

## RCCBs - Residual current circuit breakers EFI

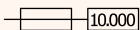
Residual current circuit breakers can be used in TN-S, TN-CS, TT and IT network systems, or with other words, in all systems where neutral and protective conductors are separated. Residual current circuit breakers EFI are used for protection against indirect contact (fault protection) and direct contact (additional protection) of parts under voltage. In the case of protection against indirect contact (fault protection) you can use residual current protective devices with a rated residual current of  $I_{\Delta n} \leq 300\text{mA}$ . Residual current protective devices with a rated residual current of  $I_{\Delta n} \leq 30\text{mA}$  fulfil the conditions for protection against direct contact (additional protection). For protection against fire, according to DIN VDE 0100-482 and IEC 60364-4-482, all cables and conductors in TN and TT systems must be protected by means of residual current protective devices with rated residual current of  $I_{\Delta n} \leq 300\text{mA}$ . In applications where resistive faults can cause a fire (radiant ceiling heating with panel heating elements), the rated residual current must be  $I_{\Delta n} = 30\text{mA}$ .

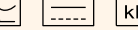
### Types

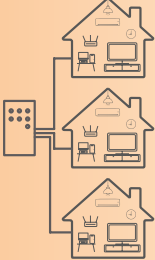
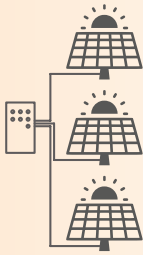
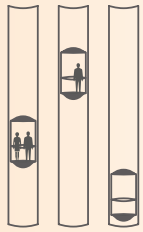
- **AC Type:** they are sensitive to alternating (sinusoidal) AC residual currents.
- **A Type:** they are sensitive to alternating (sinusoidal) AC residual currents and pulsating DC residual currents.
- **B Type:** they are sensitive to alternating (sinusoidal) AC residual currents, pulsating DC residual currents and smooth DC residual currents. Tripping values are defined up to 1 kHz.
- **B+ Type:** they are sensitive to alternating (sinusoidal) AC residual currents, pulsating DC residual currents and smooth DC residual currents. Tripping values are defined up to 20kHz and they are below 420mA.

### Classification regarding break time

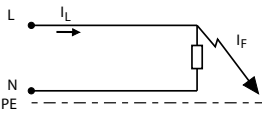
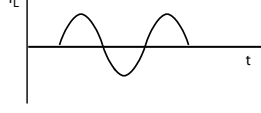
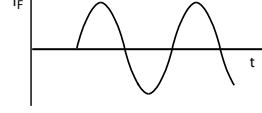
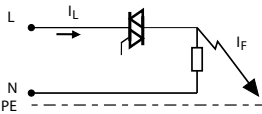
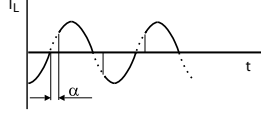
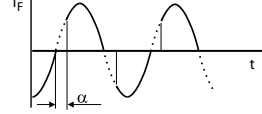
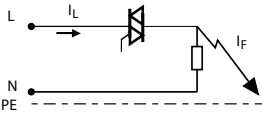
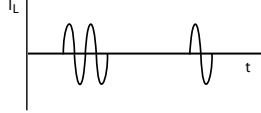
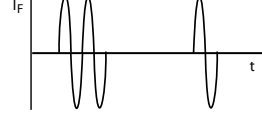
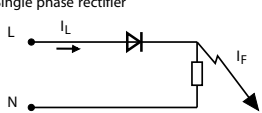
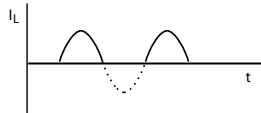
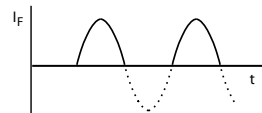
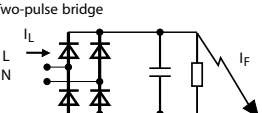
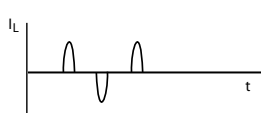
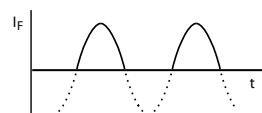
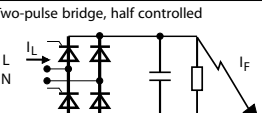
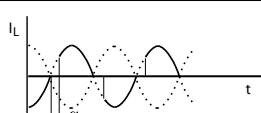
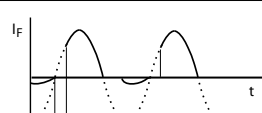
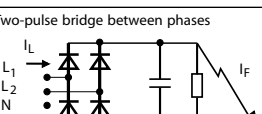
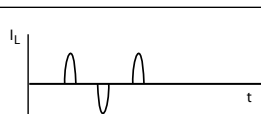
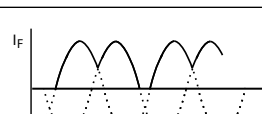
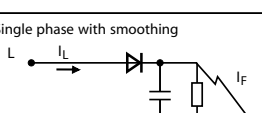
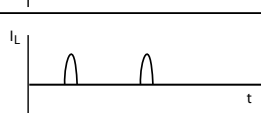
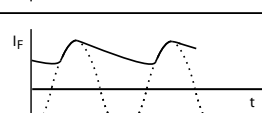
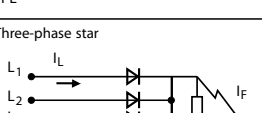
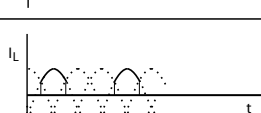
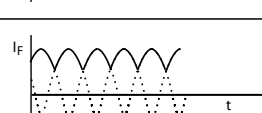
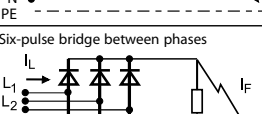
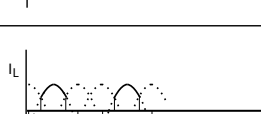
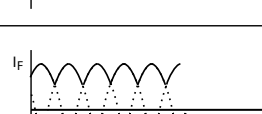
- **Instantaneous:** max. break time 40ms (Inst.)
- **G/KV-Short time delay:** time delayed min. 10ms and max. 40ms (G/KV)
- **S-Selective:** time delayed min. 40ms and max. 150ms (S)

