

## Modular devices

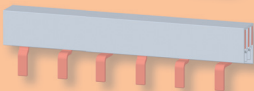




## SUMMARY OF MODELS AND DESCRIPTION

|                                                                              |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                                                              |  |  |  |  |  |
|                                                                              | page B5                                                                           | page B10                                                                          | page B13                                                                           | page B20                                                                            | page B23                                                                            |
| <b>Type</b>                                                                  | <b>LTP</b>                                                                        | <b>LTK</b>                                                                        | <b>LTS</b>                                                                         | <b>LTN</b>                                                                          | <b>LTN-UC</b>                                                                       |
| Rated short-circuit breaking capacity $I_{cn}$<br>(EN 60898-1) <sup>1)</sup> | 6 kA                                                                              | 6 kA                                                                              | 10 kA                                                                              | 10 kA                                                                               | 10 kA                                                                               |
| Rated current $I_n$                                                          | 2 ÷ 63 A                                                                          | 2 ÷ 40 A                                                                          | 0.5 ÷ 63 A                                                                         | 0.3 ÷ 80 A                                                                          | 1 ÷ 63 A                                                                            |
| Rated operating voltage $U_e$                                                | AC 230/400 V                                                                      | AC 230 V                                                                          | AC 230/400 V                                                                       | AC 230/400 V                                                                        | AC 230/400 V<br>DC 220 V (1-pole)<br>DC 440 V (2-pole)                              |
| Number of poles                                                              | 1, 2, 3                                                                           | 1N (1 module)                                                                     | 1, 1N, 2, 3, 3N                                                                    | 1, 1N, 2, 3, 3N                                                                     | 1, 2                                                                                |
| Characteristics                                                              | B, C                                                                              | B, C                                                                              | B, C, D                                                                            | B, C, D                                                                             | C                                                                                   |

<sup>1)</sup> The standard EN 60898-2 is valid for LTN-UC.

| Accessories             |                                                                                     |                    |            |            |            |            |
|-------------------------|-------------------------------------------------------------------------------------|--------------------|------------|------------|------------|------------|
| Auxiliary switches      |  | PS-LT              |            |            |            |            |
| Signal switches         |  | SS-LT              |            |            |            |            |
| Shunt trips             |  | -                  | SV-LT      |            |            |            |
| Undervoltage releases   |  | -                  | SP-LT      |            |            |            |
| Remote control          |  | RC-LT              |            |            |            |            |
| Interconnecting busbars |  | S1L, S2L, S3L, S4L |            |            |            |            |
| Locking inserts         |  | OD-LT-VU02         | OD-LT-VU01 | OD-LT-VU02 | OD-LT-VU01 | OD-LT-VU01 |
| Sealing insert          |  | OD-LT-VP01         | -          | OD-LT-VP01 |            |            |

## MINIATURE CIRCUIT BREAKERS LTN

### Description of LTN

#### Status indicator

- Indicates operating status of the device optically.

| Colour of indicator                                                               | State of device |
|-----------------------------------------------------------------------------------|-----------------|
|  | switched on     |
|  | switched off    |

#### Easy connection

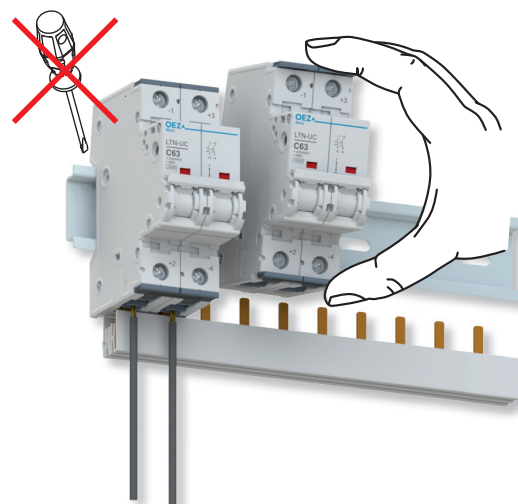
- **Double terminal** with a fixed barrier in the middle and a secured screw. Enables connection of conductor and interconnecting busbars from both sides of the device.
- **Safety:** the terminals are equipped with sliding plastic caps, which increase protection against dangerous contact.
- **Interconnection of circuit breakers** by interconnecting busbar both at the top and at the bottom.
- **Interconnection of circuit breakers with LFE/LFN and OLI/OLE residual current circuit breakers** by interconnecting busbar both at the top and at the bottom.



