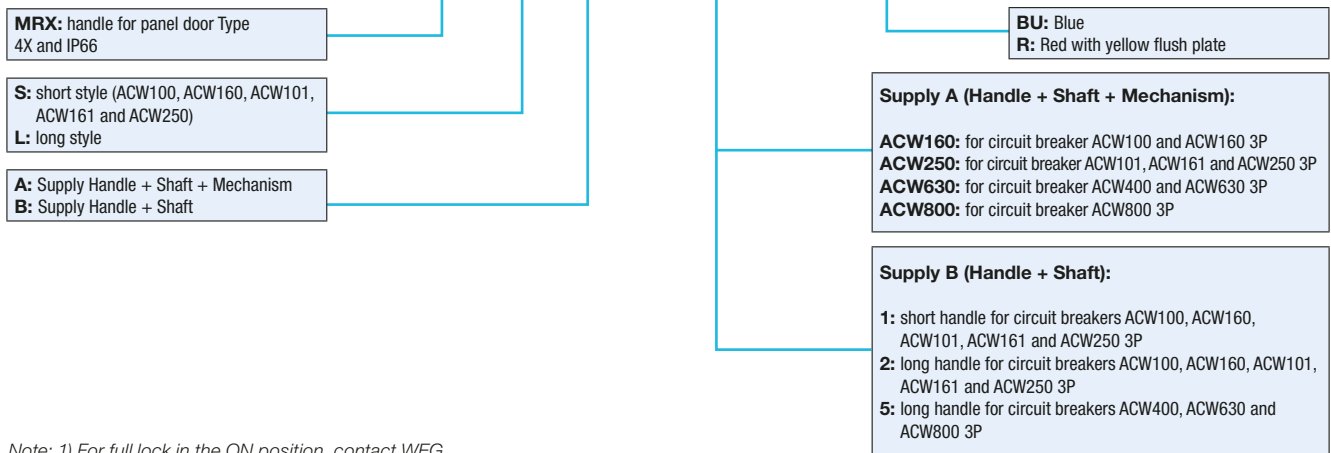
# External accessories

## Rotary drive for panel door (handle IP66)

### ACW100 ... ACW800

- Handles only allows opening the panel door with the circuit breaker OFF. The door can be opened with the circuit breaker ON if the operator releases the handle safety lock (thermometry).
- Total locking (circuit breaker + panel door) in the OFF position with up to three padlocks<sup>1)</sup>.

### MRX S - A - ACW160 - BU



Note: 1) For full lock in the ON position, contact WEG.

### Supply A: handle + shaft + mechanism

| Ref. WEG | Description      | Circuit breaker             | Shaft (mm) | Length of the handle (mm) | Handle color                |
|----------|------------------|-----------------------------|------------|---------------------------|-----------------------------|
| 13624662 | MRXS-A-ACW160-R  | ACW100 / ACW160 3P          | 460        | -                         | Red with yellow flush plate |
| 13993766 | MRXS-A-ACW250-R  | ACW101 / ACW161 / ACW250 3P | 460        | -                         | Red with yellow flush plate |
| 13993849 | MRXL-A-ACW160-R  | ACW100 / ACW160 3P          | 460        | 105                       | Red with yellow flush plate |
| 13993870 | MRXL-A-ACW250-R  | ACW101 / ACW161 / ACW250 3P | 460        | 105                       | Red with yellow flush plate |
| 13993928 | MRXL-A-ACW630-R  | ACW400 / ACW630 3P          | 460        | 158                       | Red with yellow flush plate |
| 13993930 | MRXL-A-ACW800-R  | ACW800 3P                   | 460        | 158                       | Red with yellow flush plate |
| 13624663 | MRXS-A-ACW160-BU | ACW100 / ACW160 3P          | 460        | -                         | Blue                        |
| 13993764 | MRXS-A-ACW250-BU | ACW101 / ACW161 / ACW250 3P | 460        | -                         | Blue                        |
| 13993848 | MRXL-A-ACW160-BU | ACW100 / ACW160 3P          | 460        | 105                       | Blue                        |
| 13993853 | MRXL-A-ACW250-BU | ACW101 / ACW161 / ACW250 3P | 460        | 105                       | Blue                        |
| 13993877 | MRXL-A-ACW630-BU | ACW400 / ACW630 3P          | 460        | 158                       | Blue                        |
| 13993929 | MRXL-A-ACW800-BU | ACW800 3P                   | 460        | 158                       | Blue                        |

Notes: 1) 4...8 mm padlocks may be fit to the handles.  
2) Sold separately only. It is not sold assembled on the circuit breaker.

### Supply B: handle + shaft

| Ref. WEG | Description  | Circuit breaker                               | Shaft (mm) | Length of the handle (mm) | Handle color                |
|----------|--------------|---|------------|---------------------------|-----------------------------|
| 14346047 | MRXS-B-13-R  | ACW100 / ACW160 / ACW101 / ACW161 / ACW250 3P | 460        | -                         | Red with yellow flush plate |
| 14346105 | MRXL-B-14-R  | ACW100 / ACW160 / ACW101 / ACW161 / ACW250 3P | 460        | 105                       | Red with yellow flush plate |
| 13624637 | MRXL-B-5-R   | ACW400 / ACW630 / ACW800 3P                   | 460        | 158                       | Red with yellow flush plate |
| 14346104 | MRXS-B-13-BU | ACW100 / ACW160 / ACW101 / ACW161 / ACW250 3P | 460        | -                         | Blue                        |
| 14346106 | MRXL-B-14-BU | ACW100 / ACW160 / ACW101 / ACW161 / ACW250 3P | 460        | 105                       | Blue                        |
| 13624659 | MRXL-B-5-BU  | ACW400 / ACW630 / ACW800 3P                   | 460        | 158                       | Blue                        |

Notes: 1) 4...8 mm padlocks may be fit to the handles.  
2) Sold separately only. It is not sold assembled on the circuit breaker.

## External accessories

### Rotary drive for panel door (handle IP66)

#### ACW100 ... ACW800

##### Only mechanism

| Ref. WEG | Description | Circuit breaker             |
|----------|-------------|-----------------------------|
| 11591602 | MRH ACW160  | ACW100 / ACW160 3P          |
| 11591601 | MRH ACW250  | ACW101 / ACW161 / ACW250 3P |
| 11591599 | MRH ACW630  | ACW400 / ACW630 3P          |
| 11591598 | MRH ACW800  | ACW800 3P                   |

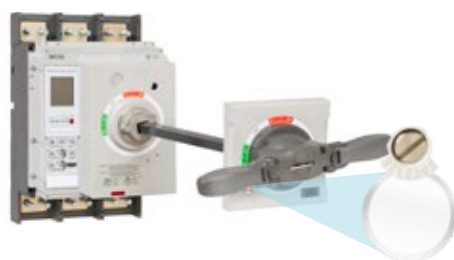
Note: sold separately only. It is not sold assembled on the circuit breaker.

### Rotary drive for panel door - ACW1600 (handle IP55)

#### ACW1600

##### Supply: handle + shaft + mechanism

- Installed on panel door
- It only allows opening the panel door with the circuit breaker OFF
- It allows the use of padlocks (up to 3 padlocks) so much ON position and OFF position
- Thermometry function (operator can use the handle to open the panel door in the ON position)



Activation of thermometry function

| Circuit breaker | Reference     | Code     |
|-----------------|---------------|----------|
| ACW1600         | MR469 ACW1600 | 12733535 |

### Extension bar

- It increases the terminal length and ensures greater isolation distance between them<sup>1)</sup>
- Set with 3 pieces



| Circuit breaker        | Reference     | Code                   |
|------------------------|---------------|------------------------|
| ACW100, ACW160         | BE-ACW100-160 | 10583665 <sup>2)</sup> |
| ACW101, ACW161, ACW250 | BE-ACW250     | 10583666 <sup>2)</sup> |
| ACW400, ACW630         | BE-ACW400-630 | 10583667               |
| ACW800                 | BE-ACW800     | 10583664               |



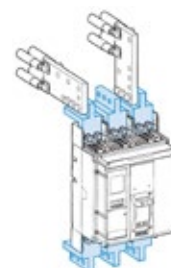
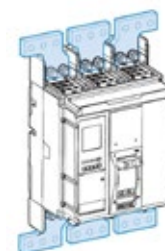
| Circuit breaker | Reference  | Code     |
|-----------------|------------|----------|
| ACW1600         | BE-ACW1600 | 12733549 |



| Circuit breaker | Reference   | Code     |
|-----------------|-------------|----------|
| ACW1600         | BEV-ACW1600 | 12733550 |



| Circuit breaker | Reference   | Code     |
|-----------------|-------------|----------|
| ACW1600         | BER-ACW1600 | 12733551 |



Notes: 1) It is recommended to use insulating plate when extension bar is used. Accessory not supplied by WEG.  
2) Standard supply includes phase barrier.

# External accessories

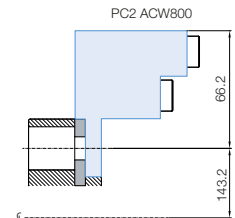
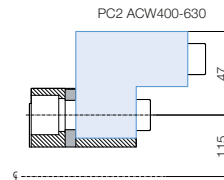
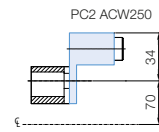
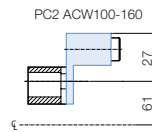
## Cable gland

### ACW100...800

- They can be used for copper cables or busbars or aluminum cables
- Set with 3 pieces



| Circuit breaker        | Reference      | Code     |
|------------------------|----------------|----------|
| ACW100, ACW160         | PC2 ACW100-160 | 10583668 |
| ACW101, ACW161, ACW250 | PC2 ACW250     | 10583669 |
| ACW400, ACW630         | PC2 ACW400-630 | 10583671 |
| ACW800                 | PC2 ACW800     | 10583672 |








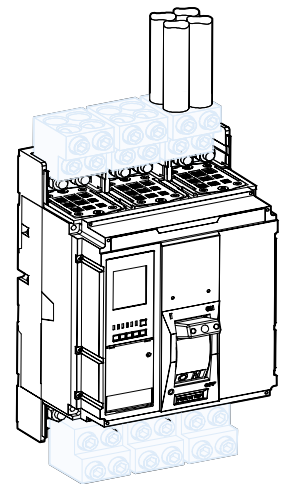
### ACW1600

They can be used to connect 85...240 mm<sup>2</sup> copper or aluminium cables.



| Circuit breaker | Reference   | Code     |
|-----------------|-------------|----------|
| ACW1600         | PC2 ACW1600 | 12733552 |

|                                    | ACW100 / ACW160   | ACW101 / ACW161 / ACW250  | ACW400 / ACW630   | ACW800  | ACW1600   |
|------------------------------------|---|---|---|---|---|
|                                    |  |  |  |  |  |
| Number of cables                   | 1   | 1   | 2   | 3   | 4   |
| Maximum section (mm <sup>2</sup> ) | 95  | 150   | 240   | 240   | 240   |
| Minimum section (mm <sup>2</sup> ) | 16  | 16  | 85  | 85  | 85  |
| Tightening torque (kgf.cm)         | 306   | 306   | 367 ~ 428   | 367 ~ 428   | 564   |
| Tightening torque (N.m)            | 30  | 30  | 35.99 ~ 41.97   | 35.99 ~ 41.97   | 55.31   |



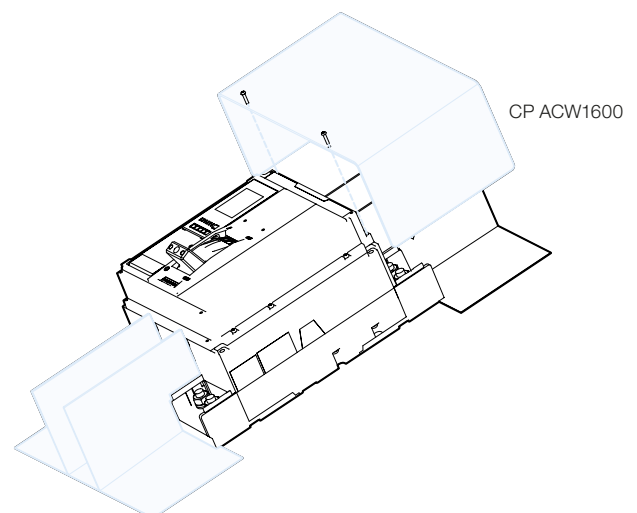
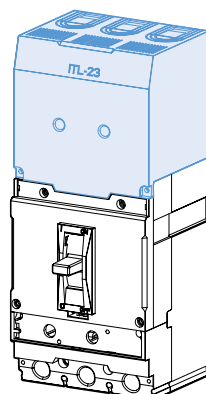
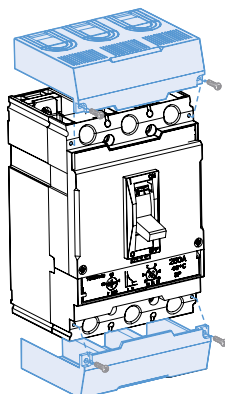
## Terminal protection cover

- It prevents inadvertent contact of the live parts with the circuit breaker



| Circuit breaker        | Reference     | Code                   |
|------------------------|---------------|------------------------|
| ACW100, ACW160         | CP ACW100-160 | 10583673 <sup>1)</sup> |
| ACW101, ACW161, ACW250 | CP ACW250     | 10583674 <sup>1)</sup> |
| ACW400, ACW630         | CP ACW400-630 | 10583675 <sup>1)</sup> |
| ACW800                 | CP ACW800     | 10583676 <sup>1)</sup> |

| Circuit breaker | Reference  | Code                   |
|-----------------|------------|------------------------|
| ACW1600         | CP ACW1600 | 12733553 <sup>1)</sup> |



Note: 1) Standard supply includes e units.

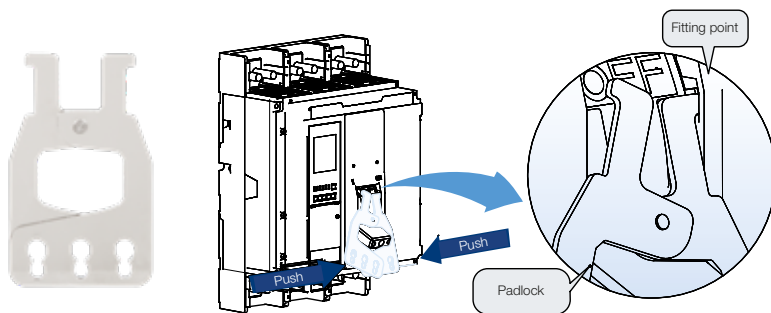
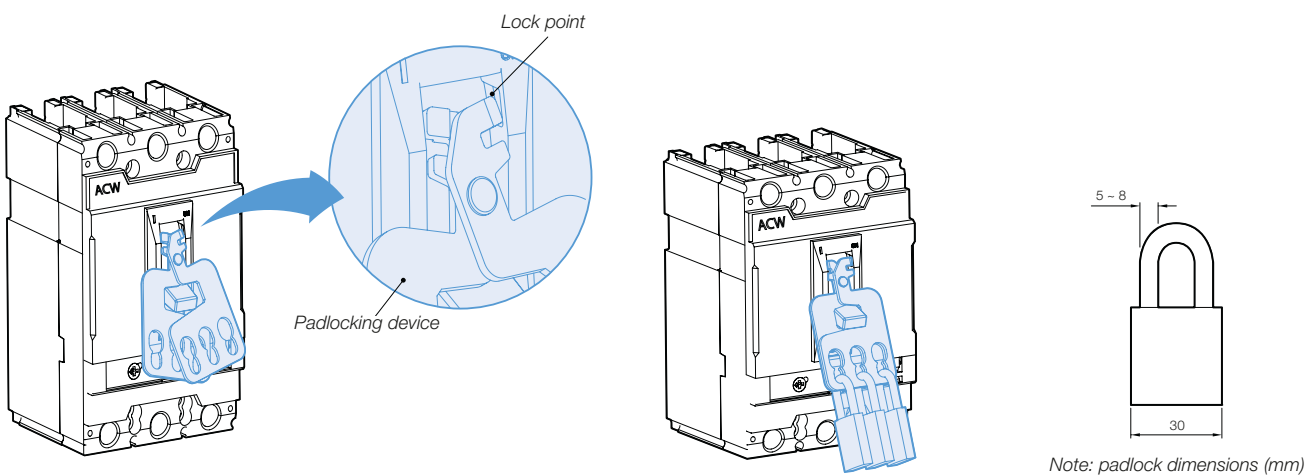
# External accessories

## Padlocking device

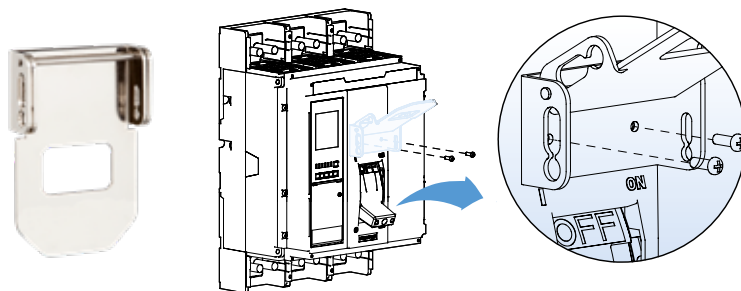
- It allows the circuit breaker to be locked in the off position
- It allows the use of up to three (3) padlocks with diameters from 5 to 8 millimeters (padlocks are not supplied)



| Circuit breaker        | Reference     | Code     |
|------------------------|---------------|----------|
| ACW100, ACW160         | TR ACW100-160 | 10583648 |
| ACW101, ACW161, ACW250 | TR ACW250     | 10583649 |
| ACW400, ACW630         | TR ACW400-630 | 10583650 |
| ACW800                 | TR ACW800     | 10583651 |



| Circuit breaker | Reference  | Code     |
|-----------------|------------|----------|
| ACW1600         | TR ACW1600 | 12733536 |



| Circuit breaker | Reference   | Code     |
|-----------------|-------------|----------|
| ACW1600         | TRI ACW1600 | 12733537 |

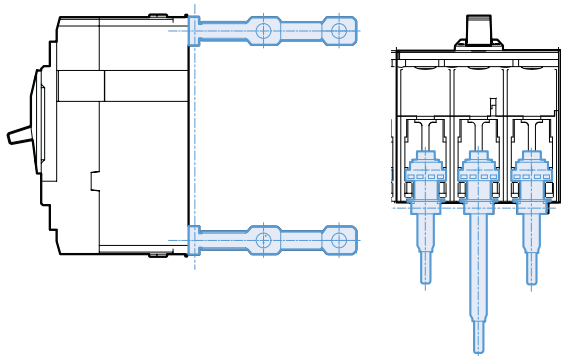
# External accessories

## Rear connection

The rear connection terminals are used to adapt the circuit breakers that require rear connection. Directly connected to the circuit breakers without any modification to them.

They are divided into two types:

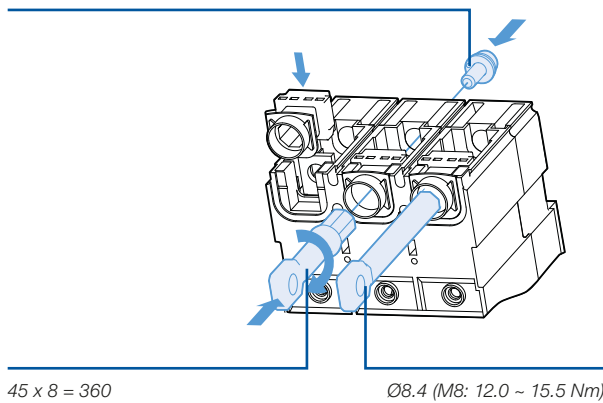
### Straight connection



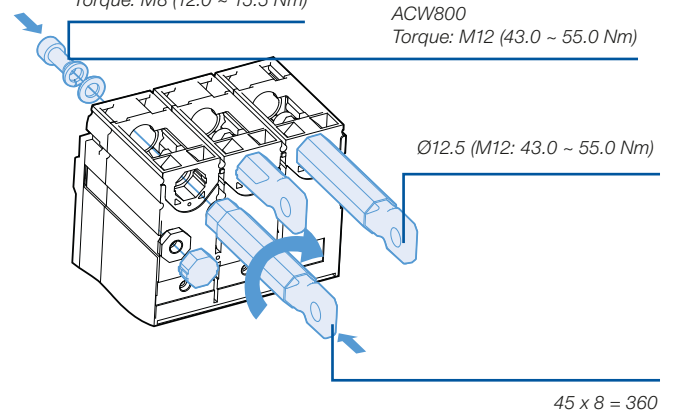
| Circuit breaker        | Reference      | Code     |
|------------------------|----------------|----------|
| ACW100, ACW160         | TTF ACW100-160 | 11591643 |
| ACW101, ACW161, ACW250 | TTF ACW250     | 11591645 |
| ACW400, ACW630         | TTF ACW400-630 | 11591647 |
| ACW800                 | TTF ACW800     | 11591658 |

Note: set supplied with 6 pieces (input/output terminals for three-pole circuit breakers).

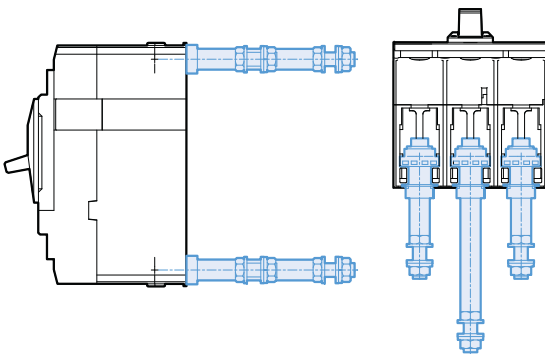
ACW100, ACW160, ACW101, ACW161, ACW250  
Torque: M6 (5.0 ~ 6.5 Nm)



ACW400, ACW630  
Torque: M8 (12.0 ~ 15.5 Nm)



### Round connection



| Circuit breaker        | Reference      | Code     |
|------------------------|----------------|----------|
| ACW100, ACW160         | TTR ACW100-160 | 11591644 |
| ACW101, ACW161, ACW250 | TTR ACW250     | 11591646 |

Note: set supplied with 6 pieces (input/output terminals for three-pole circuit breakers).

# External accessories

## Mechanical interlock

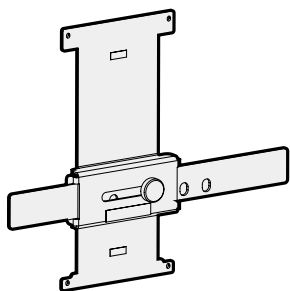
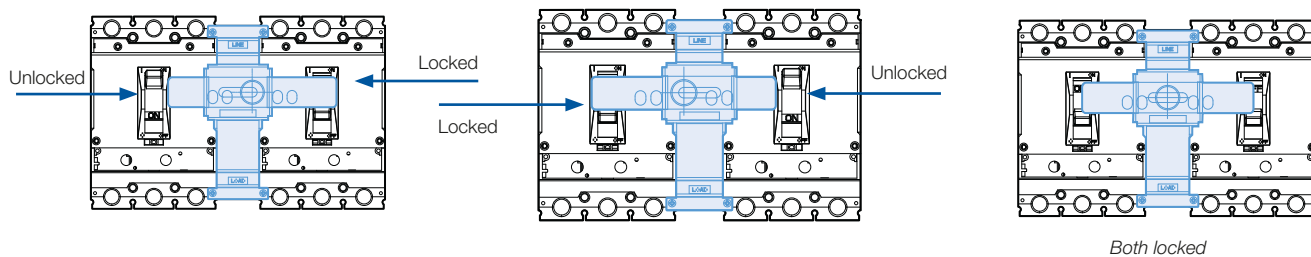
The mechanical interlock occurs in the front part of two circuit breakers assembled side by side, preventing their simultaneous operation.