| EFI 2 (2M)                                                                          |                                                       | Type AC<br>Inst. | Inst. | Type A<br>G/KV | S |
|-------------------------------------------------------------------------------------|-------------------------------------------------------|------------------|-------|----------------|---|
|  | For alternating residual current                      | ✓                | ✓     | ✓              | ✓ |
|  | For alternating and pulsating direct residual current |                  | ✓     | ✓              | ✓ |
|  | Short-circuit capacity with back-up fuse              | ✓                | ✓     | ✓              | ✓ |
|  | Lower temperature limit of application -25°C          | ✓                | ✓     | ✓              | ✓ |
|  | VDE 0664, part 1 (up to 80 A)                         |                  | ✓     |                | ✓ |
|  | Short time delayed (10 - 40 ms)                       |                  |       | ✓              |   |
|  | Selective (time delayed 40 - 150 ms)                  |                  |       |                | ✓ |

| EFI 4 (4M)                                                                                                                                                                                                                                                  |                                                                                | Type AC<br>Inst. | Inst. | Type A<br>G/KV | S | Type B<br>Inst. | G/KV | S | Type B+<br>Inst. | G/KV | S |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|------------------|-------|----------------|---|-----------------|------|---|------------------|------|---|
|                                                                                                                                                                          | For alternating residual current                                               | ✓                | ✓     | ✓              | ✓ | ✓               | ✓    | ✓ | ✓                | ✓    | ✓ |
|                                                                                                                                                                          | For alternating and pulsating direct residual current                          |                  | ✓     | ✓              | ✓ | ✓               | ✓    | ✓ | ✓                | ✓    | ✓ |
|    | For alternating, pulsating direct and smooth DC residual current (up to 1kHz)  |                  |       |                |   | ✓               | ✓    | ✓ | ✓                | ✓    | ✓ |
|    | For alternating, pulsating direct and smooth DC residual current (up to 20kHz) |                  |       |                |   |                 |      |   | ✓                | ✓    | ✓ |
|                                                                                                                                                                          | Short-circuit capacity with back-up fuse                                       | ✓                | ✓     | ✓              | ✓ | ✓               | ✓    | ✓ | ✓                | ✓    | ✓ |
|                                                                                                                                                                          | Lower temperature limit of application -25°C                                   | ✓                | ✓     | ✓              | ✓ | ✓               | ✓    | ✓ | ✓                | ✓    | ✓ |
|                                                                                                                                                                          | VDE 0664, part 1 (up to 80 A)                                                  |                  | ✓     |                | ✓ | ✓               |      | ✓ | ✓                |      | ✓ |
|                                                                                                                                                                          | Short time delayed (10 - 40 ms)                                                |                  |       | ✓              |   |                 | ✓    |   |                  | ✓    |   |
|                                                                                                                                                                          | Selective (time delayed 40 - 150 ms)                                           |                  |       |                | ✓ |                 |      | ✓ |                  |      | ✓ |