#### Mounting/demounting on/from "U" rails

The latches enable:

- very quick mounting and demounting by hand, without any tool needed
- withdrawal/replacement of the circuit breaker from a row of devices interconnected by the interconnecting busbar up or down without interruption of adjacent circuit or removal of the busbar.



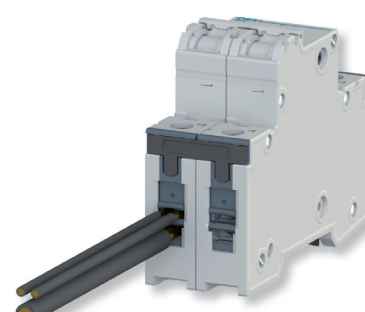
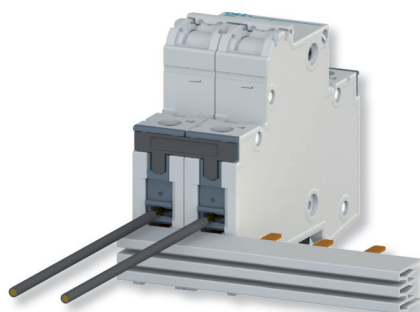
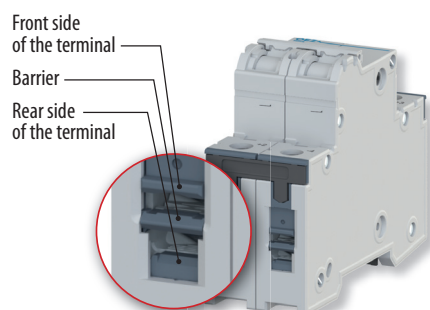
#### Sealing

- The circuit breaker can be sealed in on or off position.

- **Connection:** both front and rear part of the terminal makes it possible to connect both conductor and interconnecting busbar. This is possible on both sides of the device. For range of connection see page B13 (for LTN).

- **Easy connection and check of conductors** at simultaneous connection of interconnecting busbar- the interconnecting busbar does not cover the connecting area for conductors.

- **Connection possibility:**
  - of two conductors of the different cross-sections
  - up to 4 conductors in the terminal
  - conductor of cross-section up to 35 mm<sup>2</sup>.



## MINIATURE CIRCUIT BREAKERS LTN



LTN-10B-1



LTN-16B-1N

- Series of miniature circuit breakers up to 80 A, AC 230/400 V and DC 72 V / pole.
- The series of circuit breakers for protection of direct current (DC) and alternating current (AC) circuits up to 63 A, DC 220 V (1-pole), DC 440 V (2-pole), AC 230/400 V. In connection in DC circuit it is mandatory to observe device polarity.
- For protection of cables and conductors against overload and short-circuit.
- Tripping characteristics B, C, D according to EN 60898-1 (LTN) and tripping characteristic C (LTN-UC) according to EN 60898-2.
- Breaking capacity 10 kA.