The mounting is made directly on the cover of the circuit breakers.

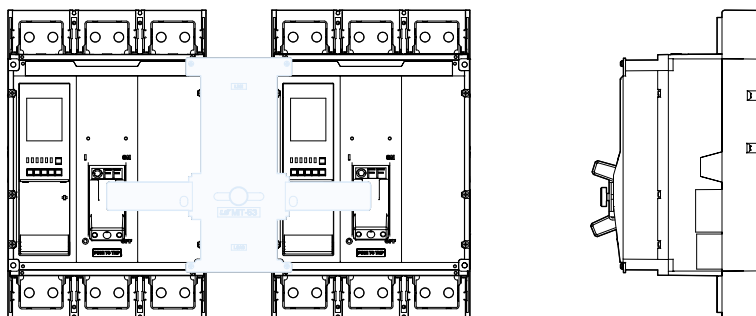
The front interlock plate allows the installation of a padlock in order to lock the position (it is also possible the padlocking in the OFF - OFF position).



| Circuit breaker        | Reference     | Code     |
|------------------------|---------------|----------|
| ACW100, ACW160         | MI ACW100-160 | 11799916 |
| ACW101, ACW161, ACW250 | MI ACW250     | 11799917 |
| ACW400, ACW630         | MI ACW400-630 | 11800018 |
| ACW800                 | MI ACW800     | 11800019 |



| Circuit breaker | Reference  | Code     |
|-----------------|------------|----------|
| ACW1600         | MI ACW1600 | 12733548 |





# External accessories

## Plug-in kit

Directly installed on mounting plate, DIN rail or panel door.

The circuit breaker is connected to the base by means of rear terminals.

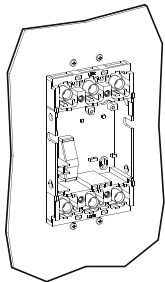
It is possible to extract and/or replace the circuit breaker quickly without touching the connections.

The kit includes rear terminals for fixation to the plug-in base.

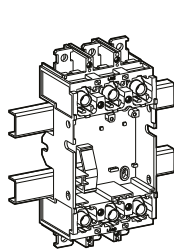


| Circuit breaker        | Reference     | Code     |
|------------------------|---------------|----------|
| ACW100, ACW160         | PI ACW100-160 | 11111776 |
| ACW101, ACW161, ACW250 | PI ACW250     | 11111777 |
| ACW400, ACW600         | PI ACW400-630 | 11111841 |
| ACW800                 | PI ACW800     | 11111843 |

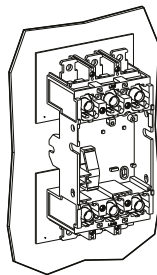
### Front view



Panel door

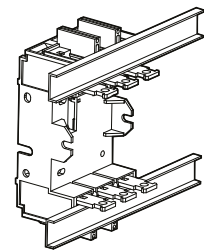
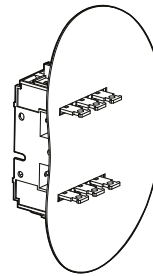


DIN rail

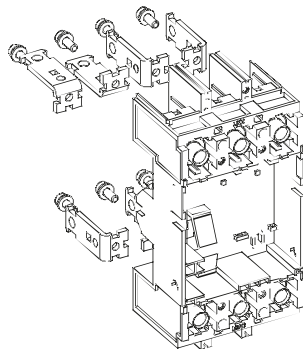
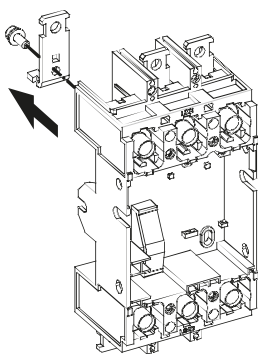


Mounting plate

### Rear view



### Terminal positioning



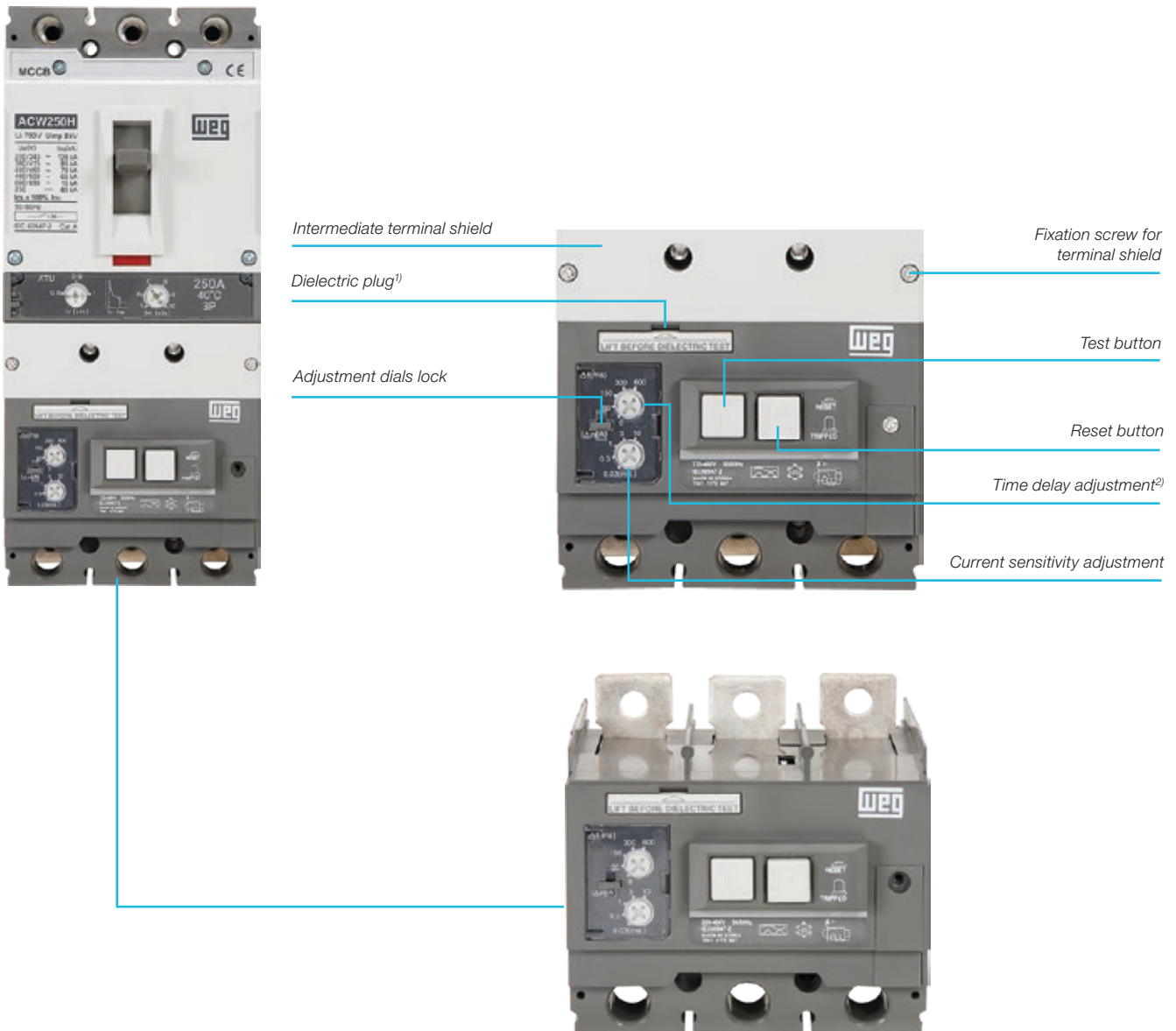
# External accessories

## Earth leakage unit

Directly connected to the circuit breaker without using any secondary connection or wiring. In addition to the protection of the circuit breaker against short-circuit and overload, the Earth leakage unit also ensures protection against direct and indirect contact and fire risk (ELCB). The Earth leakage unit has innumerable time and current configurations. The Earth leakage button tests the electrical and mechanical operation of the device. The unit has the dielectric test button in order to allow the test without damaging the electronic parts.

## Standards

- IEC 60947-2 (industrial)
- IEC 61009 (home)
- IEC 60755, class A, immunity to DC components up to 6 mA
- VDE664 operation down to -25 °C



Notes: 1) Lift this plug before the dielectric test.  
 2) If the current sensitivity is set to 30 mA, there is no time delay, regardless the time delay adjusted.

# External accessories

## Earth leakage unit

| Applicable circuit breaker   | Reference                     | Voltages                           |                                 |
|------------------------------|-------------------------------|------------------------------------|---------------------------------|
|                              |                               | 220 ~ 460 V <sub>AC</sub> (D88)    | 460 ~ 690 V <sub>AC</sub> (D89) |
| ACW101, ACW161 <sup>1)</sup> | FT ACW101-161                 | 11424574                           | 11591541                        |
| ACW250                       | FT ACW250                     | 11424575                           | 11591542                        |
| ACW400                       | FT ACW400                     | 11424577                           | 11591544                        |
| ACW630                       | FT ACW630                     | 11424598                           | 11591546                        |
| ACW800                       | FT ACW800                     | 11424567                           | 11591547                        |
| Protection characteristics   |                               |                                    |                                 |
| Sensitiveness                | $I_{\Delta n}$ (A)            | (adjustable)<br>0,03-0,3-1-3-10    |                                 |
| Time delay <sup>1)2)</sup>   | International time delay (ms) | (adjustable)<br>0-60-150-300-600   |                                 |
|                              | Maximum tripping time (ms)    | (adjustable)<br>40-140-240-450-880 |                                 |
| Rated voltage                | AC 50/60 Hz                   | 220 ~ 460 V                        | 460 ~ 690 V                     |

Notes: 1) For circuit breakers with MTU tripping devices, available at currents  $\geq 100$  A only.  
2) Adjusting the sensitiveness at 30 mA, the tripping is instantaneous, regardless the adjusted time delay.

Adjustment of the tripping time delay  
0-60-150-300-600ms

Adjustment of sensitiveness,  $I_{\Delta n}$   
0,03-0,3-1-3-10 A



## Phase insulators

| Circuit breaker | Reference            | Code     |
|-----------------|----------------------|----------|
| ACW1600         | ISOLADOR BI ACW1600  | 12733555 |
|                 | ISOLADOR BIE ACW1600 | 12733556 |
|                 | ISOLADOR PP ACW1600  | 12733557 |

They allow increasing the insulation degree between phases of the same circuit breaker or between circuit breakers.

### INSULATOR BI ACW1600

Package contains two units (for use in front connection in combination with BE-ACW1600 or in direct connections to the front terminals)



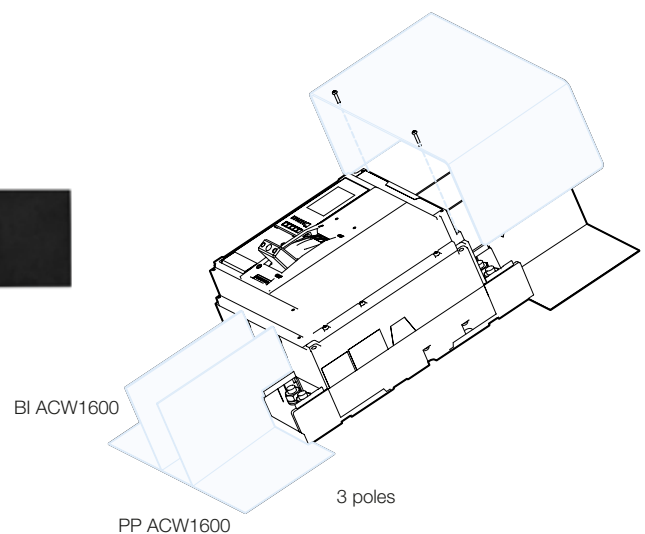
### INSULATOR BIE ACW1600

Package contains two units (for use in rear connection in combination with BEV-ACW1600)



### INSULATOR PP ACW1600

Package contains one unit (insulating plate for installation on the circuit breaker mounting plate)



## Watt loss/ohmic resistance

| Current (A) | ACW100 |      |       |      |       |       |       |       | ACW160 |       |       | ACW101, ACW161 |       |       | ACW250 |       | ACW400 | ACW630 | ACW800 | ACW1600 |
|-------------|--------|------|-------|------|-------|-------|-------|-------|--------|-------|-------|----------------|-------|-------|--------|-------|--------|--------|--------|---------|
|             | 20     | 25   | 32    | 40   | 50    | 63    | 80    | 100   | 100    | 125   | 160   | 50             | 100   | 160   | 200    | 250   | 400    | 630    | 800    | 1,600   |
| R (mΩ)      | 5.60   | 3.80 | 3.80  | 1.84 | 1.34  | 1.10  | 0.91  | 0.70  | 0.70   | 0.61  | 0.50  | 2.86           | 0.96  | 0.62  | 0.52   | 0.25  | 0.30   | 0.21   | 0.12   | 0.027   |
| W/pole      | 2.24   | 2.38 | 3.89  | 2.94 | 3.35  | 4.37  | 5.82  | 7.00  | 7.00   | 9.53  | 12.80 | 7.15           | 9.60  | 15.87 | 20.80  | 15.79 | 47.68  | 83.35  | 73.81  | 76.0    |
| W/3 poles   | 6.72   | 7.13 | 11.67 | 8.83 | 10.05 | 13.10 | 17.47 | 21.00 | 21.00  | 28.59 | 38.40 | 21.45          | 28.80 | 47.62 | 62.40  | 47.38 | 143.04 | 250.05 | 221.44 | 228.1   |

## Rated current derating due to temperature rise

The rated current classification of the thermomagnetic ACW molded case circuit breakers must be considered according to variations in ambient temperature. Circuit breakers with electronic protection units are not affected by temperature variations.

Connection: Standard  
 Type trigger: FMU; ATU;  
 Short-circuit breaking: H or V

| Modelo ACW | Rated current (A) | Thermomagnetic MCCB - FMU and ATU |       |       |       |       |       |       |       |
|------------|-------------------|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|
|            |                   | 10 °C                             | 20 °C | 30 °C | 40 °C | 45 °C | 50 °C | 60 °C | 70 °C |
| ACW100     | 16                | 16                                | 16    | 16    | 16    | 16    | 15    | 14    | 13    |
|            | 20                | 20                                | 20    | 20    | 20    | 19    | 19    | 18    | 16    |
|            | 25                | 25                                | 25    | 25    | 25    | 24    | 23    | 22    | 21    |
|            | 32                | 32                                | 32    | 32    | 32    | 31    | 30    | 28    | 26    |
|            | 40                | 40                                | 40    | 40    | 40    | 39    | 38    | 35    | 33    |
|            | 50                | 50                                | 50    | 50    | 50    | 48    | 47    | 44    | 41    |
|            | 63                | 63                                | 63    | 63    | 63    | 61    | 59    | 56    | 52    |
|            | 80                | 80                                | 80    | 80    | 80    | 78    | 75    | 71    | 66    |
| ACW160     | 100               | 100                               | 100   | 100   | 100   | 97    | 94    | 88    | 82    |
|            | 125               | 125                               | 125   | 125   | 125   | 121   | 117   | 110   | 103   |
| ACW250     | 160               | 160                               | 160   | 160   | 160   | 155   | 150   | 141   | 131   |
|            | 200               | 200                               | 200   | 200   | 200   | 194   | 188   | 176   | 164   |
|            | 250               | 250                               | 250   | 250   | 250   | 242   | 234   | 220   | 205   |

Connection Plug-in  
 Type trigger: FMU; ATU;  
 Short-circuit breaking: H or V

| Circuit breaker | Rated current (A) | Thermomagnetic MCCB - FMU and ATU |       |       |       |       |       |       |       |
|-----------------|-------------------|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|
|                 |                   | 10 °C                             | 20 °C | 30 °C | 40 °C | 45 °C | 50 °C | 60 °C | 70 °C |
| ACW100          | 16                | 16                                | 16    | 16    | 16    | 16    | 15    | 14    | 13    |
|                 | 20                | 20                                | 20    | 20    | 20    | 19    | 19    | 18    | 16    |
|                 | 25                | 25                                | 25    | 25    | 25    | 24    | 23    | 22    | 21    |
|                 | 32                | 32                                | 32    | 32    | 32    | 31    | 30    | 28    | 26    |
|                 | 40                | 40                                | 40    | 40    | 40    | 39    | 38    | 35    | 33    |
|                 | 50                | 50                                | 50    | 50    | 50    | 48    | 47    | 44    | 41    |
|                 | 63                | 63                                | 63    | 63    | 63    | 61    | 59    | 56    | 52    |
|                 | 80                | 80                                | 80    | 80    | 80    | 78    | 75    | 71    | 66    |
| ACW160          | 100               | 100                               | 100   | 100   | 100   | 97    | 94    | 88    | 82    |
|                 | 125               | 125                               | 125   | 125   | 125   | 121   | 117   | 110   | 103   |
| ACW250          | 144               | 144                               | 144   | 144   | 144   | 140   | 135   | 127   | 118   |
|                 | 200               | 200                               | 200   | 200   | 200   | 194   | 194   | 176   | 164   |
|                 | 250               | 235                               | 235   | 235   | 235   | 228   | 228   | 207   | 193   |

## Rated current derating due to temperature rise

### Rated currents for ACW1600 circuit breakers installed in electrical panels

| Circuit breaker | Rated current (A) | Front / horizontal connection output |       |       |       |       |       |       |
|-----------------|-------------------|--------------------------------------|-------|-------|-------|-------|-------|-------|
|                 |                   | 40 °C                                | 45 °C | 50 °C | 55 °C | 60 °C | 65 °C | 70 °C |
| ACW1600         | 800               | 800                                  | 800   | 800   | 800   | 800   | 800   | 800   |
|                 | 1,000             | 1,000                                | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 |
|                 | 1,250             | 1,250                                | 1,250 | 1,250 | 1,250 | 1,250 | 1,240 | 1,090 |
|                 | 1,600             | 1,600                                | 1,600 | 1,560 | 1,510 | 1,470 | 1,420 | 1,360 |

| Circuit breaker | Rated current (A) | Vertical connection output |       |       |       |       |       |       |
|-----------------|-------------------|----------------------------|-------|-------|-------|-------|-------|-------|
|                 |                   | 40 °C                      | 45 °C | 50 °C | 55 °C | 60 °C | 65 °C | 70 °C |
| ACW1600         | 800               | 800                        | 800   | 800   | 800   | 800   | 800   | 800   |
|                 | 1,000             | 1,000                      | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 |
|                 | 1,250             | 1,250                      | 1,250 | 1,250 | 1,250 | 1,250 | 1,250 | 1,180 |
|                 | 1,600             | 1,600                      | 1,600 | 1,600 | 1,600 | 1,600 | 1,510 | 1,460 |

## Rated current and voltage derating due to altitude

| Altitude (m) | Rated operational voltage - $U_e$ (V) | Rated current - $I_n$ (A) |
|--------------|---------------------------------------|---------------------------|
| 2,000        | 1.00                                  | 1.00                      |
| 3,000        | 0.91                                  | 0.98                      |
| 4,000        | 0.82                                  | 0.96                      |
| 5,000        | 0.73                                  | 0.94                      |
| 6,000        | 0.65                                  | 0.92                      |

# Conductors and terminals connections

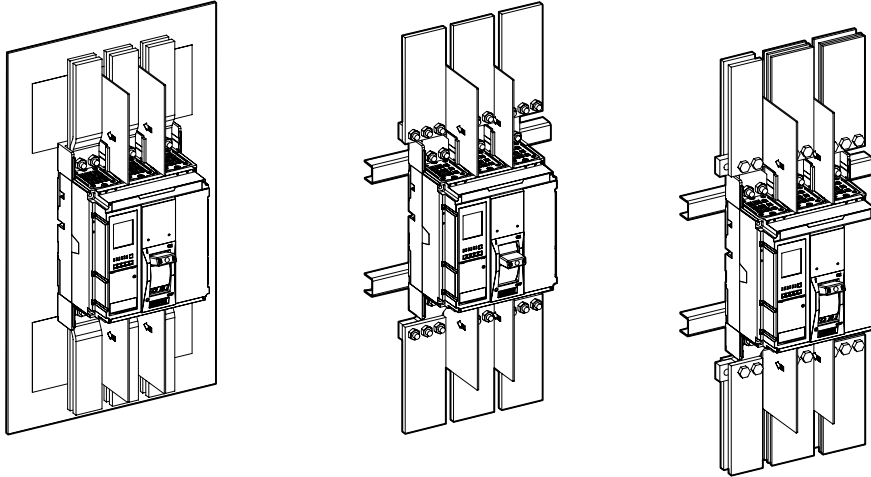
|                            |                         | Cable (mm <sup>2</sup> ) |           | Terminal (mm) |                  | Conductor (mm) |  |
|----------------------------|-------------------------|--------------------------|-----------|---------------|------------------|----------------|--|
| ACW100<br>ACW160           | Number of cables        | 1                        | 2         |               | <br>Max. 15.0 Nm |                |  |
|                            | Silicone coated         | 25 to 50                 | 25 to 50  |               |                  |                |  |
|                            | PVC                     | 25 to 70                 | 25 to 70  |               |                  |                |  |
|                            | Without extension bar   |                          |           |               |                  |                |  |
| ACW101<br>ACW161<br>ACW250 | Number of cables        | 1                        | 2         |               | <br>Max. 15.0 Nm |                |  |
|                            | Silicone coated         | 25 to 70                 | 25 to 70  |               |                  |                |  |
|                            | PVC                     | 25 to 95                 | 25 to 95  |               |                  |                |  |
|                            | Without extension bar   |                          |           |               |                  |                |  |
| ACW400<br>ACW630           | Number of cables        | 1                        | 2         |               | <br>Max. 50.0 Nm |                |  |
|                            | Silicone coated         | 35 to 150                | 95 to 150 |               |                  |                |  |
|                            | PVC                     | 50 to 185                | 50 to 185 |               |                  |                |  |
|                            | Without extension bar   |                          |           |               |                  |                |  |
| ACW800                     | With extension bar only |                          |           |               | <br>Max. 65.0 Nm |                |  |
|                            |                         |                          |           |               |                  |                |  |

# Conductors and terminals connections

## Terminal size for ACW1600

Maximum acceptable temperature on busbars is 100 °C.

T: temperature around the circuit breaker and its connections.