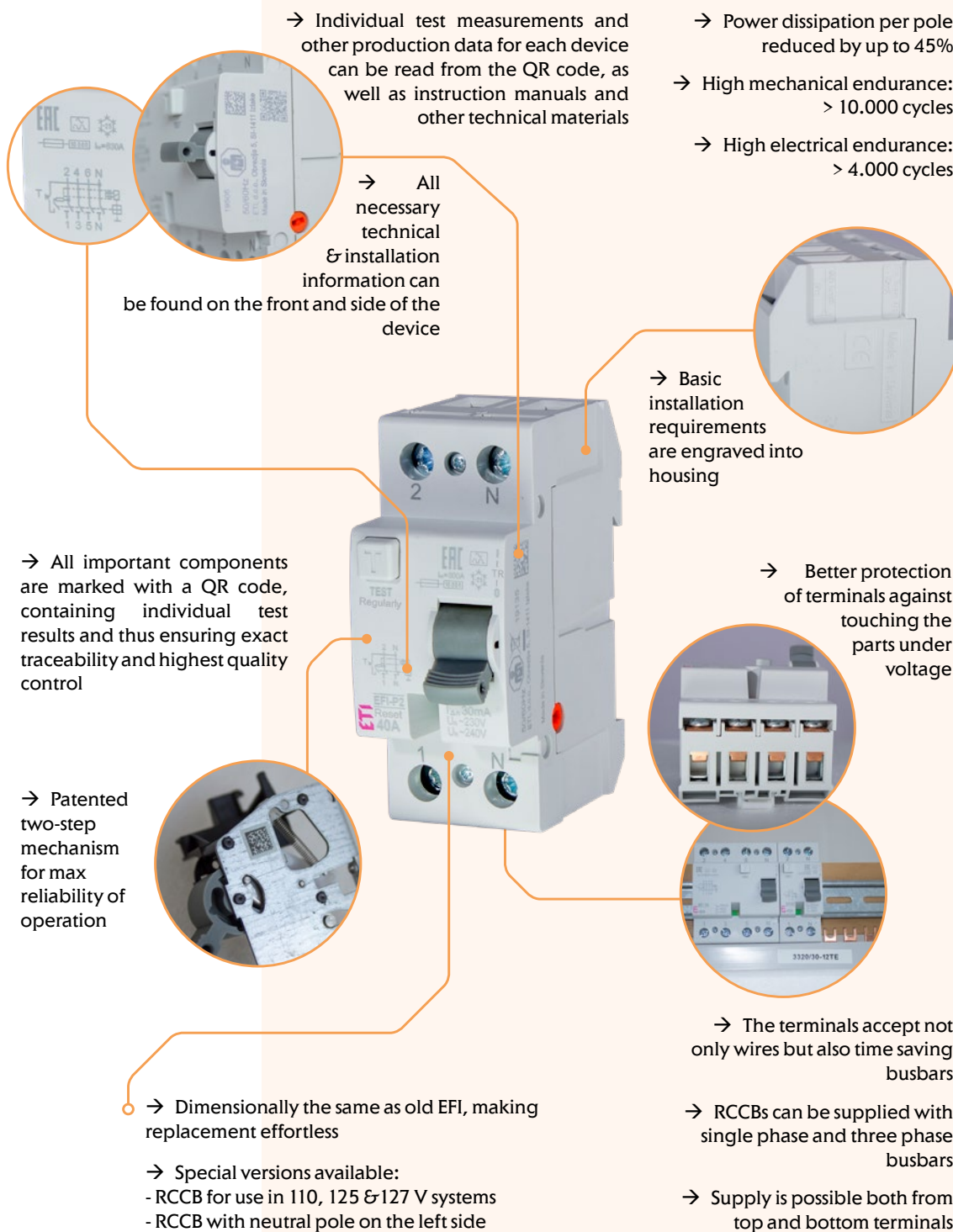
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                               |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Simple household installations without electronic components</p>  <p><b>AC type - Instantaneous</b><br/><b>2p / 4p</b><br/><math>I_n = 25, 32, 40, 63, 80, 100 \text{ A}</math><br/><math>I_{\Delta n} = 30, 100, 300, 500 \text{ mA}</math></p> <p><b>A type - Instantaneous</b><br/><b>2p / 4p</b><br/><math>I_n = 25, 40, 63, 80, 100 \text{ A}</math><br/><math>I_{\Delta n} = 30, 100, 300, 500 \text{ mA}</math></p> <p><b>A type - G/KV</b> (short-time delay: time delayed min. 10ms and max. 40ms) &amp; <b>S</b> (selective: time delayed min. 40ms and max. 150ms)<br/><b>2p / 4p</b><br/><math>I_n = 25, 40, 63, 80, 100 \text{ A}</math><br/><math>I_{\Delta n} = 100, 300 \text{ mA}</math></p> <p><b>B type – Instantaneous</b> (Tripping values are defined up to 1kHz)<br/><b>4p</b><br/><math>I_n = 25, 40, 63 \text{ A}</math><br/><math>I_{\Delta n} = 30, 100, 300 \text{ mA}</math></p> <p><b>B type - G/KV</b> (short-time delay: time delayed min. 10ms and max. 40ms) &amp; <b>S</b> (selective: time delayed min. 40ms and max. 150ms)<br/><b>4p</b><br/><math>I_n = 25, 40, 63 \text{ A}</math><br/><math>I_{\Delta n} = 100, 300 \text{ mA}</math></p> <p><b>B+ type – Instantaneous</b> (Tripping values are defined up to 20kHz and they are below 420mA) according to VDE 0664-400<br/><b>4p</b><br/><math>I_n = 25, 40, 63 \text{ A}</math><br/><math>I_{\Delta n} = 30, 100, 300 \text{ mA}</math></p> | <p>Household installations with electronic components (LCD TV, computers, printers, wash machines, ...)</p>  | <p>Surge current proof 3kA (8/20μs). High immunity against unwanted tripping. For S: ensuring selectivity in case of serially connected RCD's</p>  | <p>Installations where 3f frequency converters and speed regulated machines are used (elevators, cranes). PV systems on a.c. side, Charging stations for electric vehicles, UPS, computer data centres, X-ray devices</p>    | <p>Surge current proof 3kA (8/20μs) High immunity against unwanted tripping. For S: ensuring selectivity in case of serially connected RCD's</p>   | <p>Requirement for increased fire protection according to VDE 0664-400</p>     |
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# Use of AC, A, and B type of RCCB's in case of different fault conditions