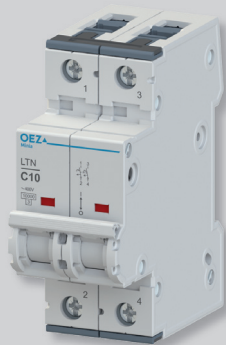
### Miniature circuit breakers 1-pole

| I <sub>n</sub><br>[A] | Characteristic B |            | Characteristic C |            | Characteristic D |            | Number<br>of modules | Weight<br>[kg] | Package<br>[pcs] |
|-----------------------|------------------|------------|------------------|------------|------------------|------------|----------------------|----------------|------------------|
|                       | Type             | Order code | Type             | Order code | Type             | Order code |                      |                |                  |
| 0.3                   | -                | -          | LTN-0.3C-1       | OEZ:41647  | LTN-0.3D-1       | OEZ:41664  | 1                    | 0.186          | 12               |
| 0.5                   | -                | -          | LTN-0.5C-1       | OEZ:41648  | LTN-0.5D-1       | OEZ:41665  | 1                    | 0.184          | 12               |
| 1                     | -                | -          | LTN-1C-1         | OEZ:41649  | LTN-1D-1         | OEZ:41666  | 1                    | 0.184          | 12               |
| 1.6                   | -                | -          | LTN-1.6C-1       | OEZ:41650  | LTN-1.6D-1       | OEZ:41667  | 1                    | 0.182          | 12               |
| 2                     | LTN-2B-1         | OEZ:41634  | LTN-2C-1         | OEZ:41651  | LTN-2D-1         | OEZ:41668  | 1                    | 0.183          | 12               |
| 4                     | LTN-4B-1         | OEZ:41635  | LTN-4C-1         | OEZ:41652  | LTN-4D-1         | OEZ:41669  | 1                    | 0.162          | 12               |
| 6                     | LTN-6B-1         | OEZ:41636  | LTN-6C-1         | OEZ:41653  | LTN-6D-1         | OEZ:41670  | 1                    | 0.174          | 12               |
| 8                     | -                | -          | LTN-8C-1         | OEZ:41654  | LTN-8D-1         | OEZ:41671  | 1                    | 0.172          | 12               |
| 10                    | LTN-10B-1        | OEZ:41638  | LTN-10C-1        | OEZ:41655  | LTN-10D-1        | OEZ:41672  | 1                    | 0.176          | 12               |
| 13                    | LTN-13B-1        | OEZ:41639  | LTN-13C-1        | OEZ:41656  | LTN-13D-1        | OEZ:41673  | 1                    | 0.179          | 12               |
| 16                    | LTN-16B-1        | OEZ:41640  | LTN-16C-1        | OEZ:41657  | LTN-16D-1        | OEZ:41674  | 1                    | 0.178          | 12               |
| 20                    | LTN-20B-1        | OEZ:41641  | LTN-20C-1        | OEZ:41658  | LTN-20D-1        | OEZ:41675  | 1                    | 0.178          | 12               |
| 25                    | LTN-25B-1        | OEZ:41642  | LTN-25C-1        | OEZ:41659  | LTN-25D-1        | OEZ:41676  | 1                    | 0.176          | 12               |
| 32                    | LTN-32B-1        | OEZ:41643  | LTN-32C-1        | OEZ:41660  | LTN-32D-1        | OEZ:41677  | 1                    | 0.180          | 12               |
| 40                    | LTN-40B-1        | OEZ:41644  | LTN-40C-1        | OEZ:41661  | LTN-40D-1        | OEZ:41678  | 1                    | 0.187          | 12               |
| 50                    | LTN-50B-1        | OEZ:41645  | LTN-50C-1        | OEZ:41662  | LTN-50D-1        | OEZ:41679  | 1                    | 0.181          | 12               |
| 63                    | LTN-63B-1        | OEZ:41646  | LTN-63C-1        | OEZ:41663  | LTN-63D-1        | OEZ:41680  | 1                    | 0.188          | 12               |
| 80                    | LTN-80B-1        | OEZ:43218  | LTN-80C-1        | OEZ:43221  | -                | -          | 1                    | 0.190          | 12               |