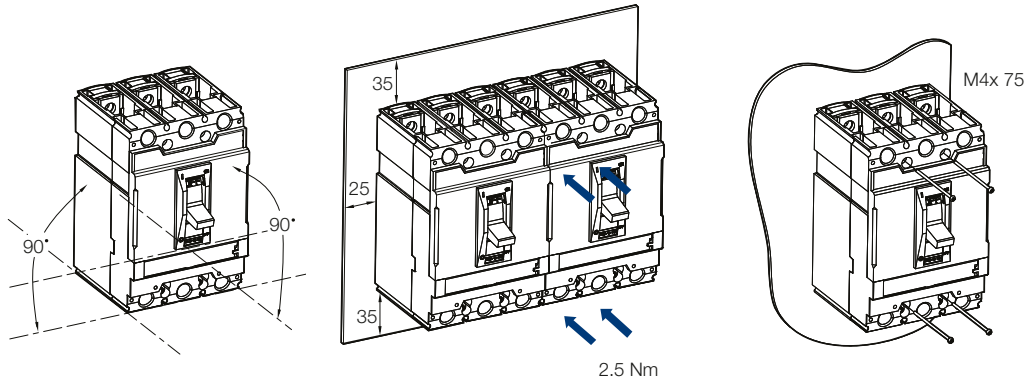
| Circuit breaker | Maximum current | T:40 °C<br>Number of busbars |           | T:50 °C<br>Number of busbars |           | T:60 °C<br>Number of busbars |           |
|-----------------|-----------------|------------------------------|-----------|------------------------------|-----------|------------------------------|-----------|
|                 |                 | t = 5 mm                     | t = 10 mm | t = 5 mm                     | t = 10 mm | t = 5 mm                     | t = 10 mm |
| ACW1600         | 800             | 2b.5t×50                     | 1b.10t×50 | 2b.5t×50                     | 1b.10t×50 | 2b.5t×50                     | 1b.10t×60 |
|                 | 1,000           | 3b.5t×50                     | 1b.10t×60 | 3b.5t×50                     | 2b.10t×50 | 3b.5t×60                     | 2b.10t×50 |
|                 | 1,250           | 3b.5t×50                     | 2b.10t×40 | 3b.5t×50                     | 2b.10t×50 | 3b.5t×60                     | 2b.10t×50 |
|                 |                 | 2b.5t×80                     | 2b.10t×40 | 2b.5t×80                     | -         | -                            | -         |
| 1,600           | 3b.5t×80        | 2b.10t×60                    | 3b.5t×80  | 2b.10t×60                    | 3b.5t×80  | 3b.10t×50                    |           |



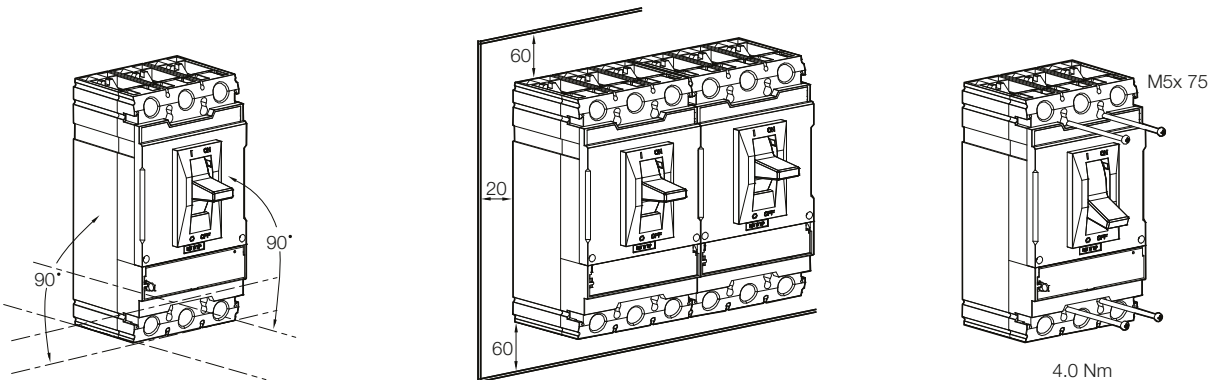
# Installation

The ACW circuit breakers were designed to simplify installation on panels, as they can be supplied from the top or bottom, without compromising the technical characteristics of the components.

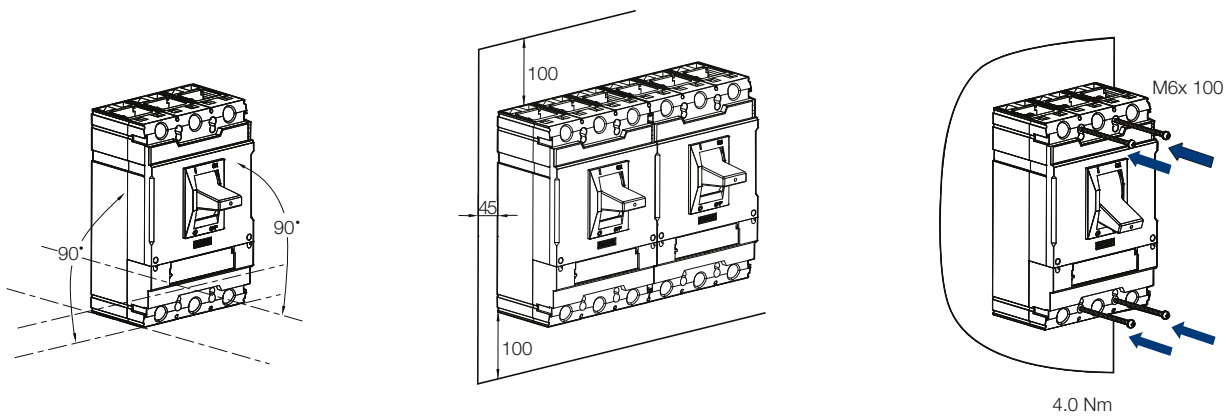
## ACW101, ACW161, ACW100, ACW160, ACW250



## ACW400, ACW630



## ACW800





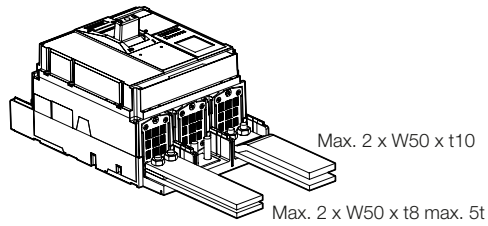
# Installation

## Examples of busbar connection

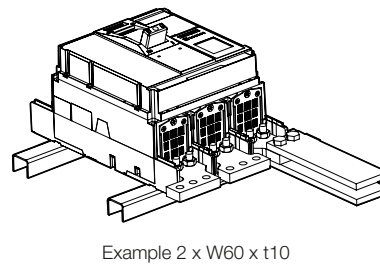
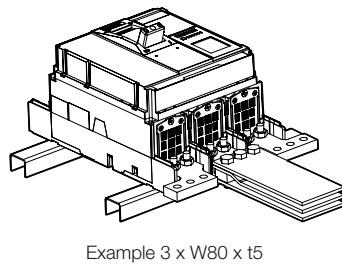
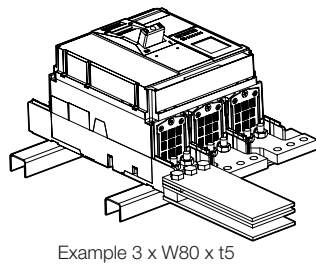
The ACW1600 can be installed vertically, horizontally or flat on their back.