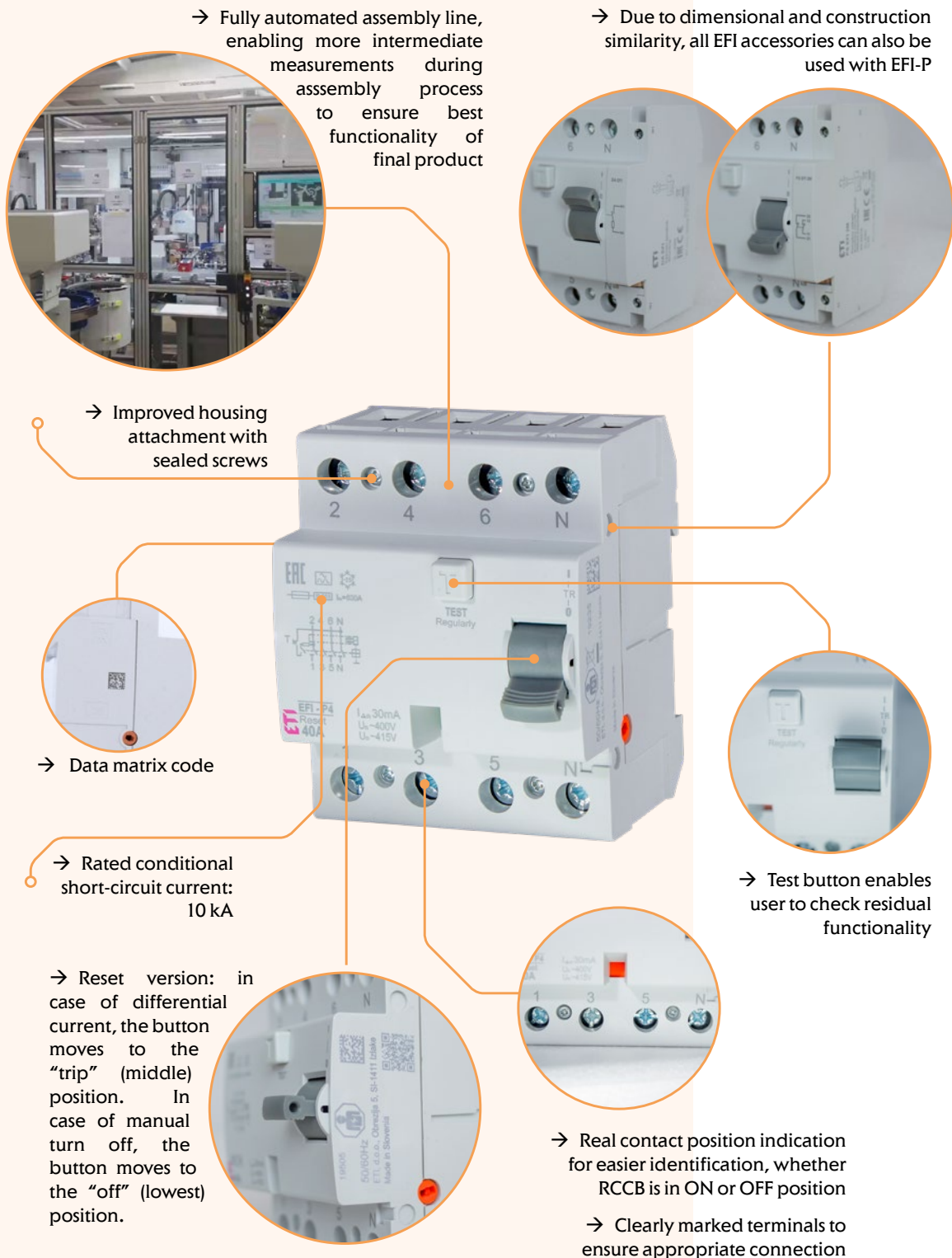
|    |                                                                                                                          |                                                                                     |                                                                                      | AC                                                                                  | A                                                                                   | B, B+                                                                               |
|----|--------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|    |                                                                                                                          |                                                                                     |                                                                                      |  |  |  |
|    | Connection                                                                                                               | Normal mains current                                                                | Fault earth current                                                                  |                                                                                     |                                                                                     |                                                                                     |
| 1  | Single phase<br>                        |    |    | ✓                                                                                   | ✓                                                                                   | ✓                                                                                   |
| 2  | Phase control<br>                       |    |    | ✓                                                                                   | ✓                                                                                   | ✓                                                                                   |
| 3  | Burst control<br>                       |    |    | ✓                                                                                   | ✓                                                                                   | ✓                                                                                   |
| 4  | Single phase rectifier<br>             |   |   |                                                                                     | ✓                                                                                   | ✓                                                                                   |
| 5  | Two-pulse bridge<br>                  |  |  |                                                                                     | ✓                                                                                   | ✓                                                                                   |
| 6  | Two-pulse bridge, half controlled<br> |  |  |                                                                                     | ✓                                                                                   | ✓                                                                                   |
| 7  | Two-pulse bridge between phases<br>   |  |  |                                                                                     | ✓                                                                                   | ✓                                                                                   |
| 8  | Single phase with smoothing<br>       |  |  |                                                                                     |                                                                                     | ✓                                                                                   |
| 9  | Three-phase star<br>                  |  |  |                                                                                     |                                                                                     | ✓                                                                                   |
| 10 | Six-pulse bridge between phases<br>   |  |  |                                                                                     |                                                                                     | ✓                                                                                   |

## NEW EFI - P

## Features of residual current circuit breakers EFI-P



## Residual current circuit breakers



## A and AC type residual current circuit breaker EFI-P2(R) &amp; EFI-2

Rated residual current  
**0,03 - 0,5 A**Rated current  
**16 - 100 A**Type  
**A, AC**