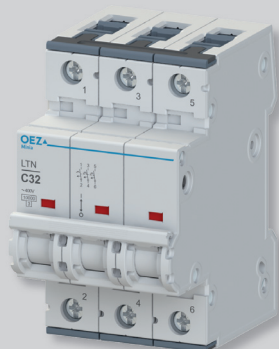
### Miniature circuit breakers 1+N-pole

| I <sub>n</sub><br>[A] | Characteristic B |            | Characteristic C |            | Characteristic D |            | Number<br>of modules | Weight<br>[kg] | Package<br>[pcs] |
|-----------------------|------------------|------------|------------------|------------|------------------|------------|----------------------|----------------|------------------|
|                       | Type             | Order code | Type             | Order code | Type             | Order code |                      |                |                  |
| 2                     | -                | -          | LTN-2C-1N        | OEZ:41692  | LTN-2D-1N        | OEZ:43228  | 2                    | 0.340          | 6                |
| 4                     | -                | -          | LTN-4C-1N        | OEZ:41693  | LTN-4D-1N        | OEZ:43232  | 2                    | 0.338          | 6                |
| 6                     | LTN-6B-1N        | OEZ:41681  | LTN-6C-1N        | OEZ:41694  | LTN-6D-1N        | OEZ:41705  | 2                    | 0.350          | 6                |
| 8                     | -                | -          | LTN-8C-1N        | OEZ:41695  | LTN-8D-1N        | OEZ:41706  | 2                    | 0.326          | 6                |
| 10                    | LTN-10B-1N       | OEZ:41683  | LTN-10C-1N       | OEZ:41696  | LTN-10D-1N       | OEZ:41707  | 2                    | 0.329          | 6                |
| 13                    | LTN-13B-1N       | OEZ:41684  | LTN-13C-1N       | OEZ:41697  | LTN-13D-1N       | OEZ:41708  | 2                    | 0.332          | 6                |
| 16                    | LTN-16B-1N       | OEZ:41685  | LTN-16C-1N       | OEZ:41698  | LTN-16D-1N       | OEZ:41709  | 2                    | 0.328          | 6                |
| 20                    | LTN-20B-1N       | OEZ:41686  | LTN-20C-1N       | OEZ:41699  | LTN-20D-1N       | OEZ:41710  | 2                    | 0.334          | 6                |
| 25                    | LTN-25B-1N       | OEZ:41687  | LTN-25C-1N       | OEZ:41700  | LTN-25D-1N       | OEZ:41711  | 2                    | 0.337          | 6                |
| 32                    | LTN-32B-1N       | OEZ:41688  | LTN-32C-1N       | OEZ:41701  | LTN-32D-1N       | OEZ:41712  | 2                    | 0.340          | 6                |
| 40                    | LTN-40B-1N       | OEZ:41689  | LTN-40C-1N       | OEZ:41702  | LTN-40D-1N       | OEZ:41713  | 2                    | 0.343          | 6                |
| 50                    | LTN-50B-1N       | OEZ:41690  | LTN-50C-1N       | OEZ:41703  | LTN-50D-1N       | OEZ:41714  | 2                    | 0.348          | 6                |
| 63                    | LTN-63B-1N       | OEZ:41691  | LTN-63C-1N       | OEZ:41704  | LTN-63D-1N       | OEZ:41715  | 2                    | 0.356          | 6                |
| 80                    | -                | -          | LTN-80C-1N       | OEZ:43222  | -                | -          | 2                    | 0.358          | 6                |