### Frontal type

#### Frontal type with busbars for fixation

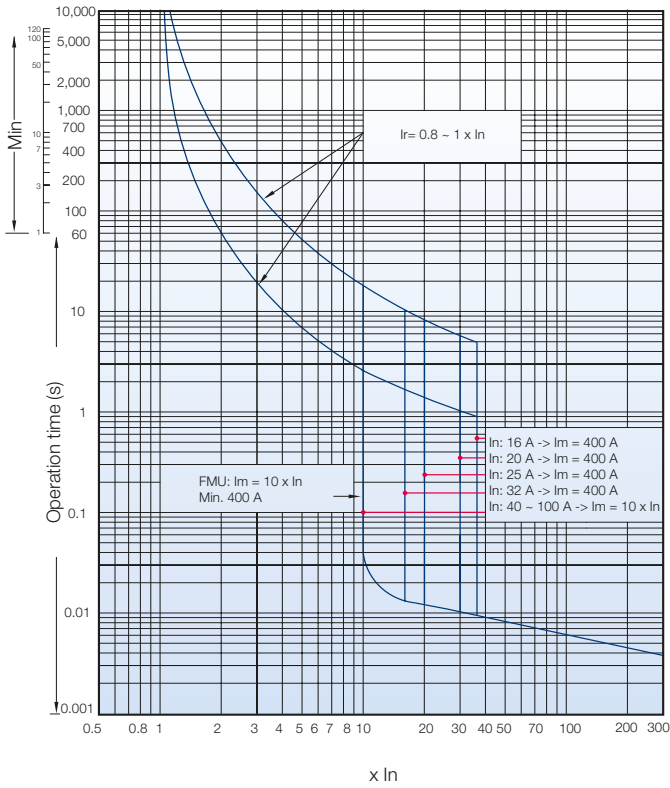


#### Frontal type with busbar (only on rail)

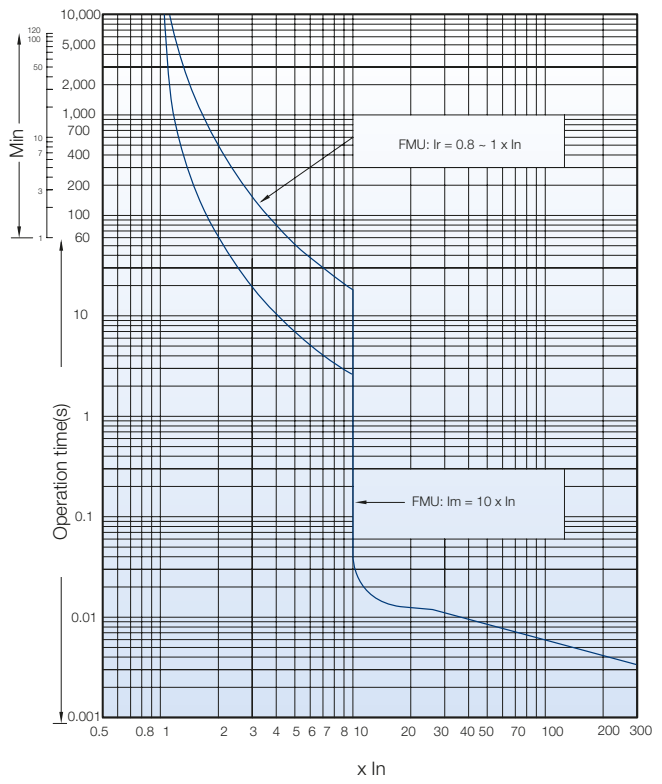


# Curves

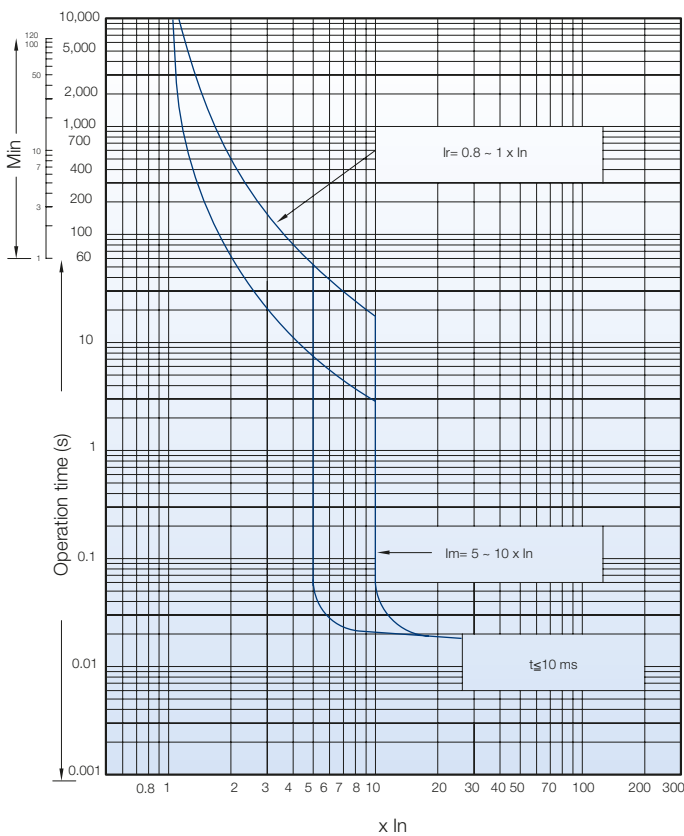
## ACW100 - FMU



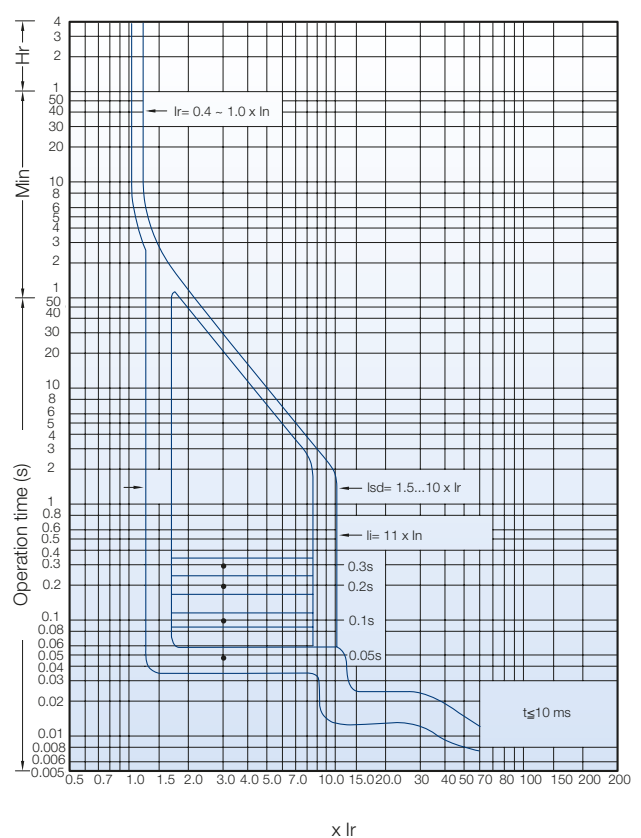
## ACW160 - FMU



## ACW250 - ATU

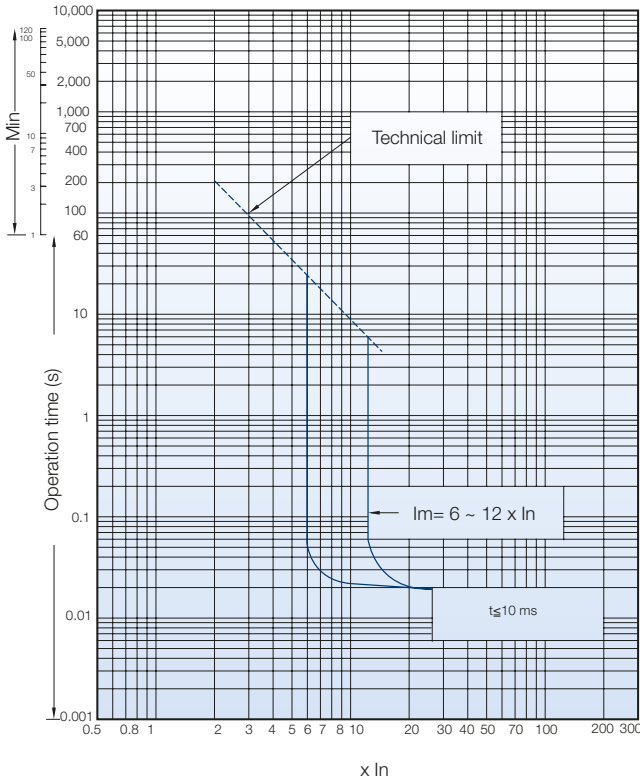


## ACW101, 161, 250, 400, 630, 800 - ETS

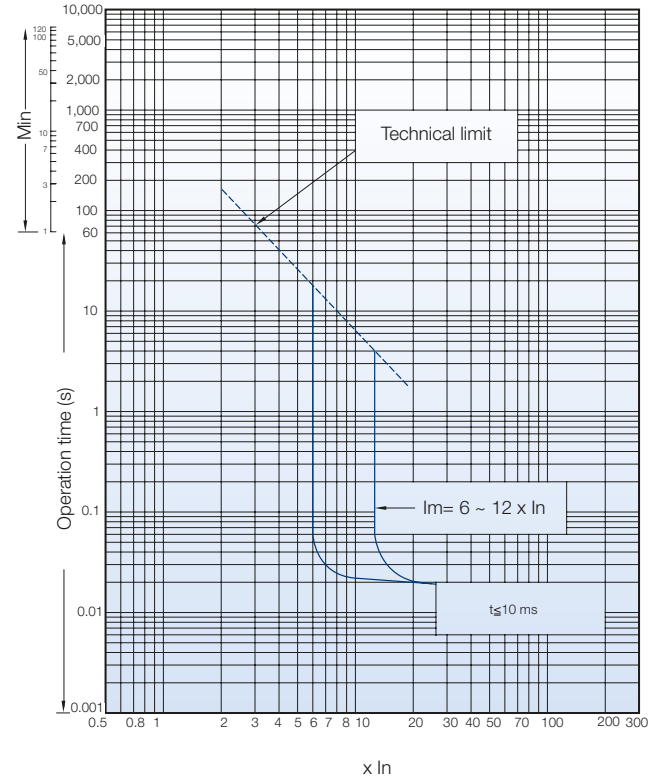


# Curves

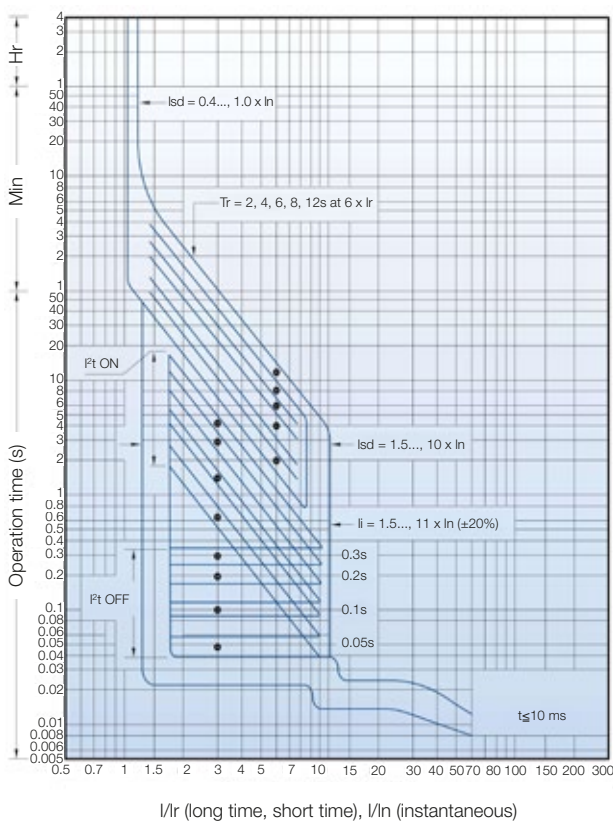
## ACW101-MTU, ACW161-MTU



## ACW250-MTU, ACW400-MTU, ACW630-MTU, ACW800-MTU

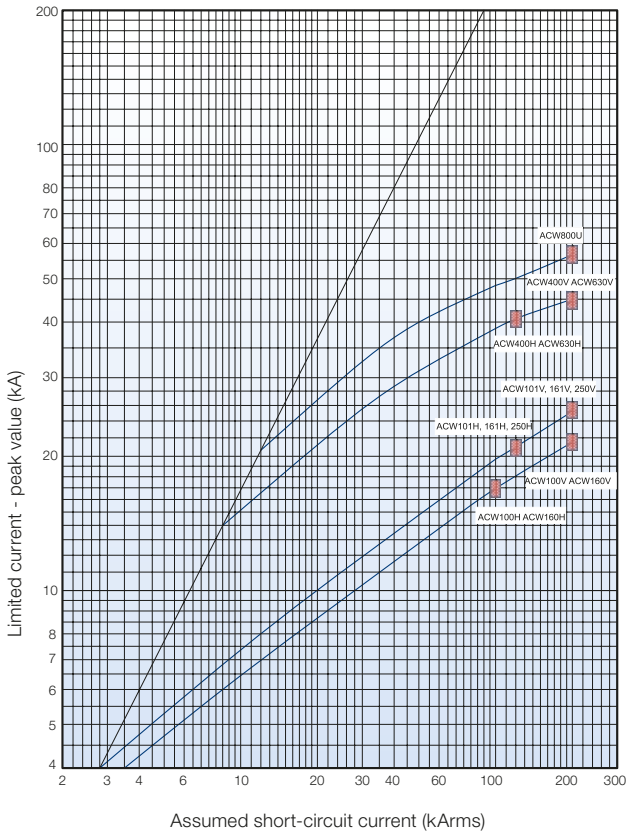


## ACW400, 630, 800 - ETM-AC

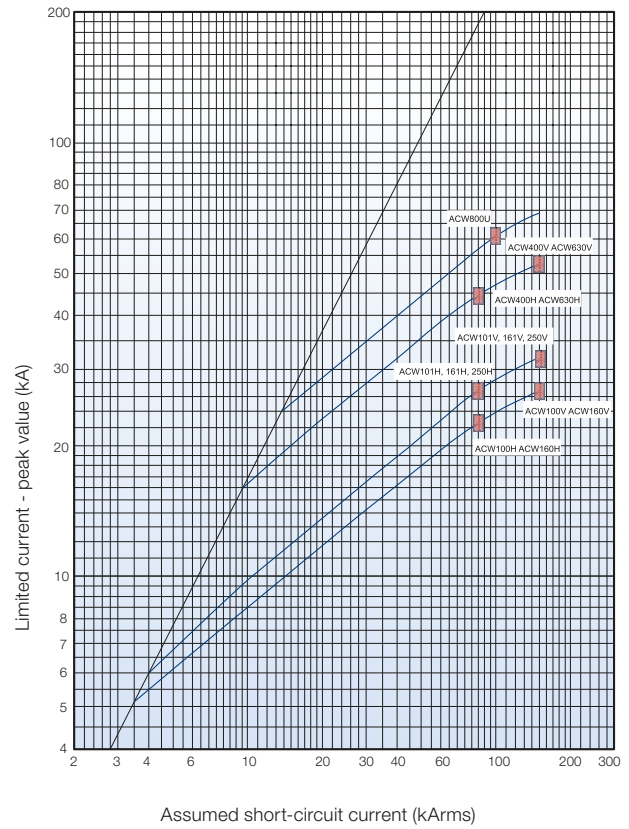


# Curves

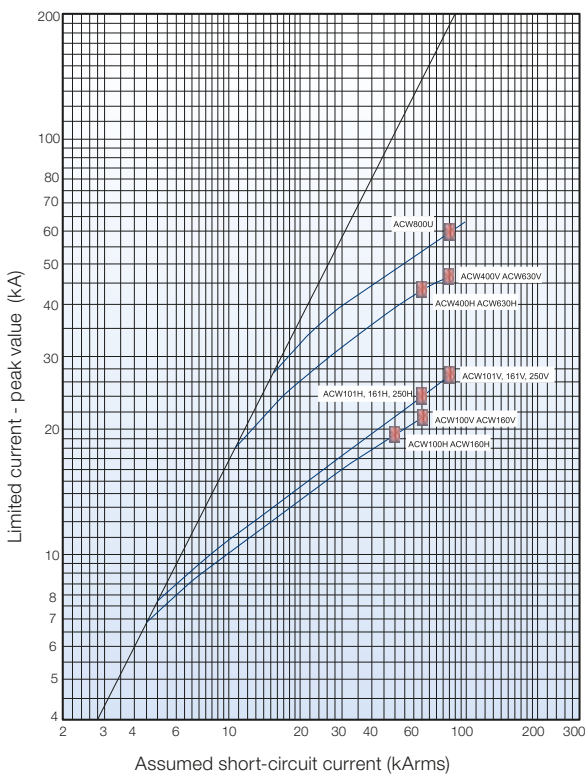
## Current limitation 200/240 V



## Current limitation 380/415 V

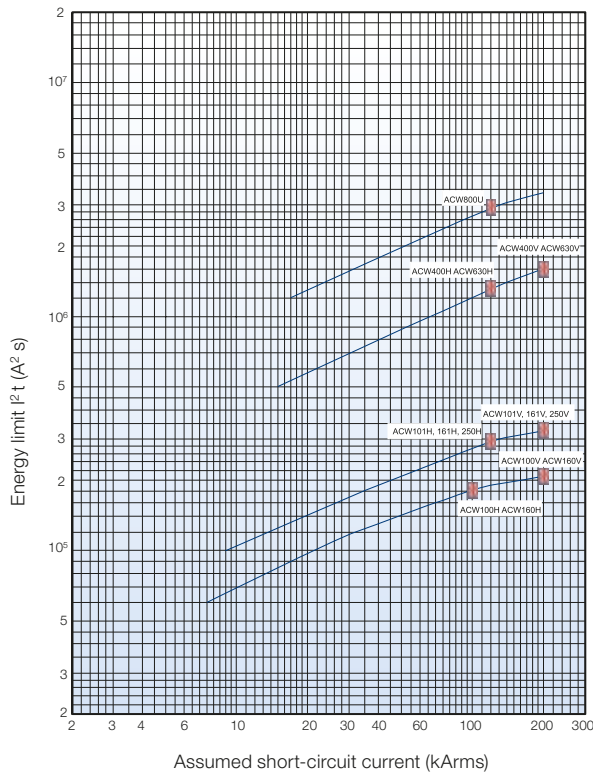


## Current limitation 480/500 V

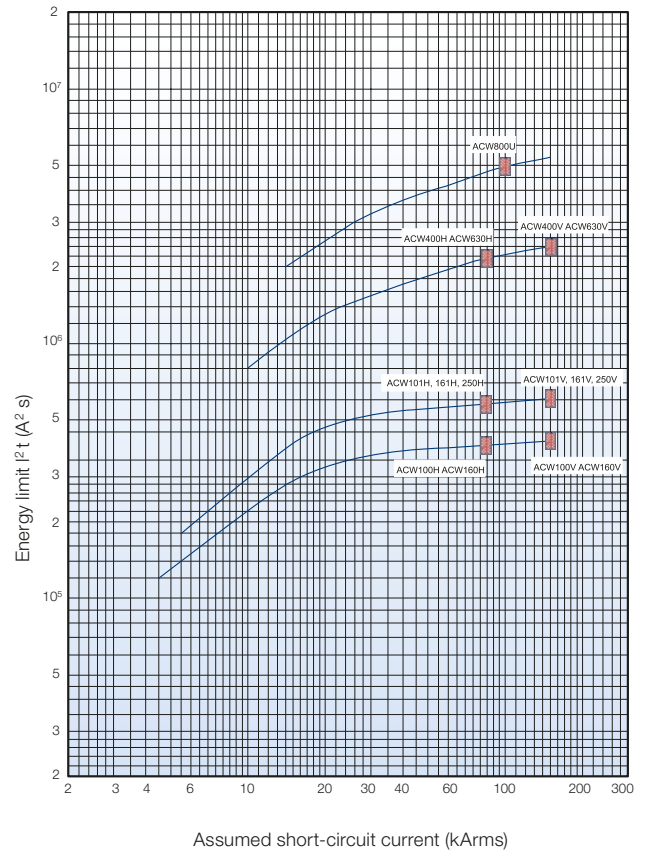


# Curves

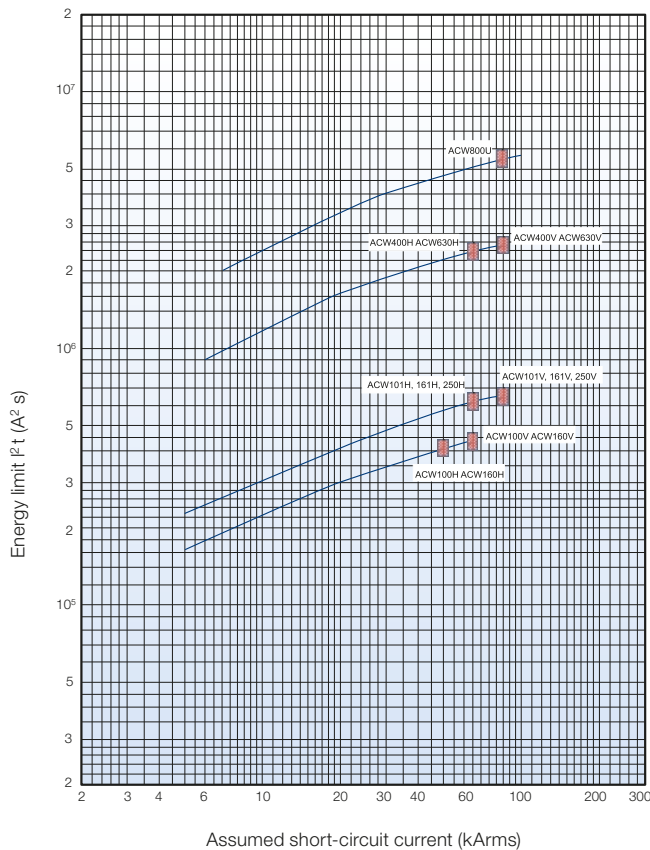
## Energy limitation I<sup>2</sup>t - 220/240 V



## Energy limitation I<sup>2</sup>t - 380/410 V



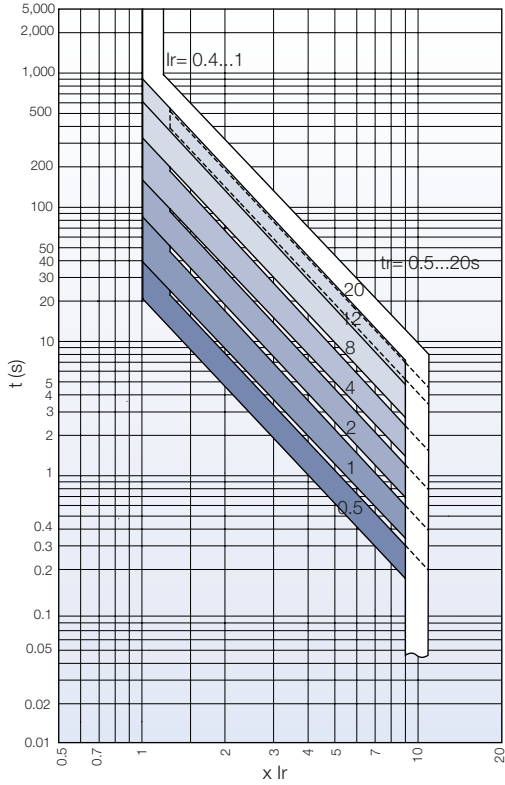
## Energy limitation I<sup>2</sup>t - 480/500 V



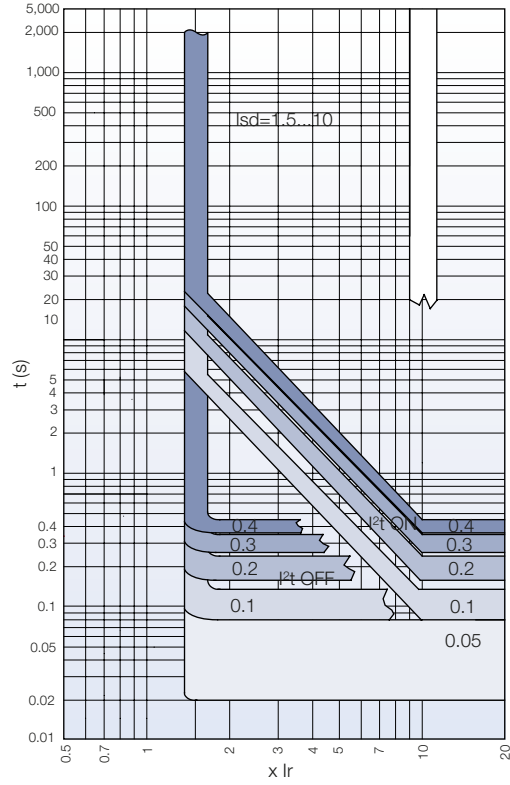
# Curves

## ACW1600

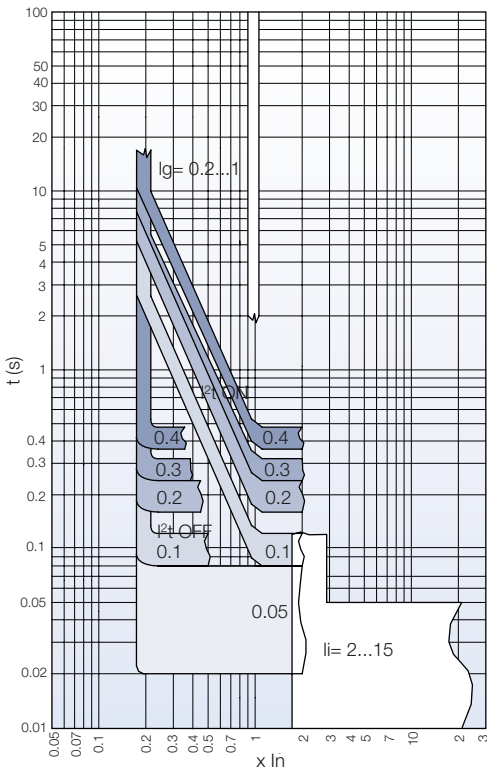
### Long delay (L)



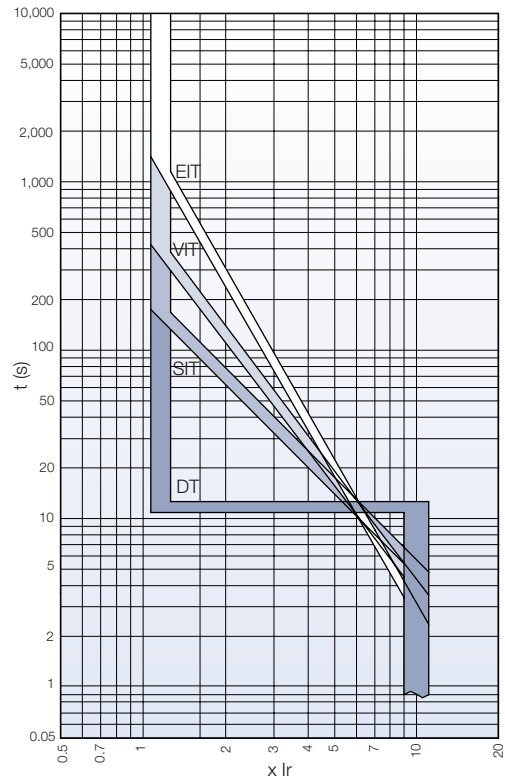
### Short delay (S)



### Instantaneous (I) - Ground fault (G)



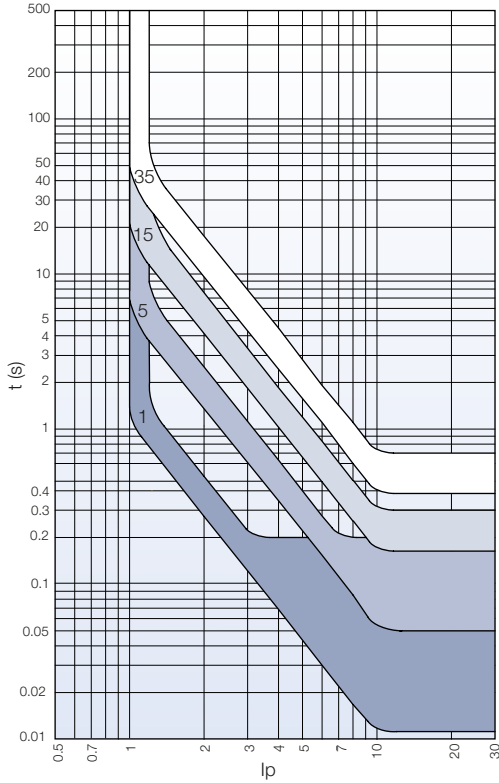
### IDMTL



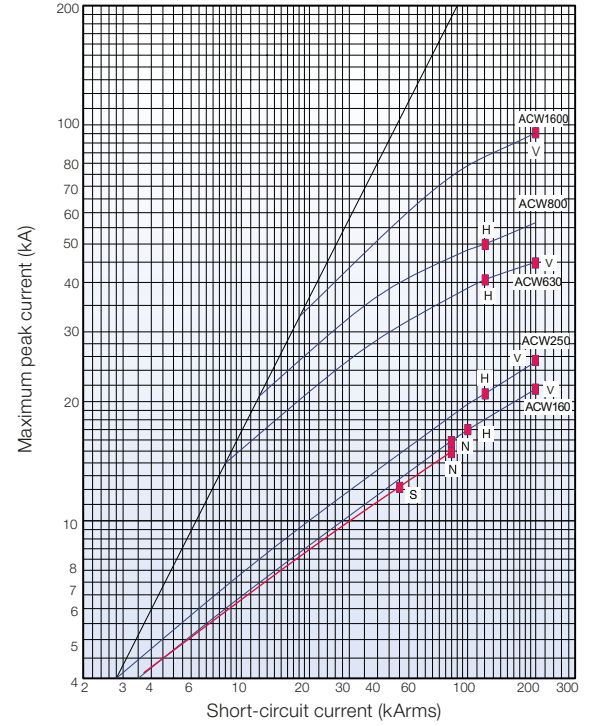
# Curves

## ACW1600

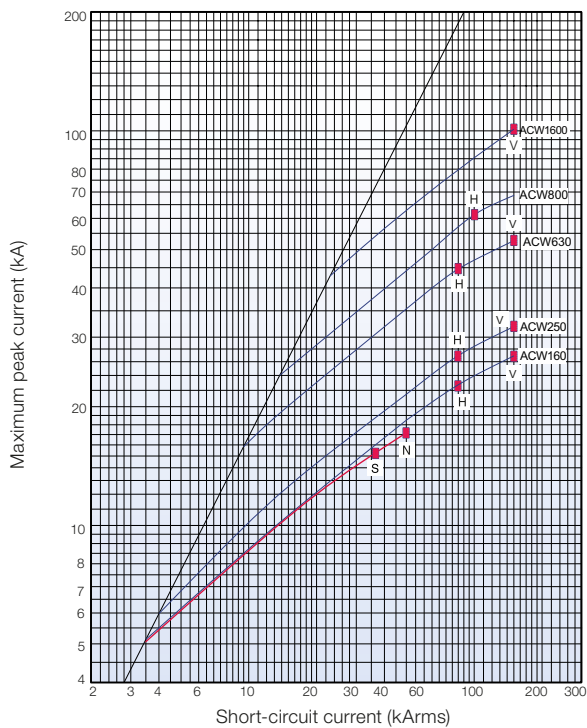
### Pre-alarm



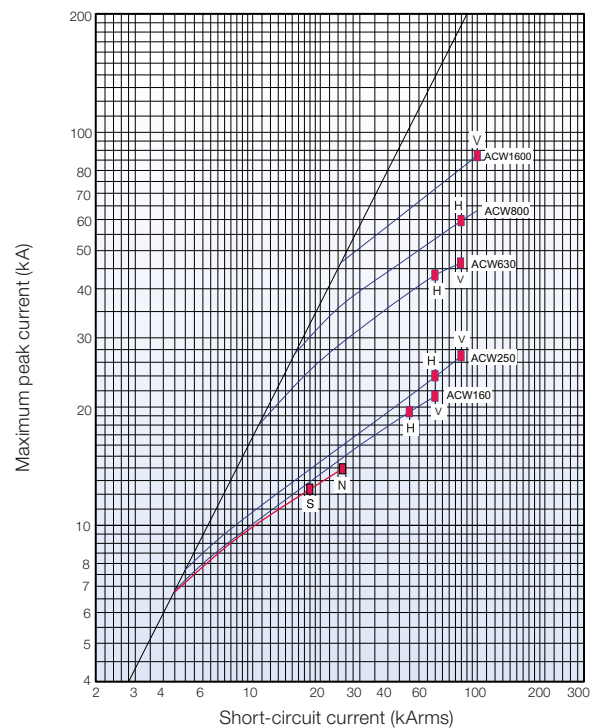
### Short-circuit limitation 220/240 V



### Short-circuit limitation 380/415 V

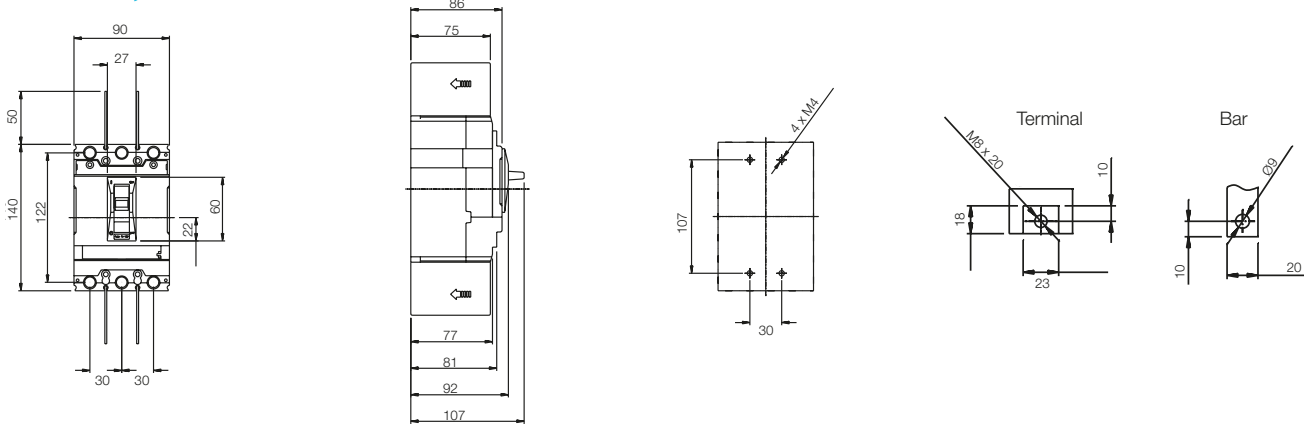


### Short-circuit limitation 480/500 V

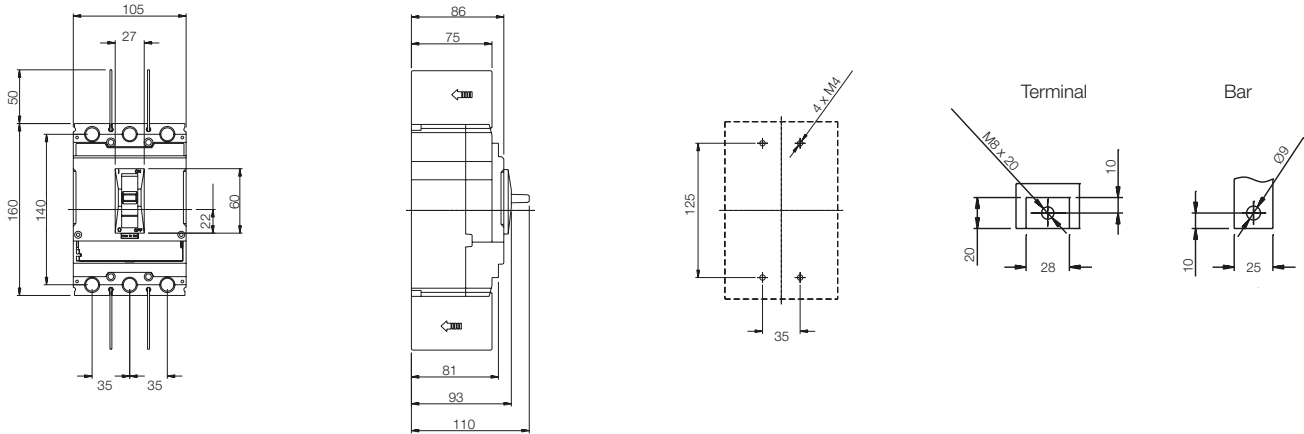


# Dimensions

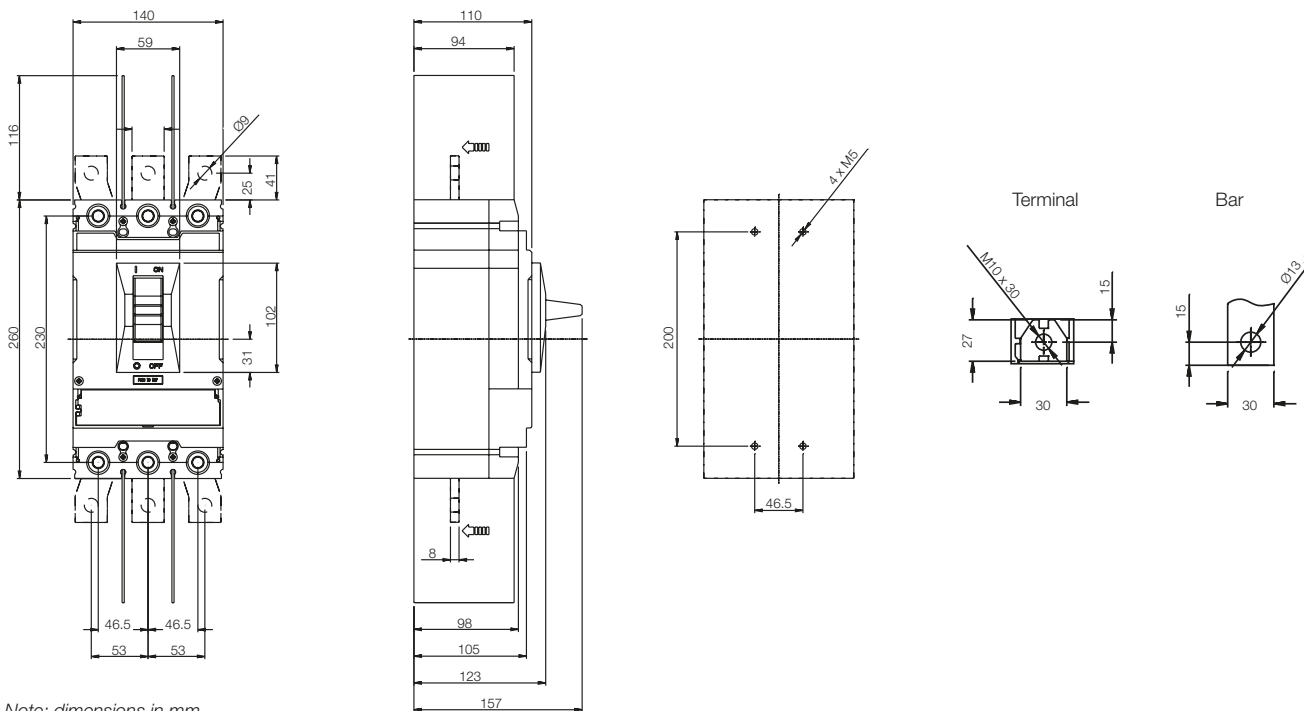
## Circuit breakers ACW100, ACW160



## ACW101, ACW161, ACW250



## ACW400, ACW630

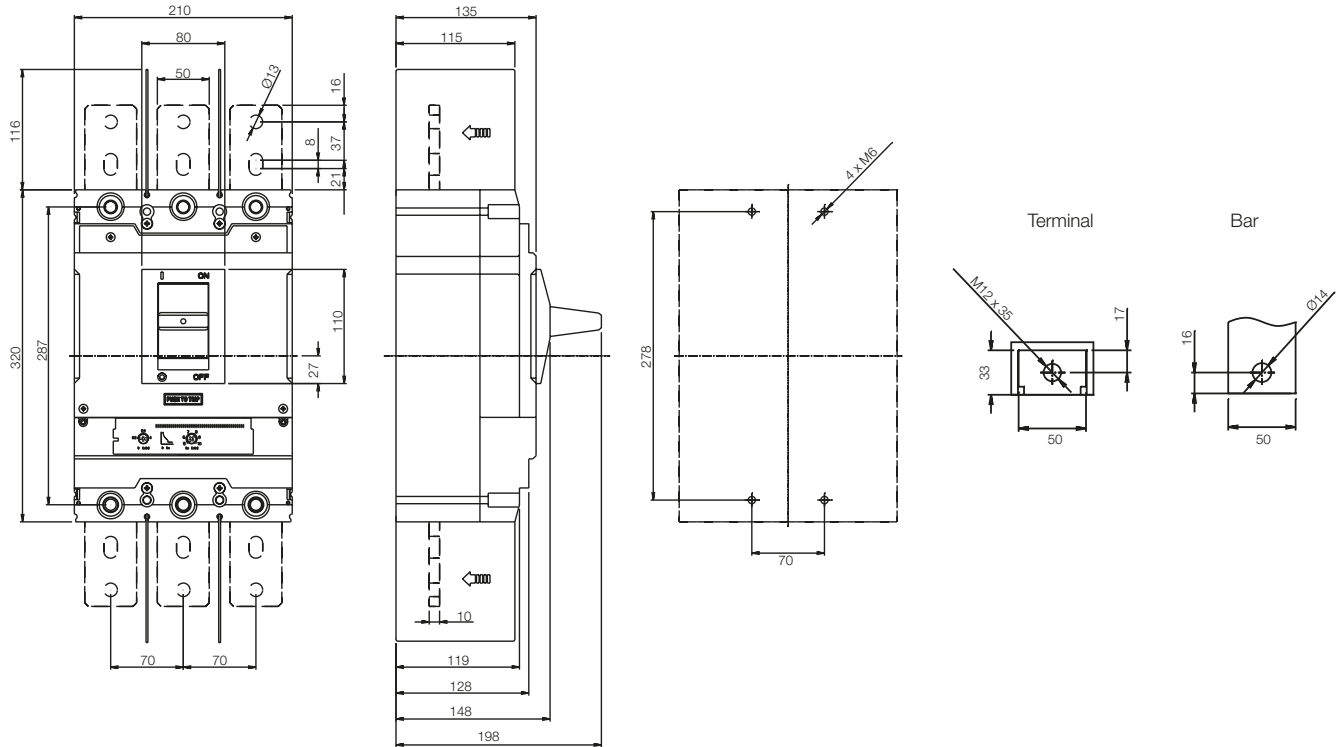


Note: dimensions in mm.