16 - 80 A



100 A



G/KV



S

## EFI-P2 Instantaneous, EFI-P2R Instantaneous

| I <sub>n</sub><br>[A] | I <sub>Δn</sub><br>[A] | Number<br>of poles | Type A     |           |           |           | Type AC    | Weight<br>[g] | Packaging<br>[pcs] |
|-----------------------|------------------------|--------------------|------------|-----------|-----------|-----------|------------|---------------|--------------------|
|                       |                        |                    |            | Reset**   | 127V***   | NL****    |            |               |                    |
| 16                    | 0,03                   | 2                  | 002061110  | 002061460 | 002061350 | 002061410 | 002061210  | 175           | 1/54               |
| 25                    | 0,03                   | 2                  | 002061111  | 002061461 | 002061351 | 002061411 | 002061211  | 175           | 1/54               |
| 40                    | 0,03                   | 2                  | 002061112  | 002061462 | 002061352 | 002061412 | 002061212  | 175           | 1/54               |
| 63                    | 0,03                   | 2                  | 002061113  | 002061463 | 002061353 | 002061413 | 002061213  | 190           | 1/54               |
| 80                    | 0,03                   | 2                  | 002061114  | 002061464 | 002061354 | 002061414 | 002061214  | 190           | 1/54               |
| 100                   | 0,03                   | 2                  | 002062530* | -         | -         | -         | 002062531* | 244           | 1/54               |
| 16                    | 0,1                    | 2                  | 002061120  | 002061470 | 002061360 | 002061420 | 002061220  | 175           | 1/54               |
| 25                    | 0,1                    | 2                  | 002061121  | 002061471 | 002061361 | 002061421 | 002061221  | 175           | 1/54               |
| 40                    | 0,1                    | 2                  | 002061122  | 002061472 | 002061362 | 002061422 | 002061222  | 175           | 1/54               |
| 63                    | 0,1                    | 2                  | 002061123  | 002061473 | 002061363 | 002061423 | 002061223  | 190           | 1/54               |
| 80                    | 0,1                    | 2                  | 002061124  | 002061474 | 002061364 | 002061424 | 002061224  | 190           | 1/54               |
| 100                   | 0,1                    | 2                  | 002062532* | -         | -         | -         | 002062533* | 230           | 1/54               |
| 16                    | 0,3                    | 2                  | 002061130  | 002061480 | 002061370 | 002061430 | 002061230  | 175           | 1/54               |
| 25                    | 0,3                    | 2                  | 002061131  | 002061481 | 002061371 | 002061431 | 002061231  | 175           | 1/54               |
| 40                    | 0,3                    | 2                  | 002061132  | 002061482 | 002061372 | 002061432 | 002061232  | 175           | 1/54               |
| 63                    | 0,3                    | 2                  | 002061133  | 002061483 | 002061373 | 002061433 | 002061233  | 190           | 1/54               |
| 80                    | 0,3                    | 2                  | 002061134  | 002061484 | 002061374 | 002061434 | 002061234  | 190           | 1/54               |
| 100                   | 0,3                    | 2                  | 002062534* | -         | -         | -         | 002062535* | 230           | 1/54               |
| 16                    | 0,5                    | 2                  | 002061140  | 002061490 | -         | -         | 002061240  | 175           | 1/54               |
| 25                    | 0,5                    | 2                  | 002061141  | 002061491 | -         | -         | 002061241  | 175           | 1/54               |
| 40                    | 0,5                    | 2                  | 002061142  | 002061492 | -         | -         | 002061242  | 175           | 1/54               |
| 63                    | 0,5                    | 2                  | 002061143  | 002061493 | -         | -         | 002061243  | 190           | 1/54               |
| 80                    | 0,5                    | 2                  | 002061144  | 002061494 | -         | -         | 002061244  | 190           | 1/54               |

\* Old version (EFI-2)

\*\* Reset version: in case of differential current, the button moves to the "trip" (middle) position. In case of manual turn off, the button moves to the "off" (lowest) position.

\*\*\* For use in lower than standard system voltage (for instance 110V, 125V or 127V) system

\*\*\*\* Version with N-pole on the left side

## EFI-2 Short time delay &amp; Selective

| I <sub>n</sub><br>[A] | I <sub>Δn</sub><br>[A] | Number<br>of poles | Type A                |             | Weight<br>[g] | Packaging<br>[pcs] |
|-----------------------|------------------------|--------------------|-----------------------|-------------|---------------|--------------------|
|                       |                        |                    | G/KV-Short time delay | S-Selective |               |                    |
| 25                    | 0,03                   | 2                  | 002062727             | -           | 197           | 1/54               |
| 40                    | 0,03                   | 2                  | 002062728             | -           | 197           | 1/54               |
| 63                    | 0,03                   | 2                  | 002062729             | -           | 206           | 1/54               |
| 25                    | 0,1                    | 2                  | 002063727             | 002063732   | 193           | 1/54               |
| 40                    | 0,1                    | 2                  | 002063728             | 002063733   | 193           | 1/54               |
| 63                    | 0,1                    | 2                  | 002063729             | 002063734   | 196           | 1/54               |
| 100                   | 0,1                    | 2                  | -                     | 002062501   | 230           | 1/54               |
| 25                    | 0,3                    | 2                  | 002064727             | 002064732   | 198           | 1/54               |
| 40                    | 0,3                    | 2                  | 002064728             | 002064733   | 198           | 1/54               |
| 63                    | 0,3                    | 2                  | 002064729             | 002064734   | 204           | 1/54               |
| 100                   | 0,3                    | 2                  | -                     | 002062502   | 230           | 1/54               |