## MINIATURE CIRCUIT BREAKERS LTN



LTN-10C-2



LTN-32C-3



LTN-20D-3N

## Miniature circuit breakers 2-pole

| I <sub>n</sub><br>[A] | Characteristic B |            | Characteristic C  |            | Characteristic D  |            | Number<br>of modules | Weight<br>[kg] | Package<br>[pcs] |
|-----------------------|------------------|------------|-------------------|------------|-------------------|------------|----------------------|----------------|------------------|
|                       | Type             | Order code | Type              | Order code | Type              | Order code |                      |                |                  |
| 0.3                   | -                | -          | <b>LTN-0.3C-2</b> | OEZ:41730  | <b>LTN-0.3D-2</b> | OEZ:41747  | 2                    | 0.342          | 6                |
| 0.5                   | -                | -          | <b>LTN-0.5C-2</b> | OEZ:41731  | <b>LTN-0.5D-2</b> | OEZ:41748  | 2                    | 0.343          | 6                |
| 1                     | -                | -          | <b>LTN-1C-2</b>   | OEZ:41732  | <b>LTN-1D-2</b>   | OEZ:41749  | 2                    | 0.356          | 6                |
| 1.6                   | -                | -          | <b>LTN-1.6C-2</b> | OEZ:41733  | <b>LTN-1.6D-2</b> | OEZ:41750  | 2                    | 0.341          | 6                |
| 2                     | -                | -          | <b>LTN-2C-2</b>   | OEZ:41734  | <b>LTN-2D-2</b>   | OEZ:41751  | 2                    | 0.341          | 6                |
| 4                     | -                | -          | <b>LTN-4C-2</b>   | OEZ:41735  | <b>LTN-4D-2</b>   | OEZ:41752  | 2                    | 0.329          | 6                |
| 6                     | <b>LTN-6B-2</b>  | OEZ:41719  | <b>LTN-6C-2</b>   | OEZ:41736  | <b>LTN-6D-2</b>   | OEZ:41753  | 2                    | 0.327          | 6                |
| 8                     | -                | -          | <b>LTN-8C-2</b>   | OEZ:41737  | <b>LTN-8D-2</b>   | OEZ:41754  | 2                    | 0.325          | 6                |
| 10                    | <b>LTN-10B-2</b> | OEZ:41721  | <b>LTN-10C-2</b>  | OEZ:41738  | <b>LTN-10D-2</b>  | OEZ:41755  | 2                    | 0.340          | 6                |
| 13                    | <b>LTN-13B-2</b> | OEZ:41722  | <b>LTN-13C-2</b>  | OEZ:41739  | <b>LTN-13D-2</b>  | OEZ:41756  | 2                    | 0.343          | 6                |
| 16                    | <b>LTN-16B-2</b> | OEZ:41723  | <b>LTN-16C-2</b>  | OEZ:41740  | <b>LTN-16D-2</b>  | OEZ:41757  | 2                    | 0.343          | 6                |
| 20                    | <b>LTN-20B-2</b> | OEZ:41724  | <b>LTN-20C-2</b>  | OEZ:41741  | <b>LTN-20D-2</b>  | OEZ:41758  | 2                    | 0.338          | 6                |
| 25                    | <b>LTN-25B-2</b> | OEZ:41725  | <b>LTN-25C-2</b>  | OEZ:41742  | <b>LTN-25D-2</b>  | OEZ:41759  | 2                    | 0.340          | 6                |
| 32                    | <b>LTN-32B-2</b> | OEZ:41726  | <b>LTN-32C-2</b>  | OEZ:41743  | <b>LTN-32D-2</b>  | OEZ:41760  | 2                    | 0.359          | 6                |
| 40                    | <b>LTN-40B-2</b> | OEZ:41727  | <b>LTN-40C-2</b>  | OEZ:41744  | <b>LTN-40D-2</b>  | OEZ:41761  | 2                    | 0.344          | 6                |
| 50                    | <b>LTN-50B-2</b> | OEZ:41728  | <b>LTN-50C-2</b>  | OEZ:41745  | <b>LTN-50D-2</b>  | OEZ:43085  | 2                    | 0.346          | 6                |
| 63                    | <b>LTN-63B-2</b> | OEZ:41729  | <b>LTN-63C-2</b>  | OEZ:41746  | <b>LTN-63D-2</b>  | OEZ:43087  | 2                    | 0.358          | 6                |
| 80                    | <b>LTN-80B-2</b> | OEZ:43219  | <b>LTN-80C-2</b>  | OEZ:43223  | -                 | -          | 2                    | 0.361          | 6                |