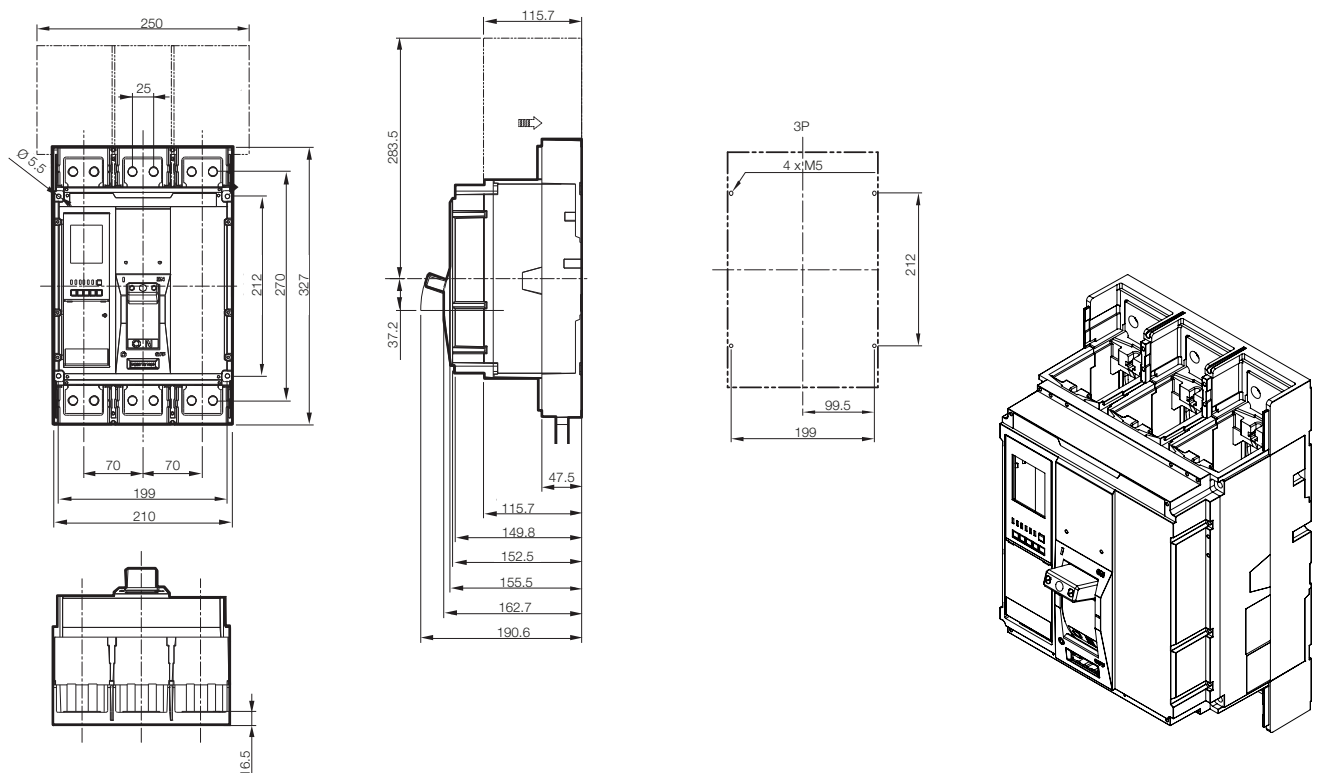


# Dimensions

## Circuit breakers ACW800



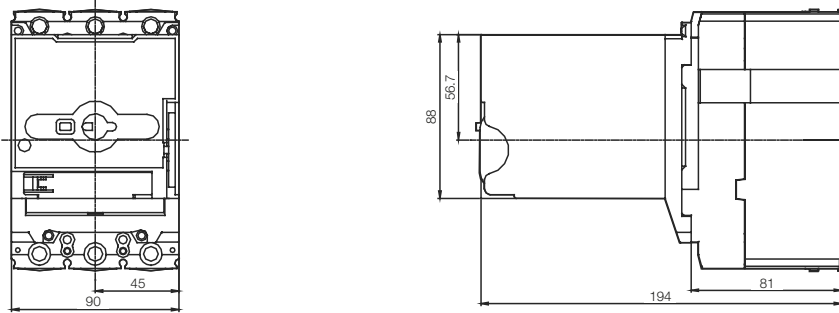
## ACW1600



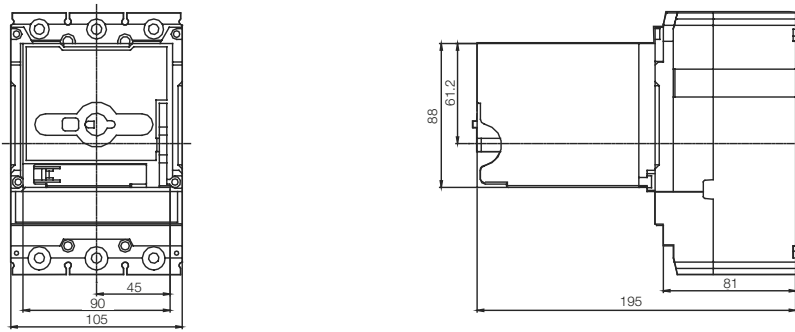
Note: dimensions in mm.

# Dimensions

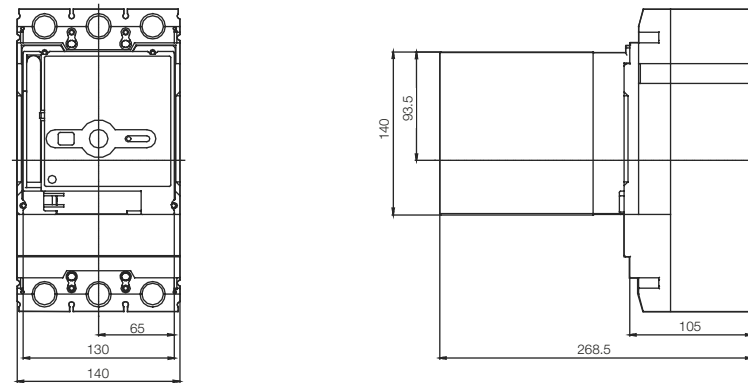
## Motor operator AM ACW100, ACW160



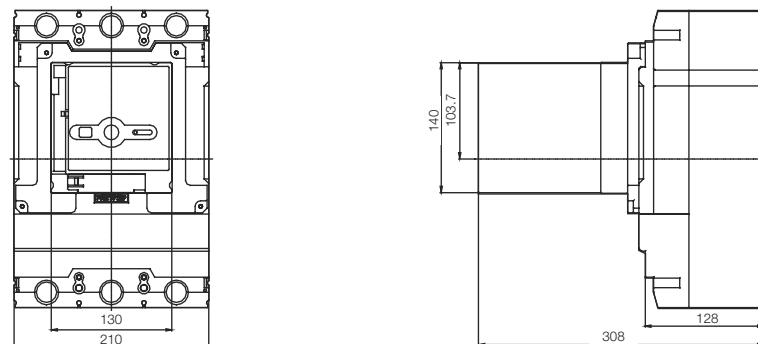
## AM ACW101, ACW161, ACW250



## AM ACW400, ACW630



## AM ACW800



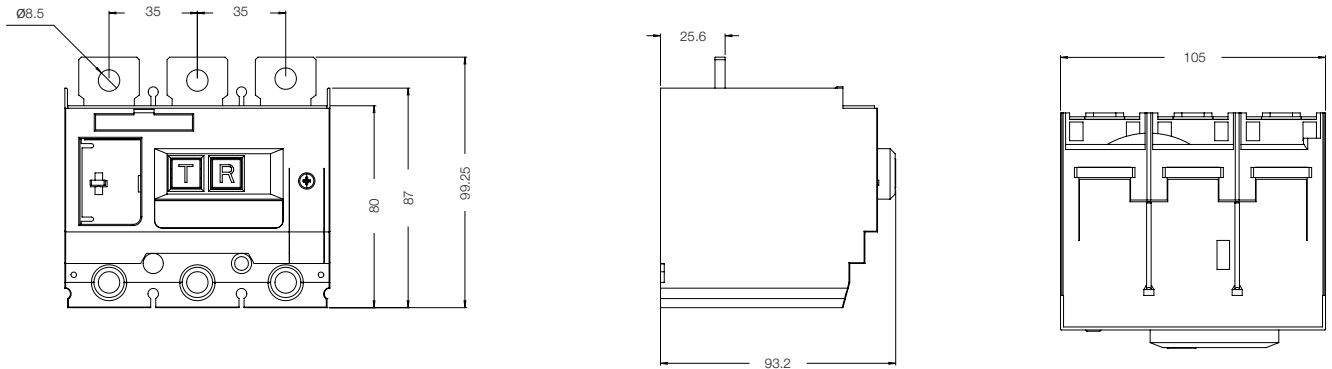
Note: dimensions in mm.



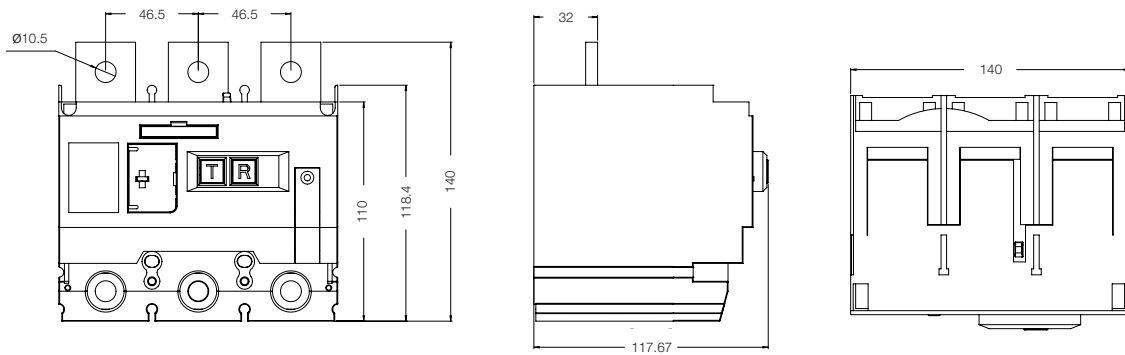
# Dimensions

## Earth leakage unit

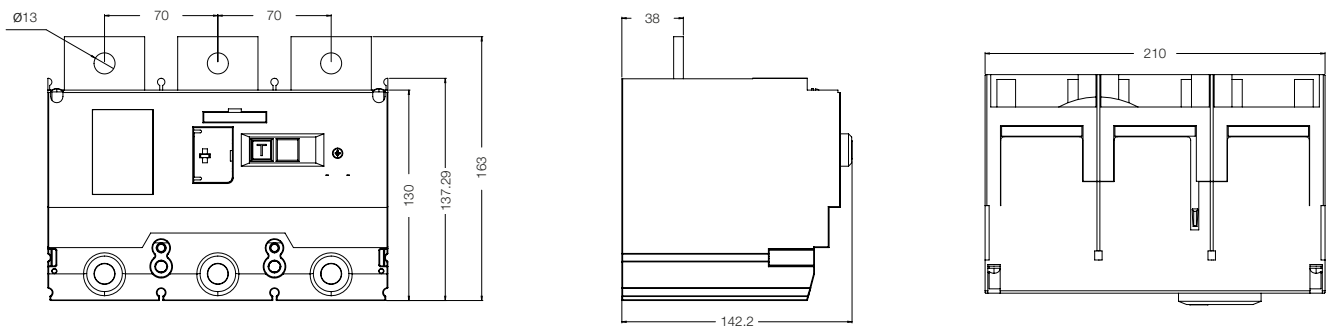
### FT ACW101, ACW161, ACW250



### FT ACW400, ACW630



### FT ACW800

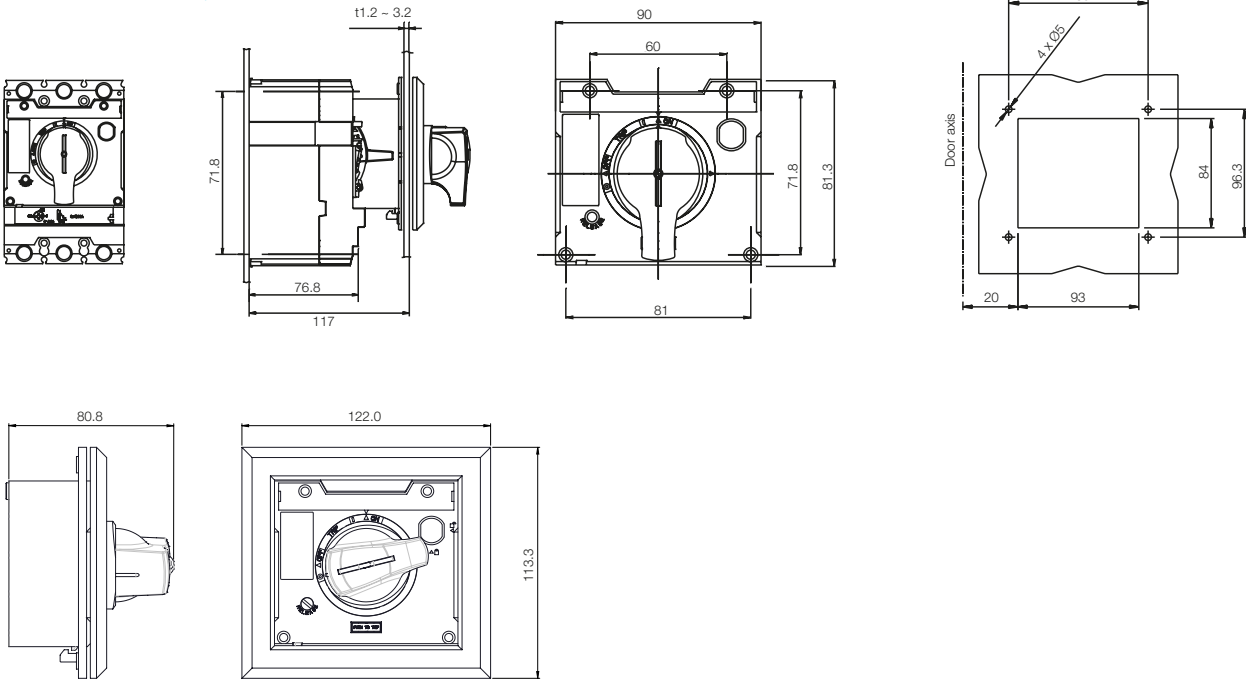


Note: dimensions in mm.

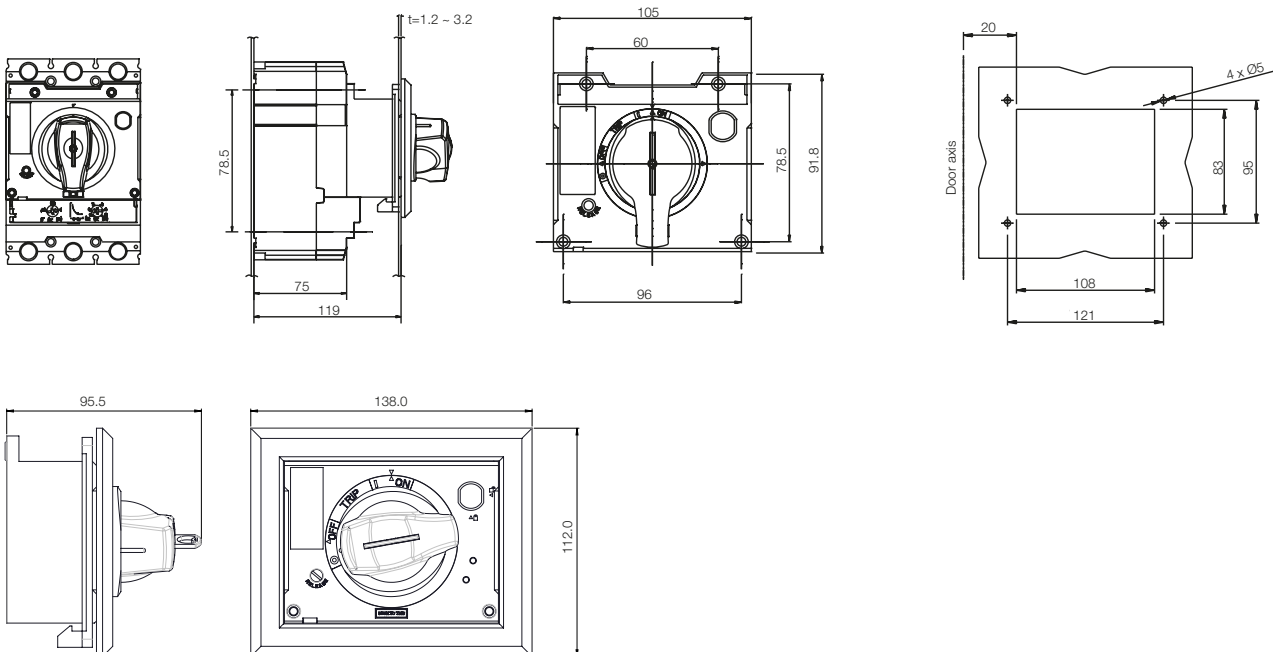


# Dimensions

## Internal rotary handle MRI ACW100, ACW160



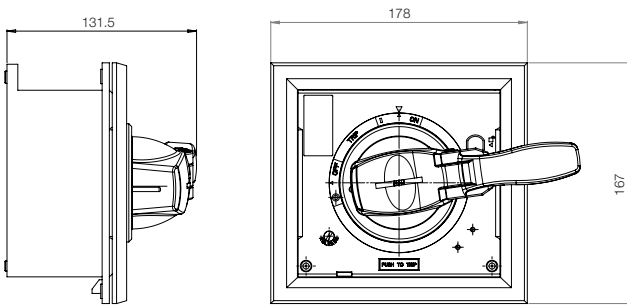
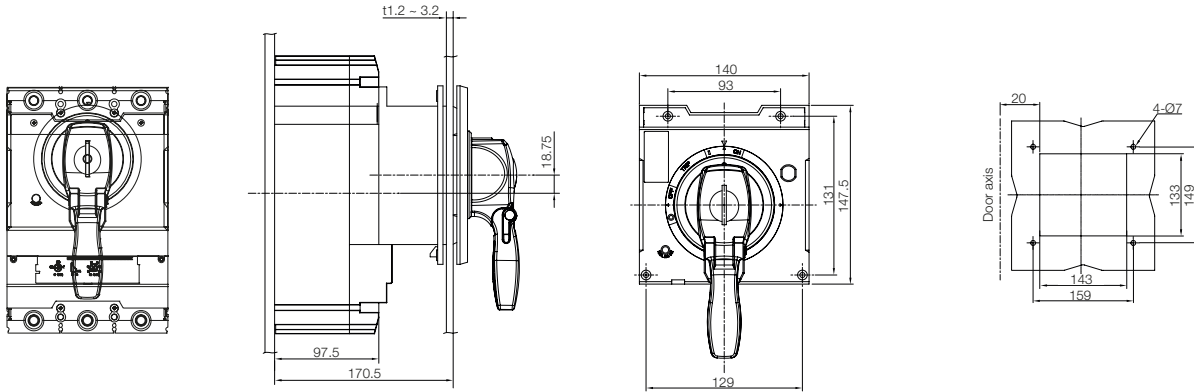
## MRI ACW101, ACW161, ACW250



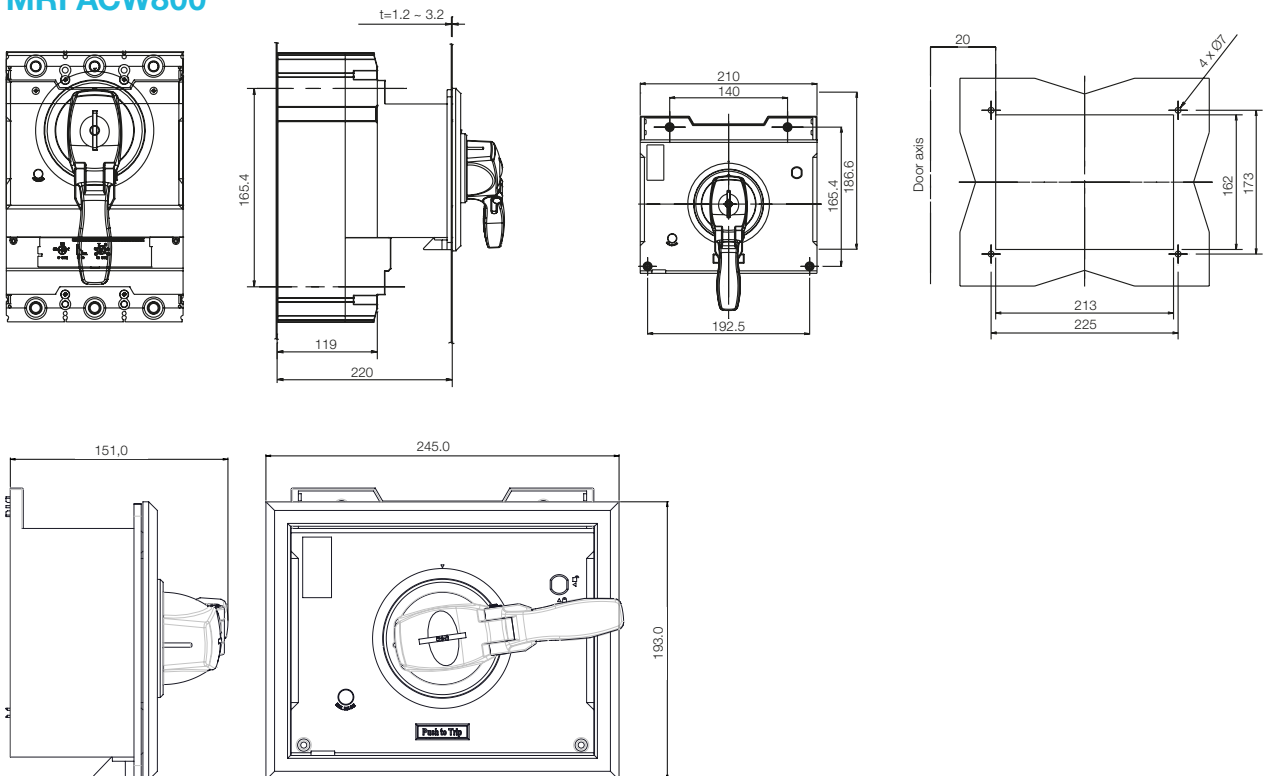
Notes: Dimensions in mm.  
Dimensional valid for MRI and MRK.