## Residual current circuit breakers

## A and AC type residual current circuit breaker EFI-P4(R) &amp; EFI-4

Rated residual current  
**0,03 - 0,5 A**

Rated current  
**16 - 100 A**

Type  
**A, AC**

## EFI-P4 Instantaneous, EFI-P4R Instantaneous

| I <sub>n</sub><br>[A] | I <sub>Δn</sub><br>[A] | Number<br>of poles | Type A     |           |           | Type AC   | Weight<br>[g] | Packaging<br>[pcs] |
|-----------------------|------------------------|--------------------|------------|-----------|-----------|-----------|---------------|--------------------|
|                       |                        |                    |            | Reset**   | 127V***   | NL****    |               |                    |
| 16                    | 0,03                   | 4                  | 002061510  | 002061860 | 002061750 | 002061810 | 002061610     | 300                |
| 25                    | 0,03                   | 4                  | 002061511  | 002061861 | 002061751 | 002061811 | 002061611     | 300                |
| 40                    | 0,03                   | 4                  | 002061512  | 002061862 | 002061752 | 002061812 | 002061612     | 300                |
| 63                    | 0,03                   | 4                  | 002061513  | 002061863 | 002061753 | 002061813 | 002061613     | 330                |
| 80                    | 0,03                   | 4                  | 002062545* | -         | -         | -         | 002062145*    | 380                |
| 100                   | 0,03                   | 4                  | 002062150* | -         | -         | -         | 002062151*    | 244                |
| 16                    | 0,1                    | 4                  | 002061520  | 002061870 | 002061760 | 002061820 | 002061620     | 300                |
| 25                    | 0,1                    | 4                  | 002061521  | 002061871 | 002061761 | 002061821 | 002061621     | 300                |
| 40                    | 0,1                    | 4                  | 002061522  | 002061872 | 002061762 | 002061822 | 002061622     | 300                |
| 63                    | 0,1                    | 4                  | 002061523  | 002061873 | 002061763 | 002061823 | 002061623     | 330                |
| 80                    | 0,1                    | 4                  | 002063545* | -         | -         | -         | 002063145*    | 380                |
| 100                   | 0,1                    | 4                  | 002062152* | -         | -         | -         | 002062153*    | 230                |
| 16                    | 0,3                    | 4                  | 002061530  | 002061880 | 002061770 | 002061830 | 002061630     | 300                |
| 25                    | 0,3                    | 4                  | 002061531  | 002061881 | 002061771 | 002061831 | 002061631     | 300                |
| 40                    | 0,3                    | 4                  | 002061532  | 002061882 | 002061772 | 002061832 | 002061632     | 300                |
| 63                    | 0,3                    | 4                  | 002061533  | 002061883 | 002061773 | 002061833 | 002061633     | 330                |
| 80                    | 0,3                    | 4                  | 002064545* | -         | -         | -         | 002064145*    | 380                |
| 100                   | 0,3                    | 4                  | 002062154* | -         | -         | -         | 002062155*    | 230                |
| 16                    | 0,5                    | 4                  | 002061540  | 002061890 | -         | -         | 002061640     | 300                |
| 25                    | 0,5                    | 4                  | 002061541  | 002061891 | -         | -         | 002061641     | 300                |
| 40                    | 0,5                    | 4                  | 002061542  | 002061892 | -         | -         | 002061642     | 300                |
| 63                    | 0,5                    | 4                  | 002061543  | 002061893 | -         | -         | 002061643     | 330                |
| 80                    | 0,5                    | 4                  | 002065545* | -         | -         | -         | 002065145*    | 380                |

\* Old version (EFI-4)

\*\* Reset version: in case of differential current, the button moves to the "trip" (middle) position. In case of manual turn off, the button moves to the "off" (lowest) position.

\*\*\* For use in in lower than standard system voltage (for instance 110V, 125V or 127V) system

\*\*\*\* Version with N-pole on the left side

## EFI-4 Short time delay &amp; Selective

| I <sub>n</sub><br>[A] | I <sub>Δn</sub><br>[A] | Number<br>of poles | Type A              |             | Weight<br>[g] | Packaging<br>[pcs] |
|-----------------------|------------------------|--------------------|---------------------|-------------|---------------|--------------------|
|                       |                        |                    | G/KV-Shorttimedelay | S-Selective |               |                    |
| 25                    | 0,03                   | 4                  | 002062747           | -           | 328           | 1/27               |
| 40                    | 0,03                   | 4                  | 002062748           | -           | 328           | 1/27               |
| 63                    | 0,03                   | 4                  | 002062749           | -           | 350           | 1/27               |
| 25                    | 0,1                    | 4                  | 002063747           | 002063752   | 320           | 1/27               |
| 40                    | 0,1                    | 4                  | 002063748           | 002063753   | 320           | 1/27               |
| 63                    | 0,1                    | 4                  | 002063749           | 002063754   | 338           | 1/27               |
| 100                   | 0,1                    | 4                  | -                   | 002062503   | 407           | 1/27               |
| 25                    | 0,3                    | 4                  | 002064747           | 002064752   | 320           | 1/27               |
| 40                    | 0,3                    | 4                  | 002064748           | 002064753   | 320           | 1/27               |
| 63                    | 0,3                    | 4                  | 002064749           | 002064754   | 338           | 1/27               |
| 100                   | 0,3                    | 4                  | -                   | 002062504   | 372           | 1/27               |