## Miniature circuit breakers 3-pole

| I <sub>n</sub><br>[A] | Characteristic B |            | Characteristic C  |            | Characteristic D  |            | Number<br>of modules | Weight<br>[kg] | Package<br>[pcs] |
|-----------------------|------------------|------------|-------------------|------------|-------------------|------------|----------------------|----------------|------------------|
|                       | Type             | Order code | Type              | Order code | Type              | Order code |                      |                |                  |
| 0.3                   | -                | -          | <b>LTN-0.3C-3</b> | OEZ:41779  | <b>LTN-0.3D-3</b> | OEZ:41796  | 3                    | 0.502          | 4                |
| 0.5                   | -                | -          | <b>LTN-0.5C-3</b> | OEZ:41780  | <b>LTN-0.5D-3</b> | OEZ:41797  | 3                    | 0.504          | 4                |
| 1                     | -                | -          | <b>LTN-1C-3</b>   | OEZ:41781  | <b>LTN-1D-3</b>   | OEZ:41798  | 3                    | 0.502          | 4                |
| 1.6                   | -                | -          | <b>LTN-1.6C-3</b> | OEZ:41782  | <b>LTN-1.6D-3</b> | OEZ:41799  | 3                    | 0.494          | 4                |
| 2                     | -                | -          | <b>LTN-2C-3</b>   | OEZ:41783  | <b>LTN-2D-3</b>   | OEZ:41800  | 3                    | 0.486          | 4                |
| 4                     | -                | -          | <b>LTN-4C-3</b>   | OEZ:41784  | <b>LTN-4D-3</b>   | OEZ:41801  | 3                    | 0.482          | 4                |
| 6                     | <b>LTN-6B-3</b>  | OEZ:41768  | <b>LTN-6C-3</b>   | OEZ:41785  | <b>LTN-6D-3</b>   | OEZ:41802  | 3                    | 0.487          | 4                |
| 8                     | -                | -          | <b>LTN-8C-3</b>   | OEZ:41786  | <b>LTN-8D-3</b>   | OEZ:41803  | 3                    | 0.477          | 4                |
| 10                    | <b>LTN-10B-3</b> | OEZ:41770  | <b>LTN-10C-3</b>  | OEZ:41787  | <b>LTN-10D-3</b>  | OEZ:41804  | 3                    | 0.474          | 4                |
| 13                    | <b>LTN-13B-3</b> | OEZ:41771  | <b>LTN-13C-3</b>  | OEZ:41788  | <b>LTN-13D-3</b>  | OEZ:41805  | 3                    | 0.491          | 4                |
| 16                    | <b>LTN-16B-3</b> | OEZ:41772  | <b>LTN-16C-3</b>  | OEZ:41789  | <b>LTN-16D-3</b>  | OEZ:41806  | 3                    | 0.469          | 4                |
| 20                    | <b>LTN-20B-3</b> | OEZ:41773  | <b>LTN-20C-3</b>  | OEZ:41790  | <b>LTN-20D-3</b>  | OEZ:41807  | 3                    | 0.489          | 4                |
| 25                    | <b>LTN-25B-3</b> | OEZ:41774  | <b>LTN-25C-3</b>  | OEZ:41791  | <b>LTN-25D-3</b>  | OEZ:41808  | 3                    | 0.489          | 4                |
| 32                    | <b>LTN-32B-3</b> | OEZ:41775  | <b>LTN-32C-3</b>  | OEZ:41792  | <b>LTN-32D-3</b>  | OEZ:41809  | 3                    | 0.484          | 4                |
| 40                    | <b>LTN-40B-3</b> | OEZ:41776  | <b>LTN-40C-3</b>  | OEZ:41793  | <b>LTN-40D-3</b>  | OEZ:41810  | 3                    | 0.502          | 4                |
| 50                    | <b>LTN-50B-3</b> | OEZ:41777  | <b>LTN-50C-3</b>  | OEZ:41794  | <b>LTN-50D-3</b>  | OEZ:41811  | 3                    | 0.513          | 4                |
| 63                    | <b>LTN-63B-3</b> | OEZ:41778  | <b>LTN-63C-3</b>  | OEZ:41795  | <b>LTN-63D-3</b>  | OEZ:41812  | 3                    | 0.526          | 4                |
| 80                    | <b>LTN-80B-3</b> | OEZ:43220  | <b>LTN-80C-3</b>  | OEZ:43224  | -                 | -          | 3                    | 0.528          | 4                |