# Dimensions

## Internal rotary handle MRI ACW400, ACW630



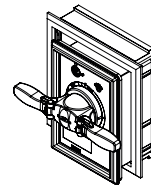
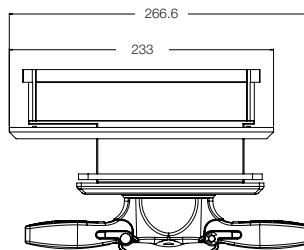
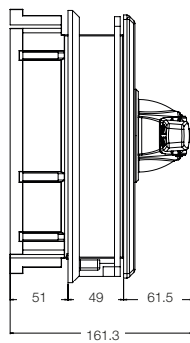
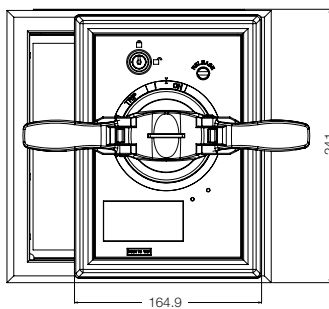
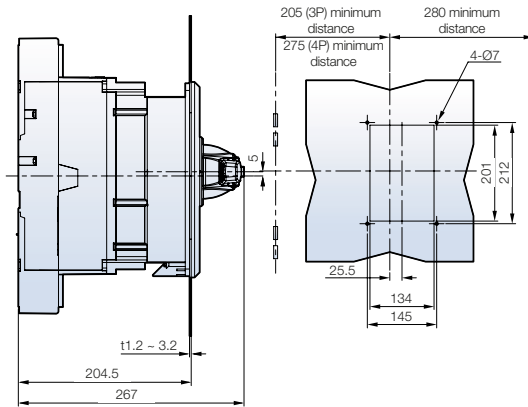
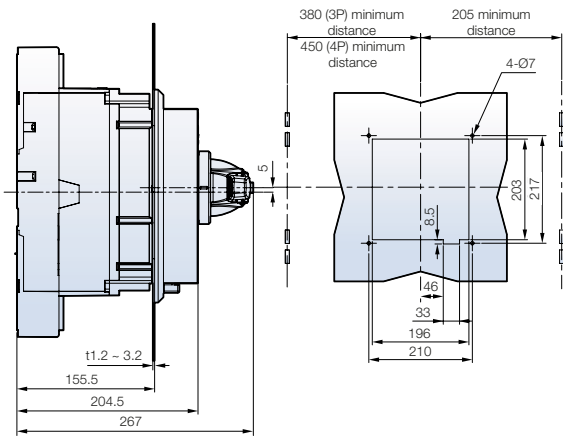
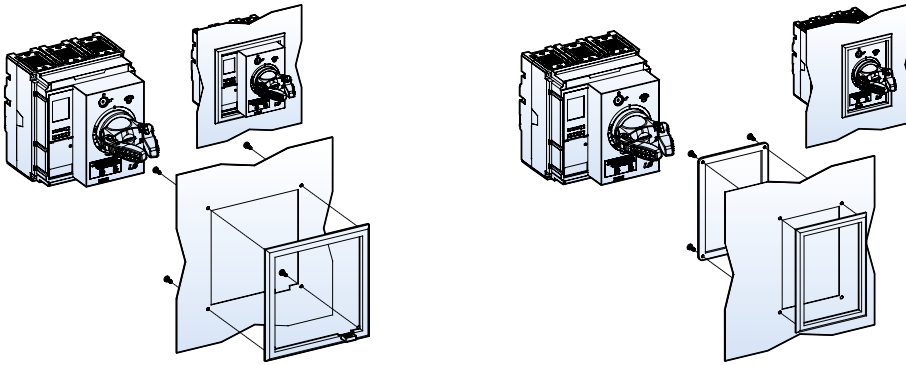
## MRI ACW800



Notes: Dimensions in mm.  
Dimensional valid for MRI and MRK.

# Dimensions

## Internal rotary handle MRI ACW1600

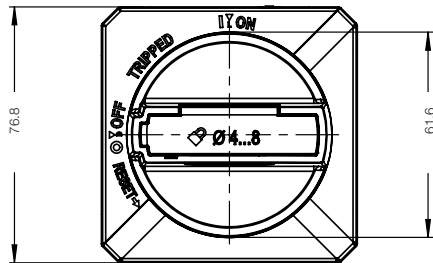


Notes: Dimensions in mm.  
Dimensional valid for MRI and MRK.

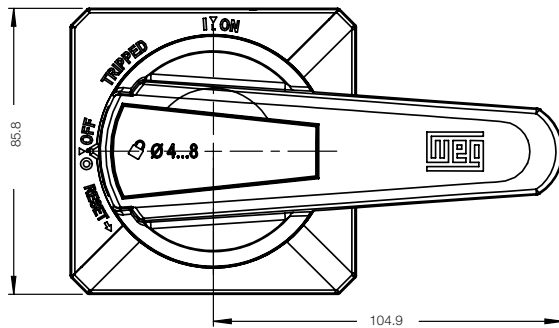
# Dimensions

## Panel door rotary operating handle

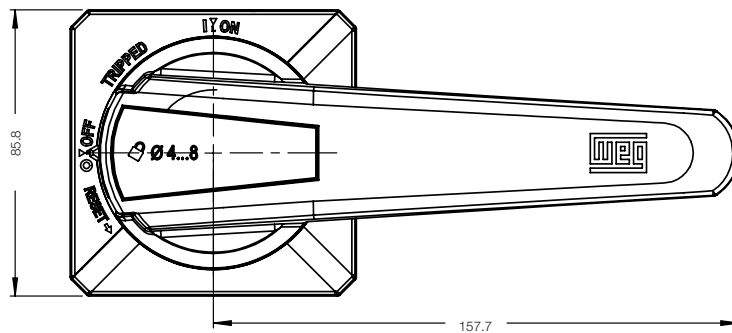
MRXS - ACW100, ACW160, ACW101, ACW161, ACW250



MRXL - ACW100, ACW160, ACW101, ACW161, ACW250



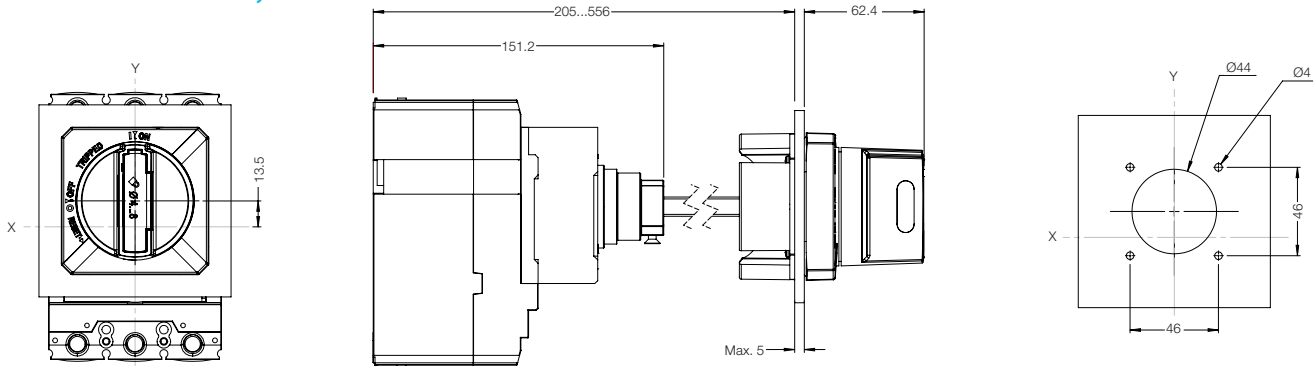
MRXL - ACW400, ACW630, ACW800



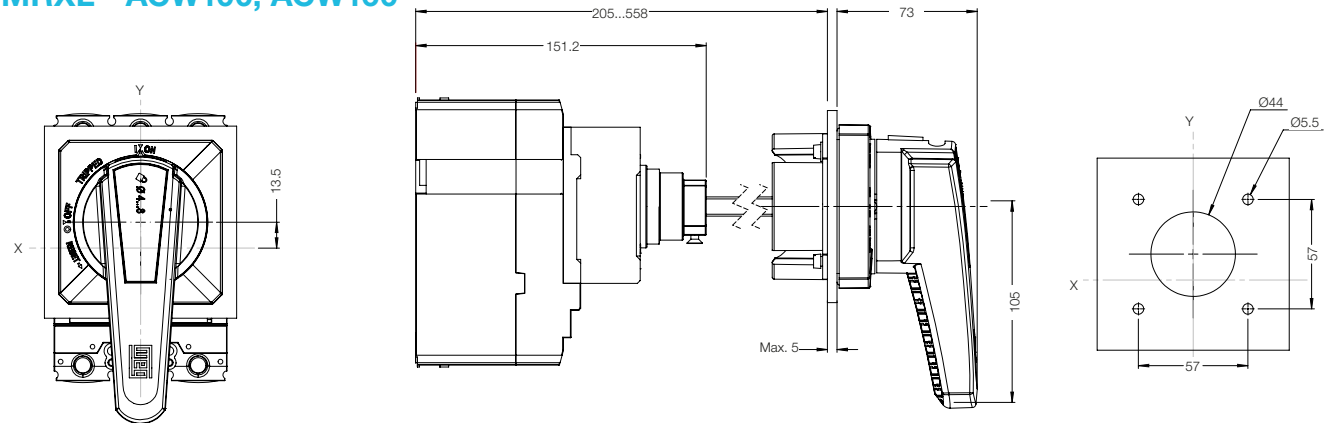
Note: dimensions in mm.

# Dimensions

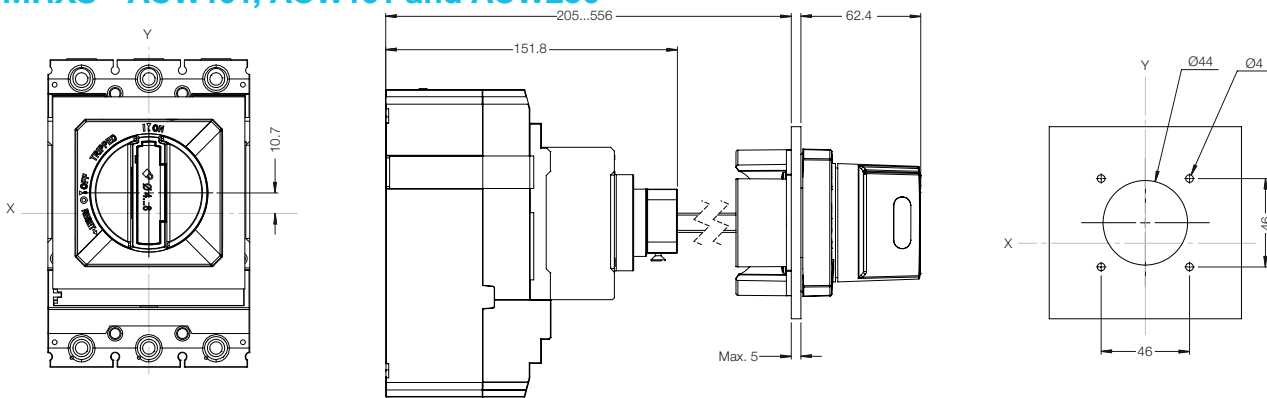
## Rotary drive for panel door MRXS - ACW100, ACW160



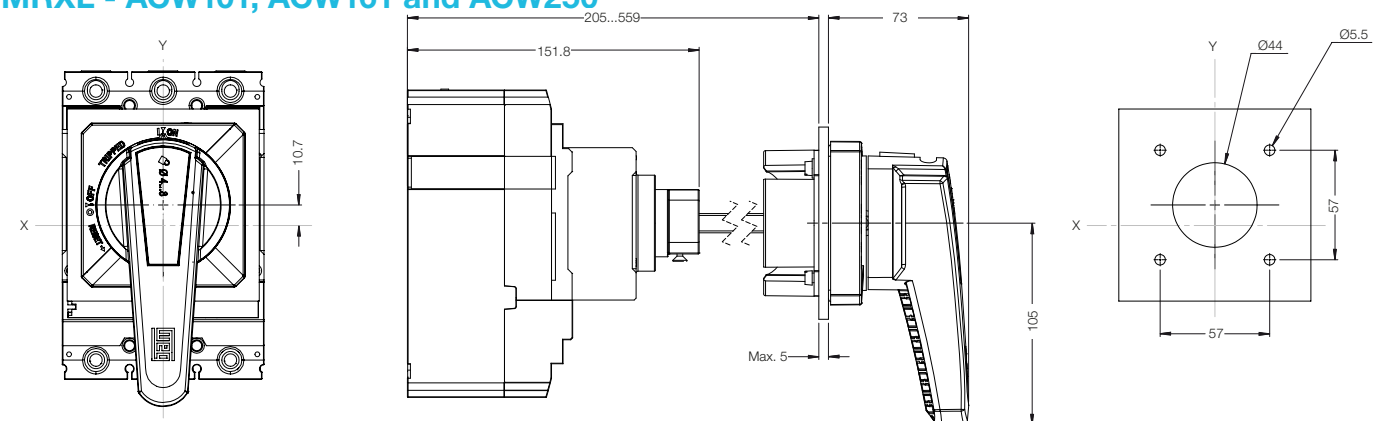
## MRXL - ACW100, ACW160



## MRXS - ACW101, ACW161 and ACW250



## MRXL - ACW101, ACW161 and ACW250

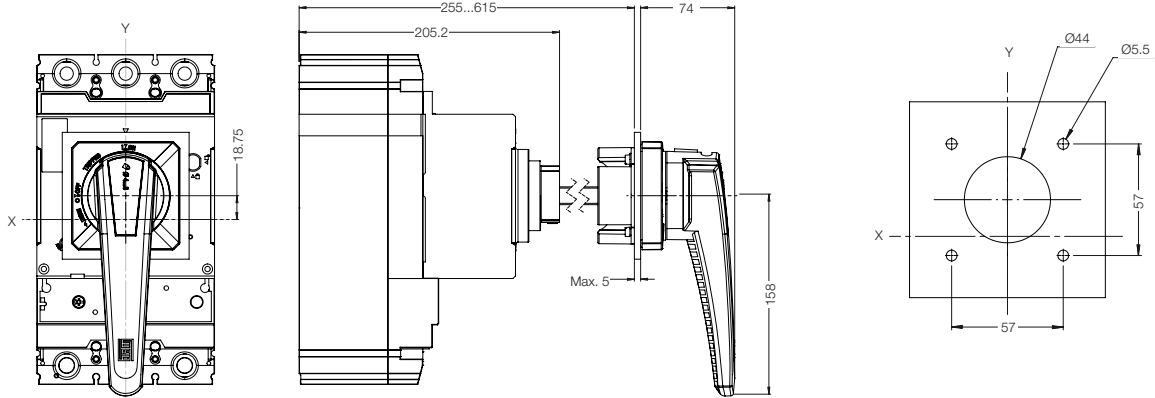


Note: dimensions in mm.

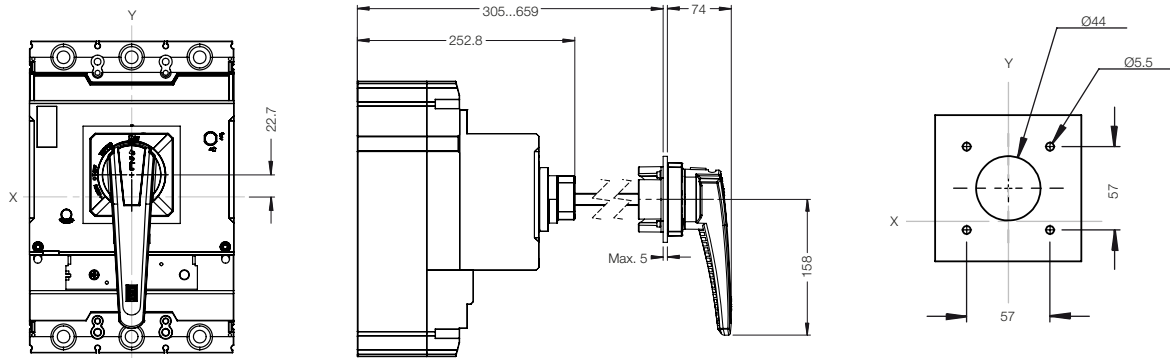


# Dimensions

## Rotary drive for panel door MRXL - ACW400 and ACW630



## MRXL - ACW800

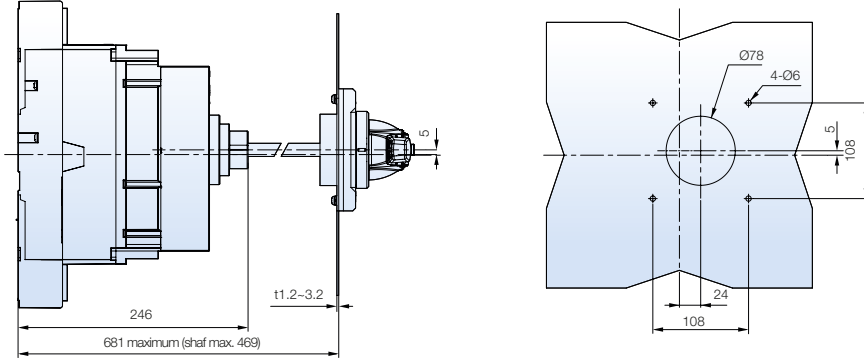


Note: dimensions in mm.

# Dimensions

## Rotary operating handle coupled to the panel

### MR469 ACW1600



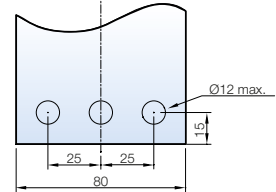
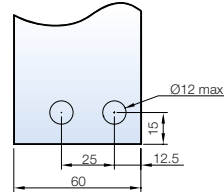
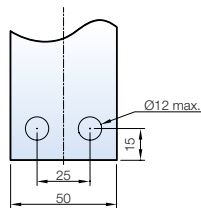
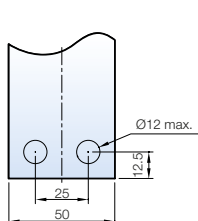
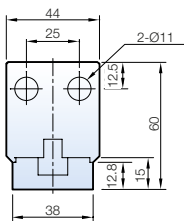
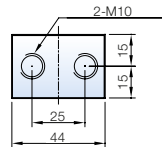
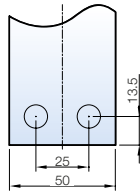
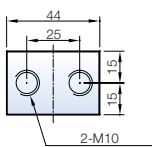
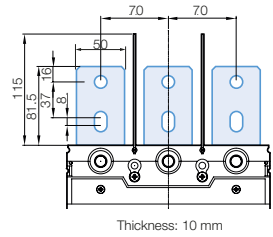
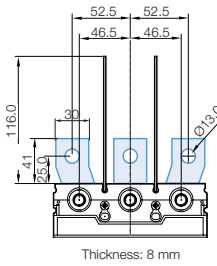
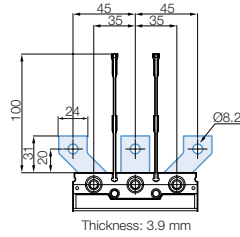
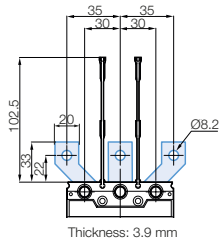
## Extension bar

### BE ACW100, ACW160

### BE ACW101, ACW161, ACW250

### BE ACW400, ACW630

### BE ACW800



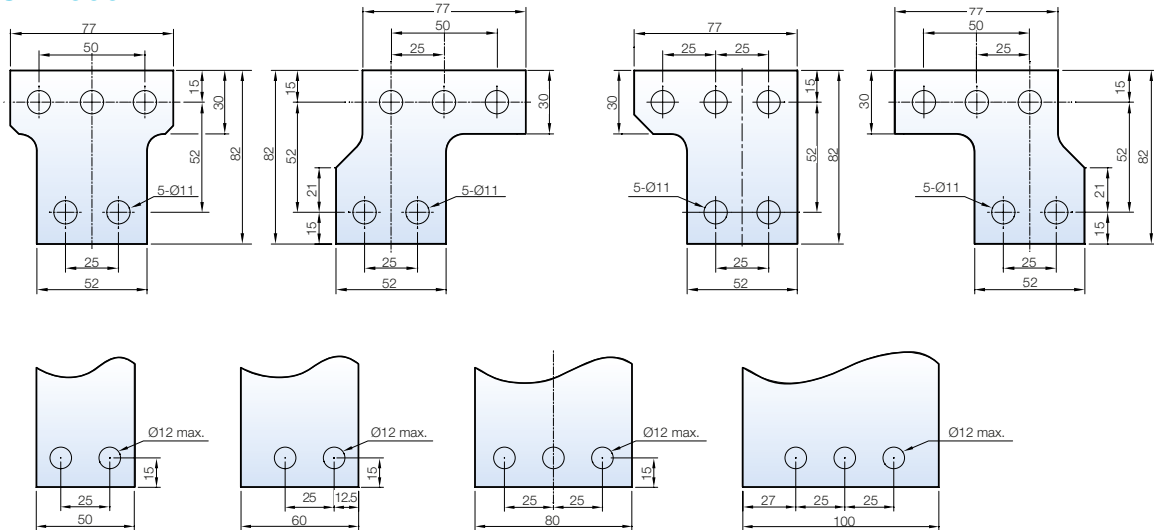
Note: dimensions in mm.