16 - 63 A



100 A



G/KV



S

# NEW EFI B and B+ type

## Features and advantages of UNIVERSAL CURRENT SENSITIVE RCCBs B type and B+ type

### APPLICATION

- Fault protection (protection against indirect contact of live parts)
- Additional protection (protection in case of direct contact of live parts,  $I_{\Delta n} \leq 30\text{mA}$ )
- Fire Protection (for locations exposed to fire hazard)

### Residual current sensitivity – UNIVERSAL

**AC** pure sinus residual current, 50/60Hz

**A** sinus and pulsating direct current, 50/60Hz

**B** **AC + A + smooth direct current + high frequency (1 kHz)**

**B+** **AC + A + smooth direct current + high frequency (20kHz)**

### Basic types

#### according to rated values:

4p B  $I_n = 25\text{A}, 40\text{A}, 63\text{A}, I_{\Delta n} = 30\text{mA}, 100\text{mA}, 300\text{mA}$

4p B+  $I_n = 25\text{A}, 40\text{A}, 63\text{A}, I_{\Delta n} = 30\text{mA}, 100\text{mA}, 300\text{mA}$

#### according to breaking times:

4p B, B+ instantaneous, short time delayed (G/KV), selective (S)

#### according to the number of poles:

4p, 2p

### Standards

IEC/EN 61008-1

basic standard for RCCB's AC and A type

IEC/EN 62423

additional requirements for type B

VDE 0664-400 B+

VDE standard for B+ requirements (20kHz)

### Mode of operation

Pure a.c. and pulsating d.c. type residual current sensitivity, A voltage independent

Smooth d.c. current sensitivity: B, B+ voltage dependent

Minimum operating voltage: 50V

### Typical applications

Which are vulnerable to smooth d.c. residual currents:

- Frequency converters,
- Photovoltaic systems, a.c side,
- Charging stations for electric vehicles,
- Variable speed machine tools,
- UPS, computer data centres
- Elevator controls,
- Cranes of all kinds
- Electronic equipment on construction sites,
- Test set-ups in laboratories,
- Installation in general where we can expect d.c. smooth direct residual currents, etc.

## Residual current circuit breakers

## B type residual current circuit breaker EFI-4 B Instantaneous

Rated residual current  
**0,03 - 0,3 A**Rated current  
**25 - 63 A**Type  
**B (Instantaneous)**

## EFI-4 B Instantaneous

| $I_n$<br>[A] | $I_{\Delta n}$<br>[A] | Number<br>of poles | Code No   | Weight<br>[g] | Packaging<br>[pcs] |
|--------------|-----------------------|--------------------|-----------|---------------|--------------------|
| 25           | 0,03                  | 4                  | 002062642 | 335           | 1/27               |
| 40           | 0,03                  | 4                  | 002062643 | 335           | 1/27               |
| 63           | 0,03                  | 4                  | 002062644 | 340           | 1/27               |
| 25           | 0,1                   | 4                  | 002063642 | 335           | 1/27               |
| 40           | 0,1                   | 4                  | 002063643 | 335           | 1/27               |
| 63           | 0,1                   | 4                  | 002063644 | 340           | 1/27               |
| 25           | 0,3                   | 4                  | 002064642 | 335           | 1/27               |
| 40           | 0,3                   | 4                  | 002064643 | 335           | 1/27               |
| 63           | 0,3                   | 4                  | 002064644 | 340           | 1/27               |



## B+ type residual current circuit breaker EFI-4 B+ Instantaneous

Rated residual current  
**0,03 - 0,3 A**Rated current  
**25 - 63 A**Type  
**B+ (Instantaneous)**

## EFI-4 B+ Instantaneous

| $I_n$<br>[A] | $I_{\Delta n}$<br>[A] | Number<br>of poles | Code No   | Weight<br>[g] | Packaging<br>[pcs] |
|--------------|-----------------------|--------------------|-----------|---------------|--------------------|
| 25           | 0,03                  | 4                  | 002062647 | 335           | 1/27               |
| 40           | 0,03                  | 4                  | 002062648 | 335           | 1/27               |
| 63           | 0,03                  | 4                  | 002062649 | 340           | 1/27               |
| 25           | 0,1                   | 4                  | 002063647 | 335           | 1/27               |
| 40           | 0,1                   | 4                  | 002063648 | 335           | 1/27               |
| 63           | 0,1                   | 4                  | 002063649 | 340           | 1/27               |
| 25           | 0,3                   | 4                  | 002064647 | 335           | 1/27               |
| 40           | 0,3                   | 4                  | 002064648 | 335           | 1/27               |
| 63           | 0,3                   | 4                  | 002064649 | 340           | 1/27               |



## B type residual current circuit breaker EFI-4 B G/KV-Short time delay

Rated residual current  
**0,03 - 0,3 A**Rated current  
**25 - 63 A**Type  
**B (G/KV-Short time delay)**