## Miniature circuit breakers 3+N-pole

| I <sub>n</sub><br>[A] | Characteristic B  |            | Characteristic C  |            | Characteristic D  |            | Number<br>of modules | Weight<br>[kg] | Package<br>[pcs] |
|-----------------------|-------------------|------------|-------------------|------------|-------------------|------------|----------------------|----------------|------------------|
|                       | Type              | Order code | Type              | Order code | Type              | Order code |                      |                |                  |
| 2                     | -                 | -          | <b>LTN-2C-3N</b>  | OEZ:43227  | <b>LTN-2D-3N</b>  | OEZ:43229  | 4                    | 0.668          | 3                |
| 4                     | -                 | -          | <b>LTN-4C-3N</b>  | OEZ:43231  | <b>LTN-4D-3N</b>  | OEZ:43233  | 4                    | 0.643          | 3                |
| 6                     | <b>LTN-6B-3N</b>  | OEZ:41815  | <b>LTN-6C-3N</b>  | OEZ:41826  | <b>LTN-6D-3N</b>  | OEZ:41837  | 4                    | 0.640          | 3                |
| 8                     | -                 | -          | <b>LTN-8C-3N</b>  | OEZ:41827  | <b>LTN-8D-3N</b>  | OEZ:41838  | 4                    | 0.649          | 3                |
| 10                    | <b>LTN-10B-3N</b> | OEZ:41817  | <b>LTN-10C-3N</b> | OEZ:41828  | <b>LTN-10D-3N</b> | OEZ:41839  | 4                    | 0.635          | 3                |
| 13                    | <b>LTN-13B-3N</b> | OEZ:41818  | <b>LTN-13C-3N</b> | OEZ:41829  | <b>LTN-13D-3N</b> | OEZ:41840  | 4                    | 0.646          | 3                |
| 16                    | <b>LTN-16B-3N</b> | OEZ:41819  | <b>LTN-16C-3N</b> | OEZ:41830  | <b>LTN-16D-3N</b> | OEZ:41841  | 4                    | 0.637          | 3                |
| 20                    | <b>LTN-20B-3N</b> | OEZ:41820  | <b>LTN-20C-3N</b> | OEZ:41831  | <b>LTN-20D-3N</b> | OEZ:41842  | 4                    | 0.645          | 3                |
| 25                    | <b>LTN-25B-3N</b> | OEZ:41821  | <b>LTN-25C-3N</b> | OEZ:41832  | <b>LTN-25D-3N</b> | OEZ:41843  | 4                    | 0.652          | 3                |
| 32                    | <b>LTN-32B-3N</b> | OEZ:41822  | <b>LTN-32C-3N</b> | OEZ:41833  | <b>LTN-32D-3N</b> | OEZ:41844  | 4                    | 0.665          | 3                |
| 40                    | <b>LTN-40B-3N</b> | OEZ:41823  | <b>LTN-40C-3N</b> | OEZ:41834  | <b>LTN-40D-3N</b> | OEZ:41845  | 4                    | 0.668          | 3                |
| 50                    | <b>LTN-50B-3N</b> | OEZ:41824  | <b>LTN-50C-3N</b> | OEZ:41835  | <b>LTN-50D-3N</b> | OEZ:43086  | 4                    | 0.690          | 3                |
| 63                    | <b>LTN-63B-3N</b> | OEZ:41825  | <b>LTN-63C-3N</b> | OEZ:41836  | <b>LTN-63D-3N</b> | OEZ:43088  | 4                    | 0.696          | 3                |
| 80                    | -                 | -          | <b>LTN-80C-3N</b> | OEZ:43225  | -                 | -          | 4                    | 0.663          | 3                |