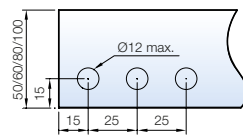
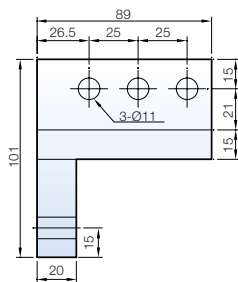
# Dimensions

## Extension bar

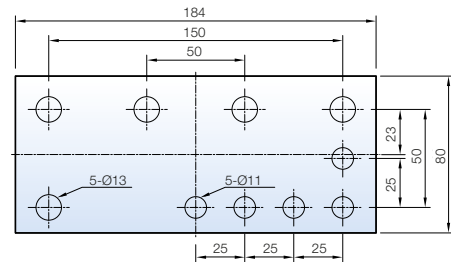
### BE ACW1600



### BEV ACW1600

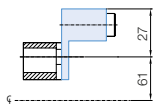


### BER ACW1600

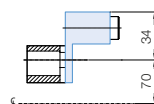


## Cable gland

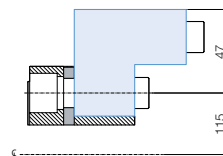
### PC2 ACW100-160



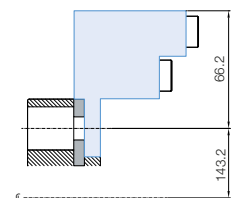
### PC2 ACW250



### PC2 ACW400-630



### PC2 ACW800

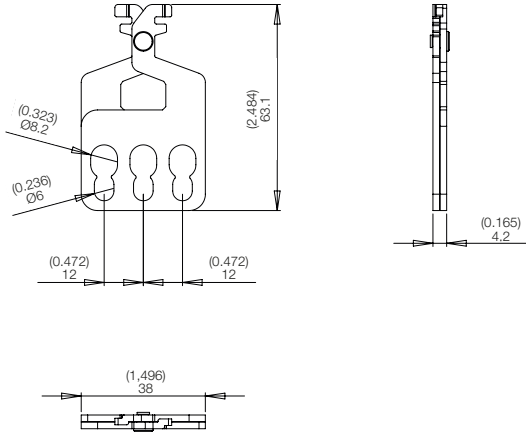


Note: dimensions in mm.

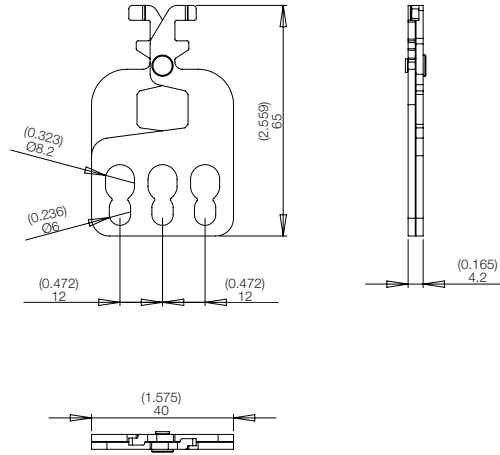
# Dimensions

## Padlocking device

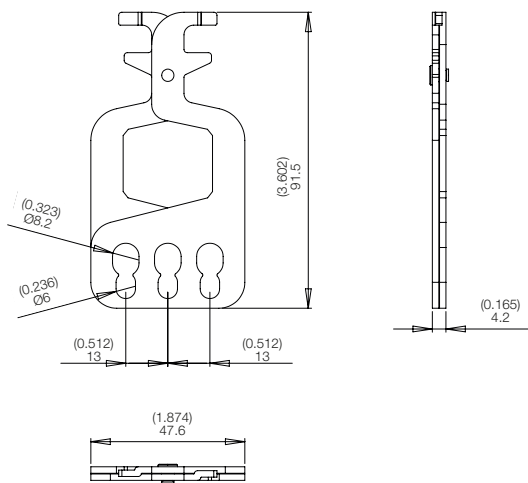
### TR ACW100, ACW160



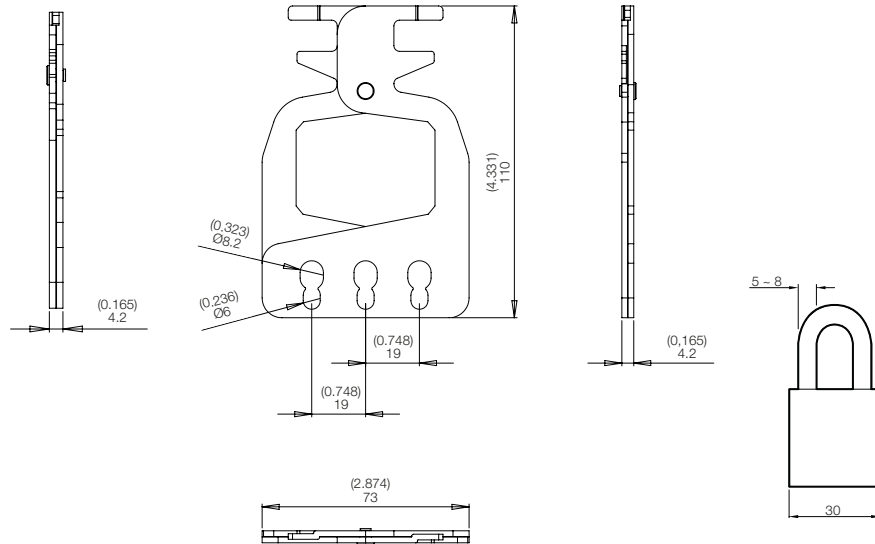
### TR ACW101, ACW161, ACW250



### TR ACW400, ACW630



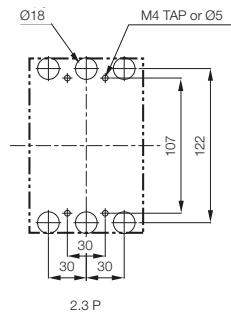
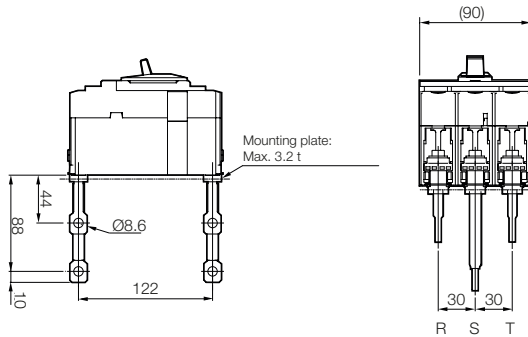
### TR ACW800



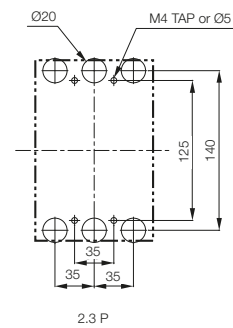
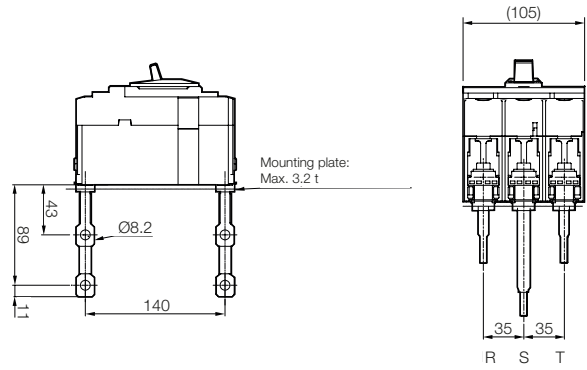
Note: dimensions in mm.

# Dimensions

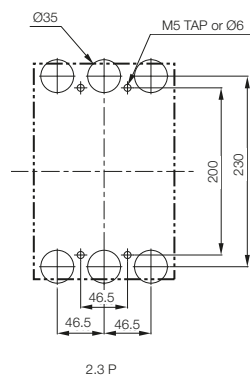
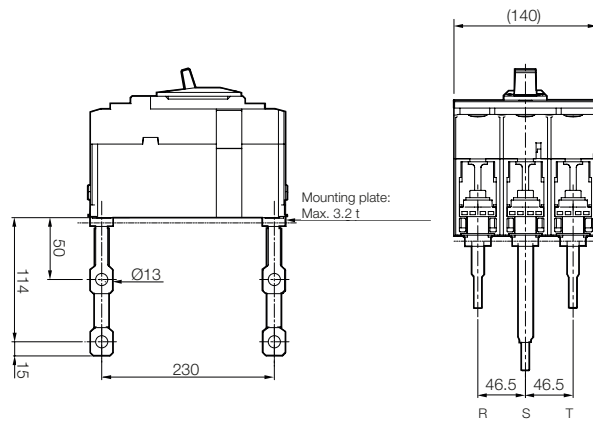
## Rear connection - straight type TTF ACW100, ACW160



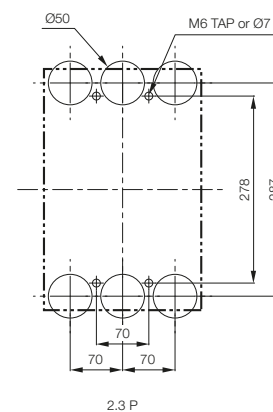
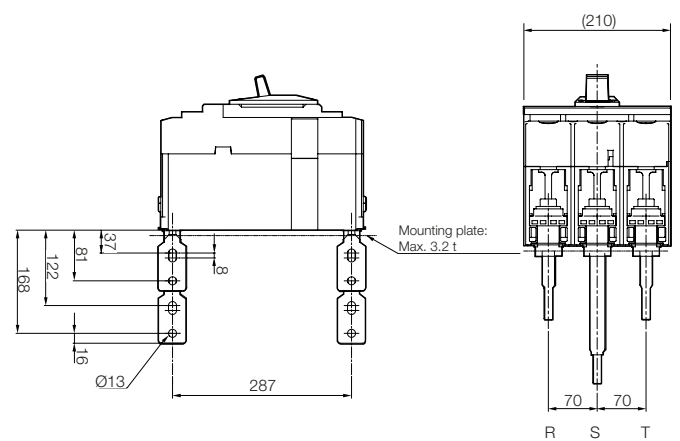
## TTF ACW101, ACW161, ACW250



## TTF ACW400, ACW630



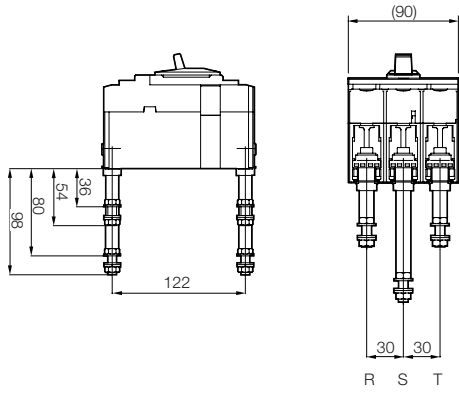
## TTF ACW800



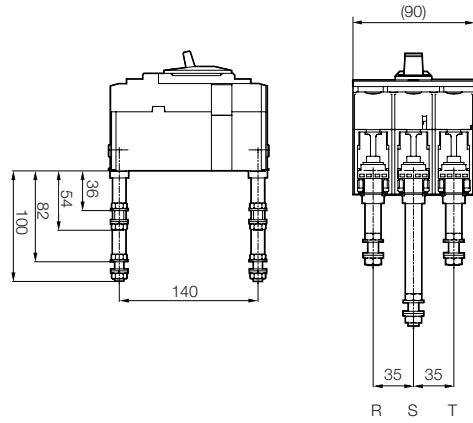
Note: dimensions in mm.

# Dimensions

## Rear connection - round type TTR ACW100, ACW160



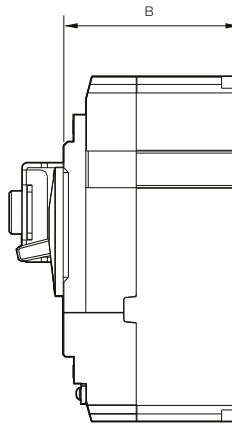
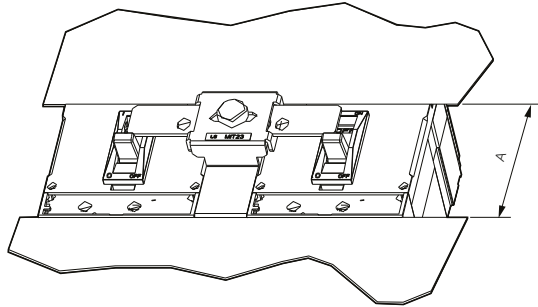
## TTR ACW101, ACW161, ACW250



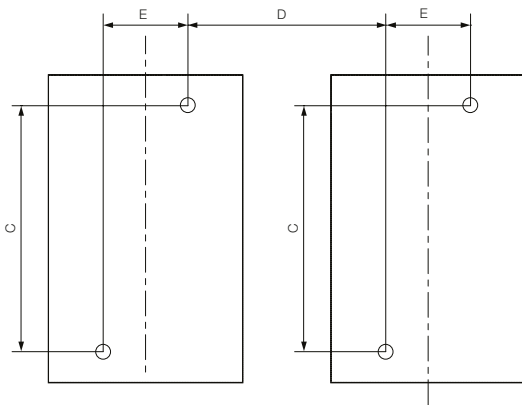
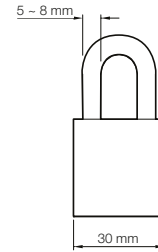
Note: dimensions in mm.

# Dimensions

## Mechanical interlock MI ACW100...800



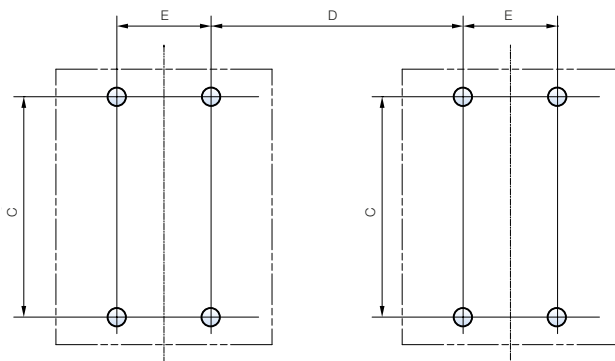
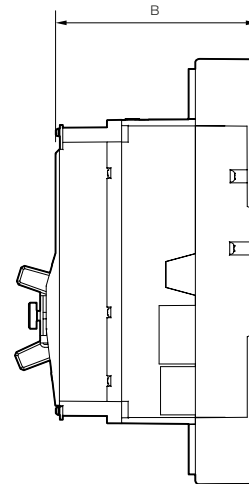
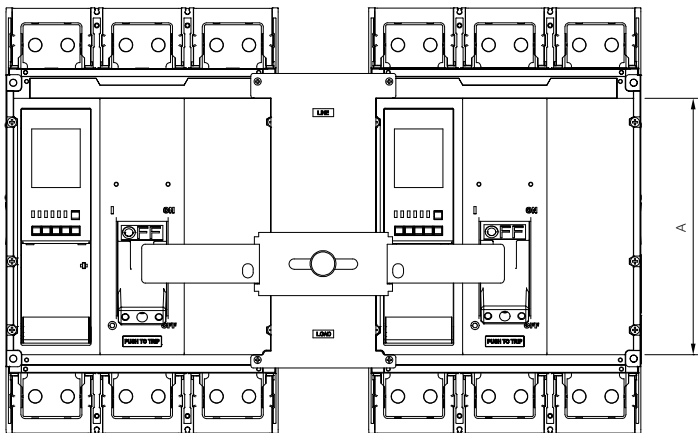
Padlock dimensions



|                        | A (mm) | B (mm) |
|------------------------|--------|--------|
| ACW100, ACW160         | 83     | 86     |
| ACW101, ACW161, ACW250 | 102    | 86     |
| ACW400, ACW630         | 168    | 110    |
| ACW800                 | 201    | 135    |

|                | C (mm) | D (mm) | E (mm) |
|----------------|--------|--------|--------|
| ACW100/160     | 107    | 90     | 30     |
| ACW100/160/250 | 125    | 105    | 35     |
| ACW400/630     | 200    | 139.5  | 46.5   |
| ACW800         | 278    | 210    | 70     |

## MI ACW1600

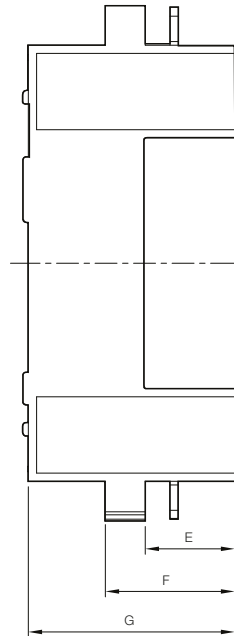
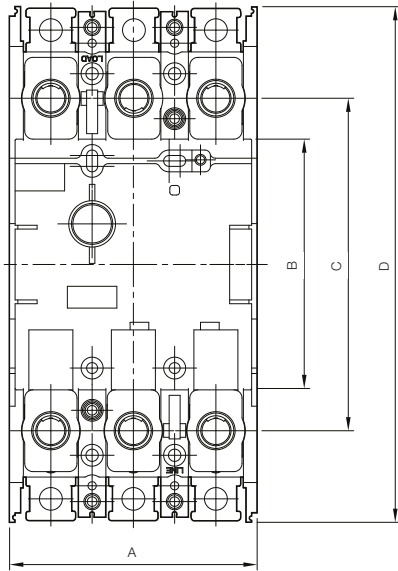


| ACW1600 | C   | D  | E   |
|---------|-----|----|-----|
|         | 212 | 81 | 199 |

Note: dimensions in mm.

# Dimensions

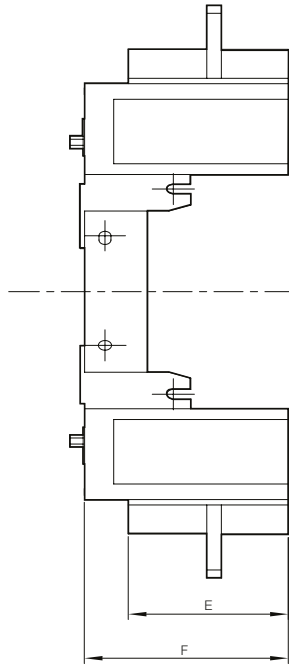
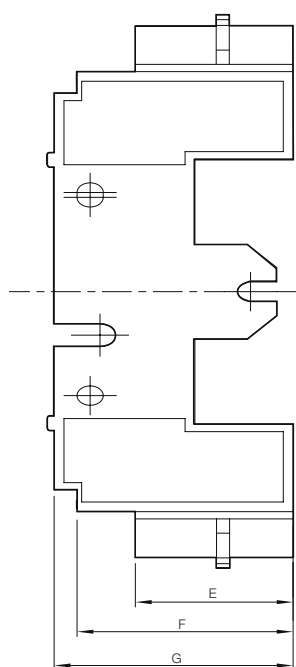
## Plug-in base PI ACW100, ACW160



ACW101 / ACW161

|        | ACW100, ACW160 |
|--------|----------------|
| A (mm) | 90             |
| B (mm) | 92             |
| C (mm) | 122            |
| D (mm) | 189.2          |
| E (mm) | 32.5           |
| F (mm) | 47             |
| G (mm) | 75             |

## PI ACW101, ACW161, ACW250, ACW400, ACW630, ACW800



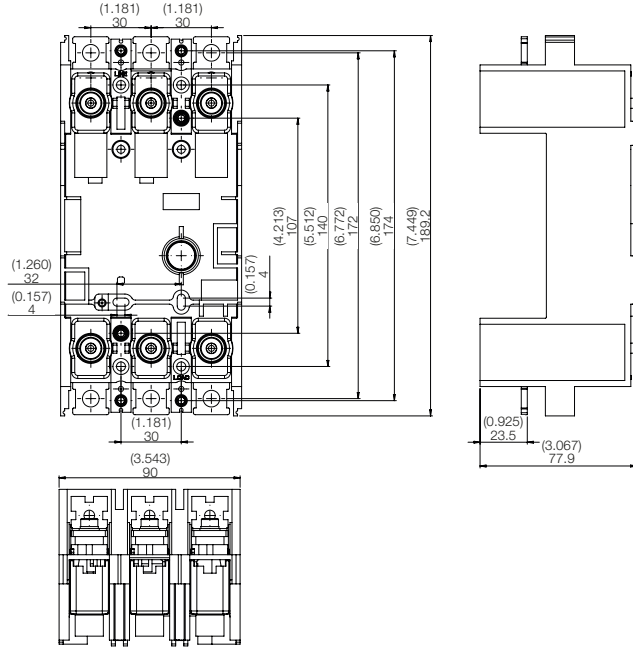
|        | ACW101<br>ACW161<br>ACW250 | ACW400<br>ACW630 | ACW800 |
|--------|----------------------------|------------------|--------|
| A (mm) | 90                         | 140              | 210    |
| B (mm) | 92                         | 186.4            | 220    |
| C (mm) | 122                        | 230              | 287    |
| D (mm) | 189.2                      | 335.2            | 451    |
| E (mm) | 32.5                       | 73               | 110    |
| F (mm) | 47                         | 94.2             | 140    |
| G (mm) | 75                         | 102              | -      |

Note: dimensions in mm.