## EFI-4 B G/KV-Short time delay

| $I_n$<br>[A] | $I_{\Delta n}$<br>[A] | Number<br>of poles | Code No   | Weight<br>[g] | Packaging<br>[pcs] |
|--------------|-----------------------|--------------------|-----------|---------------|--------------------|
| 25           | 0,03                  | 4                  | 002062652 | 340           | 1/27               |
| 40           | 0,03                  | 4                  | 002062653 | 340           | 1/27               |
| 63           | 0,03                  | 4                  | 002062654 | 345           | 1/27               |
| 25           | 0,1                   | 4                  | 002063652 | 340           | 1/27               |
| 40           | 0,1                   | 4                  | 002063653 | 340           | 1/27               |
| 63           | 0,1                   | 4                  | 002063654 | 345           | 1/27               |
| 25           | 0,3                   | 4                  | 002064652 | 340           | 1/27               |
| 40           | 0,3                   | 4                  | 002064653 | 340           | 1/27               |
| 63           | 0,3                   | 4                  | 002064654 | 345           | 1/27               |



## B type residual current circuit breaker EFI-4 B S-Selective

Rated residual current  
**0,1 - 0,3 A**Rated current  
**25 - 63 A**Type  
**B (S-Selective)**

EFI-4 B S-Selective

| $I_n$<br>[A] | $I_{\Delta n}$<br>[A] | Number<br>of poles | Code No   | Weight<br>[g] | Packaging<br>[pcs] |
|--------------|-----------------------|--------------------|-----------|---------------|--------------------|
| 25           | 0,1                   | 4                  | 002063662 | 340           | 1/27               |
| 40           | 0,1                   | 4                  | 002063663 | 340           | 1/27               |
| 63           | 0,1                   | 4                  | 002063664 | 345           | 1/27               |
| 25           | 0,3                   | 4                  | 002064662 | 335           | 1/27               |
| 40           | 0,3                   | 4                  | 002064663 | 335           | 1/27               |
| 63           | 0,3                   | 4                  | 002064664 | 340           | 1/27               |

## Accessories for residual current circuit breakers EFI (16 - 80 A)

The PS EFI is fixed to EFI series switches. The width of the device is 9 mm, other dimensions are in compliance with EFI switches. The auxiliary switch PS EFI is used for the remote signalling of the state of contact's condition (closed/open) of EFI switches. During fitting, the EFI must be switched off. PS EFI and DA EFI can not be mounted both together, because both can only be mounted on the right side of EFI.



Auxiliary Switch PS EFI

| Type        | Contact             | Code No.  | Weight<br>[g] | Packaging<br>[pcs] |
|-------------|---------------------|-----------|---------------|--------------------|
| PS EFI - MD | b-contact/a-contact | 002069001 | 50            | 1/12               |
| PS EFI - 2M | 2 x b-contact       | 002069002 | 50            | 1/12               |
| PS EFI - 2D | 2 x a-contact       | 002069003 | 50            | 1/12               |

a - contact = make contact (NO)

b - contact = break contact (NC)

Sealing piece EFI-2

| Code No.  | Weight<br>[g] | Packaging<br>[pcs] |
|-----------|---------------|--------------------|
| 002069011 | 2             | 2                  |

Sealing piece EFI-4

| Code No.  | Weight<br>[g] | Packaging<br>[pcs] |
|-----------|---------------|--------------------|
| 002069012 | 3             | 2                  |

Shunt trip release DA EFI

| Type   | Code No.  | Weight<br>[g] | Packaging<br>[pcs] |
|--------|-----------|---------------|--------------------|
| DA EFI | 002069004 | 45            | 1/12               |

## Features and advantages of Residual Current Circuit Breakers for Protection of EV Charging Stations EFI eV

- Meets requirements from standard IEC 60364-7-722 --> Low-Voltage electrical Installations - Requirements for special installations or locations - Supplies for electric vehicles
- All necessary technical & installation information can be found on the front and side of the device
- Individual test measurements and other production data for each device can be read from the QR code, as well as instruction manuals and other technical materials
- detects smooth DC residual currents above 6 mA
- Basic installation requirements are engraved into housing
- Better protection of terminals against touching the parts under voltage
- Rated conditional short-circuit current: 10 kA
- RCCBs can be supplied with single phase and three phase busbars
- Clearly marked terminals to ensure appropriate connection
- Supply is possible both from top and bottom terminals
- Real contact position indication for easier identification, whether RCCB is in ON or OFF position

## Residual Current Circuit Breakers for Protection of EV Charging Stations EFI eV

|                                         |                                   |                  |
|-----------------------------------------|-----------------------------------|------------------|
| Rated residual current<br><b>0,03 A</b> | Rated current<br><b>25 - 63 A</b> | Type<br><b>A</b> |
|-----------------------------------------|-----------------------------------|------------------|

### EFI eV

| $I_n$<br>[A] | $I_{\Delta n}$<br>[A] | Number<br>of poles | Type A    | Weight<br>[g] | Packaging<br>[pcs] |
|--------------|-----------------------|--------------------|-----------|---------------|--------------------|
| 25           | 0,03                  | 4                  | 002062632 | 328           | 1/27               |
| 40           | 0,03                  | 4                  | 002062633 | 328           | 1/27               |
| 63           | 0,03                  | 4                  | 002062634 | 328           | 1/27               |