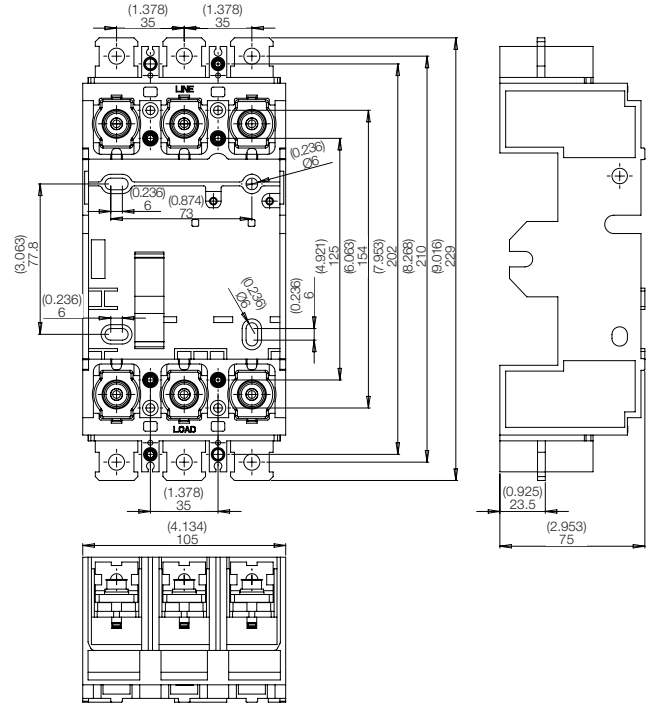


# Dimensions

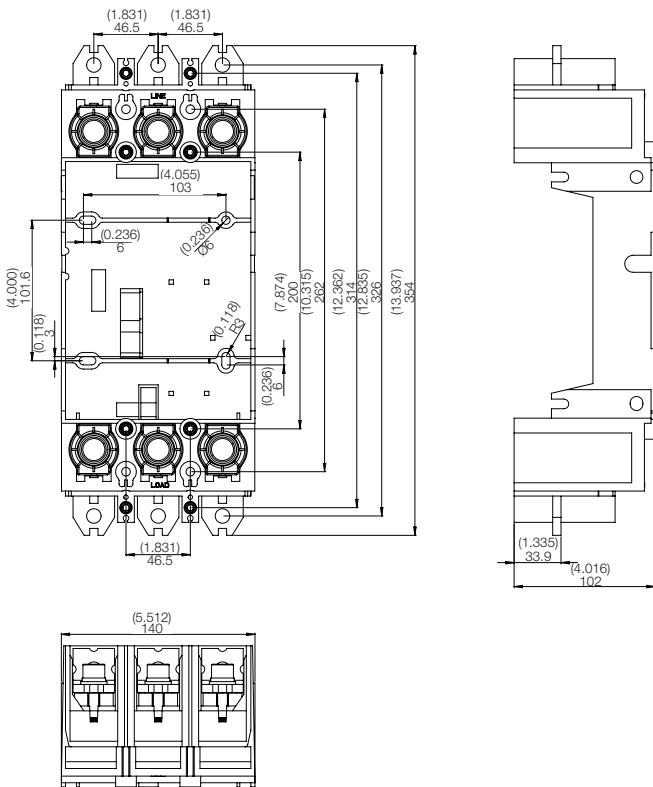
## Plug-in base PI ACW100, ACW160



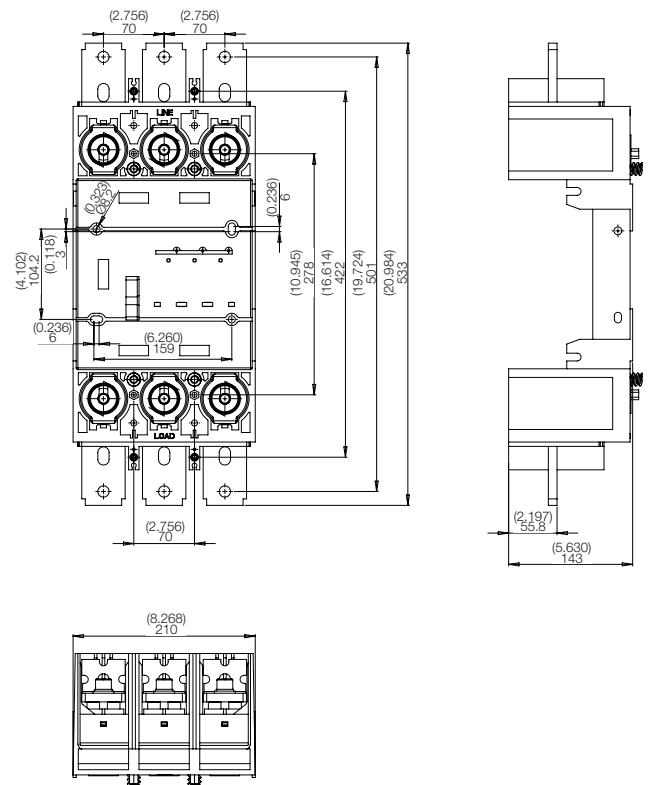
## PI ACW101, ACW161, ACW250



## PI ACW400, ACW630



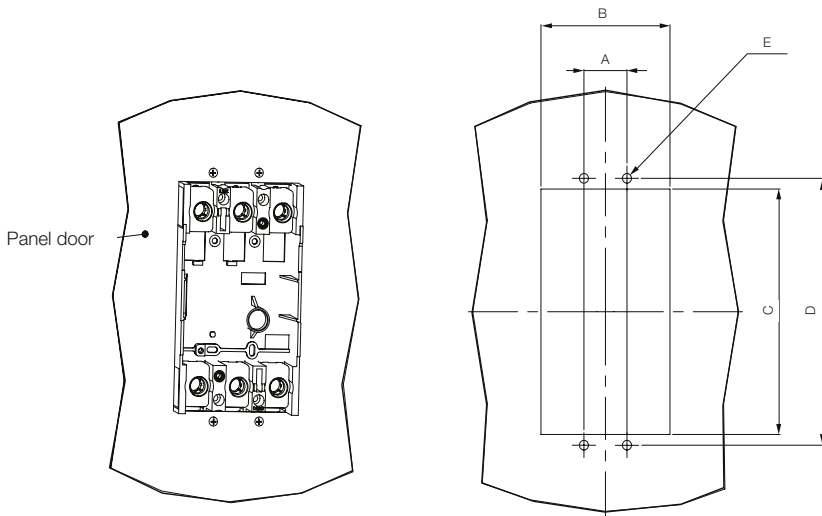
## PI ACW800



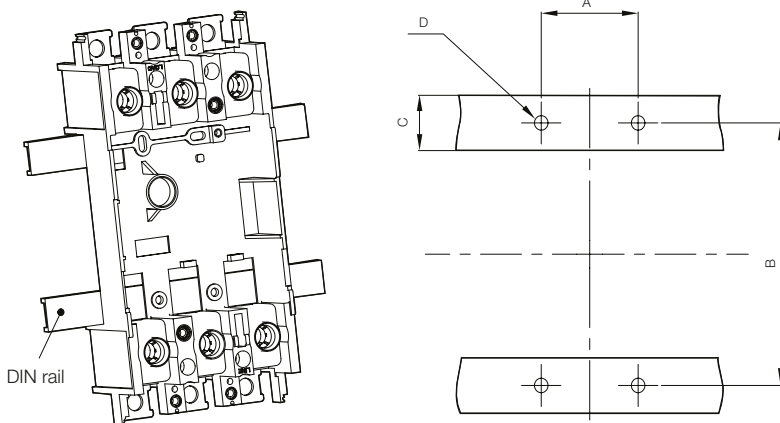
Note: dimensions in mm.

# Dimensions

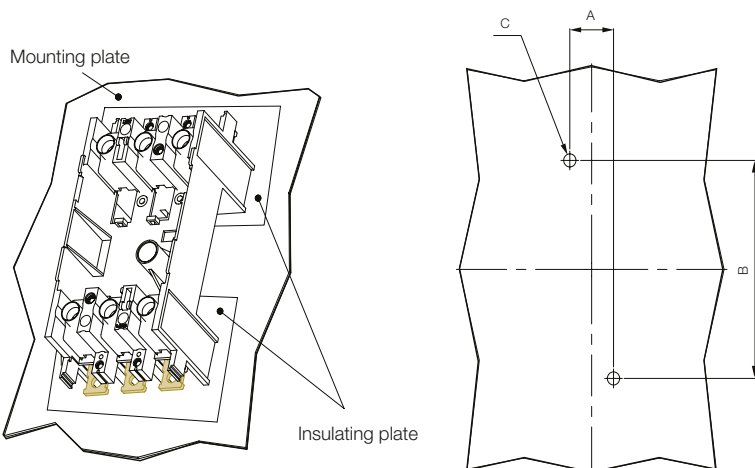
## Plug-in mounting types



|        | ACW100<br>ACW160 | ACW101<br>ACW161<br>ACW250 | ACW400<br>ACW630 | ACW800   |
|--------|------------------|----------------------------|------------------|----------|
| A (mm) | 30               | 35                         | 46.5             | 70       |
| B (mm) | 94               | 109                        | 144              | 214      |
| C (mm) | 160              | 182                        | 290              | 387      |
| D (mm) | 173              | 202                        | 314              | 422      |
| E (mm) | M4 or Ø5         | M4 or Ø5                   | M5 or Ø6         | M6 or Ø7 |



|        | ACW100<br>ACW160 | ACW101<br>ACW161<br>ACW250 | ACW400<br>ACW630 | ACW800   |
|--------|------------------|----------------------------|------------------|----------|
| A (mm) | 30               | 70                         | 100              | 156      |
| B (mm) | 76               | 77.8                       | 101.6            | 104.2    |
| C (mm) | 14               | 28                         | 32               | 43       |
| D (mm) | M4 or Ø5         | M6 or Ø7                   | M6 or Ø7         | M8 or Ø9 |



|        | ACW100<br>ACW160 | ACW101<br>ACW161<br>ACW251 | ACW400<br>ACW630 | ACW800   |
|--------|------------------|----------------------------|------------------|----------|
| A (mm) | 30               | 35                         | 46.5             | 70       |
| B (mm) | 140              | 154                        | 260              | 343      |
| C (mm) | M4 or Ø5         | M4 or Ø5                   | M5 or Ø6         | M6 or Ø7 |

Note: dimensions in mm.

# ACW circuit breakers applied in electrical systems with a frequency of 400 Hz

## 1 - ACW with thermomagnetic protection

### Thermal protection

In alternating current electrical systems the trigger threshold of the thermal element ( $I_n$ ) decreases as the frequency increases due to the reduced conductivity of the materials and the increase of associated thermal phenomena.

In this way the table below allows the calculation of the corrected  $I_n$  rated current value for the 400 Hz frequency.

New Rated Current (A) at 400 Hz =  $K_1$  (table) × Rated Current (A) at 50/60 Hz.

### Magnetic protection

In the case of the magnetic trigger, the magnetic threshold increases as the frequency increases. The table presents the correction factors for this change.

New Instantaneous Current (A) at 400 Hz =  $K_2$  × Instantaneous Current (A) at 50/60 Hz.

| Rated current (A) at 400 Hz | Circuit breaker  | Multiplier (K1 and K2)     |                             |
|-----------------------------|--|----------------------------|-----------------------------|
|                             |  | K1<br>(thermal protection) | K2<br>(magnetic protection) |
| 16                          | ACW100H-FMU;<br>ACW100V-FMU;<br>ACW160H-FMU;<br>ACW160V-FMU;<br>ACW250H-ATU;<br>ACW250V-ATU. | 0.8                        | 2                           |
| 20                          |  | 0.8                        | 2                           |
| 25                          |  | 0.8                        | 2                           |
| 32                          |  | 0.8                        | 2                           |
| 40                          |  | 0.8                        | 2                           |
| 50                          |  | 0.8                        | 2                           |
| 63                          |  | 0.8                        | 2                           |
| 80                          |  | 0.8                        | 2                           |
| 100                         |  | 0.8                        | 2                           |
| 125                         |  | 0.8                        | 2                           |
| 160                         |  | 0.8                        | 2                           |
| 200                         |  | 0.8                        | 2                           |
| 250                         |  | 0.8                        | 2                           |

- Notes: 1)  $K_1$  Factor - nominal current multiplier ( $I_n$ ).  
 2)  $K_2$  Factor - instantaneous current multiplier due to induced magnetic fields.  
 3) FMU - Fixed and adjustable thermal magnetic trigger.  
 4) ATU - Adjustable Thermal and Magnetic Trigger.

## 2 - ACW with electronic protection

The use of electronic protection offers the advantage of greater operational stability when the operating frequency is not 50/60 Hz. However, the devices are still subject to frequency-related temperature effects, which can sometimes represent restrictions on use. Column  $K_1$  of the table below provides the maximum permissible current to be used for 400 Hz (position of the current setting knob).

| Rated current (A) at 400 Hz | Circuit breaker  | Multiplier (K1 and K2)     |                             |
|-----------------------------|--|----------------------------|-----------------------------|
|                             |  | K1<br>(thermal protection) | K2<br>(magnetic protection) |
| 40                          | ACW101H-ETS;<br>ACW101V-ETS;<br>ACW161H-ETS;<br>ACW161V-ETS;<br>ACW250H-ETS;<br>ACW250V-ETS;<br>ACW400H-ETS;<br>ACW400V-ETS;<br>ACW630H-ETS;<br>ACW630V-ETS;<br>ACW800U-ETS;<br>ACW400H-ETM;<br>ACW630H-ETM;<br>ACW800U-ETM. | 0.4 to 1                   | 1                           |
| 80                          |  | 0.4 to 1                   | 1                           |
| 160                         |  | 0.4 to 0.9                 | 1                           |
| 250                         |  | 0.4 to 0.9                 | 1                           |
| 400                         |  | 0.4 to 0.8                 | 1                           |
| 630                         |  | 0.4 to 0.8                 | 1                           |
| 800                         |  | 0.4 to 0.75                | 0.97                        |

- Notes: 1)  $K_1$  - permissible setting range in 400 Hz of the nominal current ( $I_n$ ).  
 2)  $K_2$  Factor - instantaneous current multiplier due to induced magnetic fields.  
 3) ETS - Electronic Trigger (standard).  
 4) ETM - Electronic (multifunction) Trigger.

# ACW circuit breakers applied in low voltage transformer - primary use

Transformers are used to change in the supply voltage, for both medium and low voltage supplies. The choice of the protection devices should be considered transient insertion phenomena, during which the current may reach values higher than the rated full load current; the phenomenon decays in a few seconds.

The peak value of the first half cycle may reach values of 15 to 25 times the effective rated current. For a protective device capable of protection these units this must be taken into account. Manufacturers data and tests have indicated that a protective device feeding a transformer must be capable of carrying the following current values without tripping.

## ACW100/160/101/161/250/400/630/800 equipped with thermal magnetic trip units

| Transformer ratings (kVA) |                                |               | MCCB rated current (A) | Trip unit  |
|---------------------------|--------------------------------|---------------|------------------------|------------|
| 1 phase 230 V             | 3 phase 230 V<br>1 phase 240 V | 1 phase 230 V |                        |            |
| 3 to 4                    | 5 to 6                         | 9 to 11       | 16                     | FMU<br>ATU |
| 4 to 5                    | 6 to 8                         | 11 to 14      | 20                     |            |
| 5 to 6                    | 8 to 10                        | 14 to 17      | 25                     |            |
| 6 to 7                    | 10 to 13                       | 18 to 22      | 32                     |            |
| 7 to 9                    | 13 to 16                       | 22 to 28      | 40                     |            |
| 9 to 12                   | 16 to 20                       | 28 to 35      | 50                     |            |
| 12 to 14                  | 20 to 25                       | 35 to 44      | 63                     |            |
| 15 to 18                  | 26 to 32                       | 44 to 55      | 80                     |            |
| 18 to 23                  | 32 to 40                       | 55 to 69      | 100                    |            |
| 23 to 29                  | 40 to 50                       | 69 to 87      | 125                    |            |
| 29 to 37                  | 51 to 64                       | 89 to 111     | 160                    |            |
| 37 to 47                  | 64 to 80                       | 111 to 138    | 200                    |            |
| 46 to 58                  | 80 to 100                      | 138 to 173    | 250                    |            |
| 55 to 69                  | 96 to 120                      | 166 to 208    | 300                    |            |
| 74 to 92                  | 128 to 160                     | 221 to 277    | 400                    |            |
| 92 to 115                 | 160 to 200                     | 277 to 346    | 500                    |            |
| 116 to 145                | 202 to 252                     | 349 to 436    | 630                    |            |
| 129 to 161                | 224 to 280                     | 388 to 484    | 700                    |            |
| 147 to 184                | 256 to 320                     | 443 to 554    | 800                    |            |

## Coordination 2, cascading and selectivity guide

Association of protection with motor starting components and association of different protection devices.

Electric Circuit and Motor Switching and Protection Guide – Coordination, Cascading y Selectivity. Check it out at:



WEG website




Direct link to file




# Circuit breakers overview

| Dimensions<br>(frames) | Currents<br>(A) | Thermomagnetic<br>Protection | Electronic<br>Protection | Breaking<br>capacity<br>$I_{cu}$ @ 380 V <sub>AC</sub> |
|------------------------|-----------------|------------------------------|--------------------------|--|
|------------------------|-----------------|------------------------------|--------------------------|--|


MDW, MDWP<sup>1)</sup> miniature circuit breaker

|   |         |           |       |   |   |
|---|---------|-----------|-------|---|---|
|  | Frame 1 | 2 to 63   | Fixed | - | 3 |
|   | Frame 2 | 70 to 125 |       |   |   |


MDWH miniature circuit breaker<sup>2)</sup>

|   |         |           |       |   |                  |
|---|---------|-----------|-------|---|------------------|
|  | Frame 1 | 6 to 63   | Fixed | - | 10 <sup>1)</sup> |
|   | Frame 2 | 70 to 125 |       |   |                  |

AGW molded case circuit breaker

|   |        |            |       |   |         |
|---|--------|------------|-------|---|---------|
|  | 50/100 | 15 to 100  | Fixed | - | 18 - 22 |
|   | 250    | 125 to 250 |       |   | 30      |
|   | 400    | 250 to 240 |       |   | 42      |
|   | 800    | 500 to 800 |       |   | 45      |

DW molded case circuit breaker

|   |          |                |                      |   |         |
|---|----------|----------------|----------------------|---|---------|
|  | 160      | 16 to 160      | Fixed and adjustable | - | 18 - 80 |
|   | 250      | 100 to 250     |                      |   | 18 - 80 |
|   | 400      | 200 to 400     |                      |   | 35 - 65 |
|   | 800/1000 | 320 to 1,000   |                      |   | 35 - 65 |
|   | 1600     | 1,250 to 1,600 |                      |   | 50 - 65 |

ACW high-capacity molded case circuit breaker

|   |             |              |                      |   |          |
|---|-------------|--------------|----------------------|---|----------|
|  | 100/160     | 20 to 160    | Fixed and adjustable | - | 85 - 150 |
|   | 101/161/250 | 16 to 250    |                      |   | 85 - 150 |
|   | 400/630     | 160 to 400   |                      |   | 85 - 150 |
|   | 800         | 630 to 800   |                      |   | 85 - 150 |
|   | 1600        | 800 to 1,600 |                      |   | 100      |

ABW/ABWC air circuit breaker

|   |                |                |   |            |     |
|---|----------------|----------------|---|------------|-----|
|  | 800/1600       | 320 to 1,600   | - | Adjustable | 65  |
|   | 2000/2500/3200 | 800 to 3,200   |   |            | 85  |
|   | 4000/5000      | 1,600 to 5,000 |   |            | 100 |
|   | 6300           | 2,520 to 6,300 |   |            | 120 |

Notes: 1) Up to 63 A nominal current.  
2) MDWH at 220 V<sub>AC</sub>  $I_{cu}$  = 20 kA.

# Global presence

is essential, as much as understanding your needs.



## Global Presence

With more than 40,000 employees worldwide, WEG is one of the largest electric motors, electronic equipments and systems manufacturers. We are constantly expanding our portfolio of products and services with expertise and market knowledge. We create integrated and customized solutions ranging from innovative products to complete after-sales service.

WEG's know-how guarantees our **ACW - Molded Case Circuit Breaker** are the right choice for your application and business, assuring safety, efficiency and reliability.



**Availability** is to have a global support network



**Partnership** is to create solutions that suits your needs

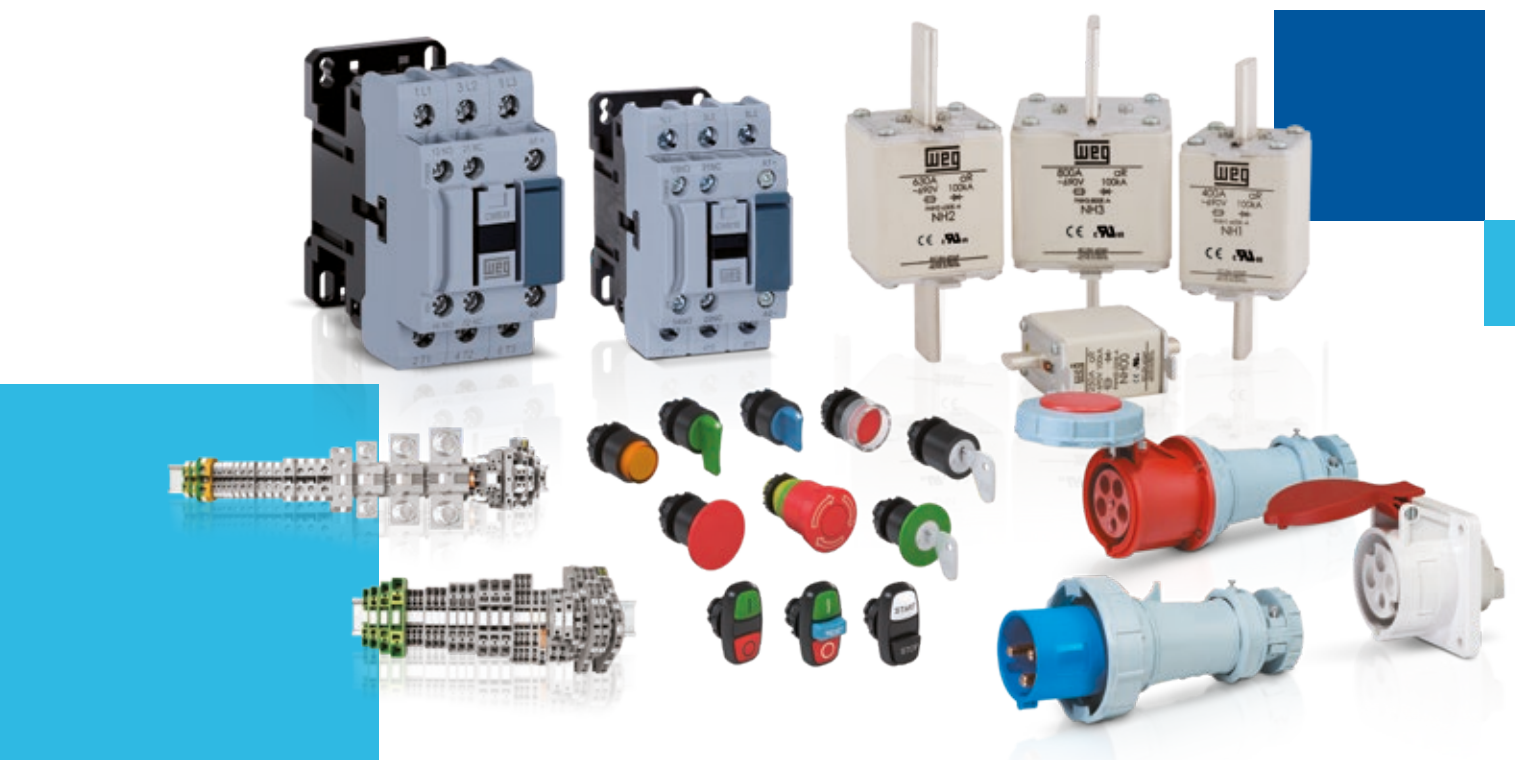


**Competitive edge** is to unite technology and innovation



# Know More

High performance and reliable products to improve your production process.



Excellence is to provide a whole solution in industrial automation that improves our customers productivity.

Visit: [www.weg.net](http://www.weg.net)

 [youtube.com/wegvideos](https://youtube.com/wegvideos)

The scope of WEG Group solutions is not limited to products and solutions presented in this catalogue.

**To see our portfolio, contact us.**


**For WEG's worldwide operations visit our website**




**[www.weg.net](http://www.weg.net)**



 +55 47 3276.4000

 [automacao@weg.net](mailto:automacao@weg.net)

 Jaraguá do Sul - SC - Brazil

Cod: 50029482 | Rev: 12 | Date (m/y): 09/2024.

The values shown are subject to change without prior notice.  
The information contained is reference values.