## MINIATURE CIRCUIT BREAKERS LTN

### Specifications

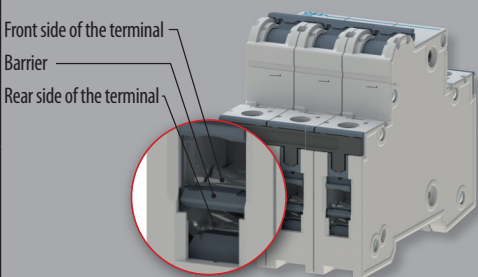
| Type                                                        | LTN                                                                               | LTN-UC                                                                              |
|-------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Standards                                                   | EN 60898-1                                                                        | EN 60898-2                                                                          |
| Approval marks                                              |  |  |
| Number of poles                                             | 1, 1 + N, 2, 3, 3 + N                                                             | 1, 2                                                                                |
| Tripping characteristics                                    | B, C, D                                                                           | C                                                                                   |
| Rated current                                               | $I_n$ 0.3 ÷ 80 A                                                                  | 1 ÷ 63 A                                                                            |
| Rated operating voltage                                     | $U_e$ AC 230/400 V                                                                | AC 230/400 V<br>DC 220 V (1-pole), DC 440 V (2-pole)                                |
| Max. operating voltage                                      | $U_{max}$ AC 250/440 V, DC 72 V <sup>1)</sup> / protected pole                    | AC 250/440 V, DC 250 V / protected pole                                             |
| Min. operating voltage (1 pole)                             | $U_{min}$ AC/DC 24 V                                                              | AC/DC 24 V                                                                          |
| Rated insulation voltage                                    | $U_i$ AC 250/440 V                                                                | AC 250/440 V, DC 250 V / protected pole                                             |
| Rated frequency                                             | $f_n$ 50/60 Hz                                                                    | 50/60 Hz                                                                            |
| Rated short-circuit breaking capacity (EN 60898-1)          | $I_{cn}$ AC 10 kA                                                                 | AC 10 kA                                                                            |
| Rated short-circuit breaking capacity (EN 60898-2)          | $I_{cn}$ DC 10 kA                                                                 | DC 10 kA                                                                            |
| Rated short-circuit ultimate breaking capacity (EN 60947-2) | $I_{cu}$ AC 35 kA for 0.3 ÷ 6 A                                                   | -                                                                                   |
|                                                             | AC 20 kA for 8 ÷ 32 A                                                             | -                                                                                   |
|                                                             | AC 15 kA for 40 ÷ 63 A                                                            | -                                                                                   |
|                                                             | AC 10 kA 80 A                                                                     | -                                                                                   |
|                                                             | DC 15 kA                                                                          | DC 15 kA                                                                            |
| Electrical endurance                                        | 10 000 operating cycles                                                           | 10 000 operating cycles, for 40, 50, 63 A 5 000 operating cycles                    |
| Mechanical endurance                                        | 10 000 operating cycles                                                           | 10 000 operating cycles, for 40, 50, 63 A 5 000 operating cycles                    |
| Energy limitation class                                     | 3                                                                                 | 3                                                                                   |
| Mounting on "U" rail according to EN 60715 - type           | TH 35                                                                             | TH 35                                                                               |
| Degree of protection - with connected conductors            | IP20                                                                              | IP20                                                                                |
| <b>Connection</b>                                           |                                                                                   |                                                                                     |
| Cu conductor                                                | see table Connection range                                                        | see table Connection range                                                          |
| Screw head type                                             | PZ2                                                                               | PZ2                                                                                 |
| Torque                                                      | max. 3.5 Nm                                                                       | max. 3.5 Nm                                                                         |
| Top or bottom connection                                    | top/bottom                                                                        | top/bottom <sup>2)</sup>                                                            |
| <b>Operating conditions</b>                                 |                                                                                   |                                                                                     |
| Ambient temperature                                         | -25 ÷ +55 °C, max. 95% air humidity                                               | -25 ÷ +55 °C, max. 95% air humidity                                                 |
| Working position                                            | arbitrary                                                                         | arbitrary                                                                           |
| Climatic resistance (EN 60068-2-30)                         | 6 operating cycles                                                                | 6 operating cycles                                                                  |
| Shocks (EN 60068-2-27)                                      | 150 m/s <sup>2</sup> in 11 ms half-sine pulse                                     | 150 m/s <sup>2</sup> in 11 ms half-sine pulse                                       |
| Resistance to sinusoidal vibration (EN 60068-2-6)           | 50 m/s <sup>2</sup> at 25 ÷ 150 Hz and 60 at 35 Hz (4 s)                          | 50 m/s <sup>2</sup> at 25 ÷ 150 Hz and 60 at 35 Hz (4 s)                            |
| Seismic resistance                                          | IEC 980: 1993 <sup>3)</sup>                                                       | IEC 980: 1993 <sup>3)</sup>                                                         |

<sup>1)</sup> For  $I_n = 0.3$  A and 0.5 A valid for DC 24 V.

<sup>2)</sup> It is necessary to keep the connection polarity marked on the device in the DC circuits.

<sup>3)</sup> It passed the seismic tests for NPP Dukovany and Temelin.

### Connection range

|  |                                       |                           | Type and conductor cross-section for <b>rear side</b> of the terminal |                           |                                       |                    |                                             |                       |                    |                    |                         |                   |                          |                    |                    |                            |                   |  |
|------------------------------------------------------------------------------------|---------------------------------------|---------------------------|-----------------------------------------------------------------------|---------------------------|---------------------------------------|--------------------|---------------------------------------------|-----------------------|--------------------|--------------------|-------------------------|-------------------|--------------------------|--------------------|--------------------|----------------------------|-------------------|--|
|                                                                                    |                                       |                           | Interconnecting busbar                                                | 0.75 ÷ 10 mm <sup>2</sup> | 1x conductor rigid 16 mm <sup>2</sup> | 25 mm <sup>2</sup> | 2x conductor rigid 0.75 ÷ 6 mm <sup>2</sup> | 1 ÷ 6 mm <sup>2</sup> | 10 mm <sup>2</sup> | 16 mm <sup>2</sup> | 1 ÷ 2.5 mm <sup>2</sup> | 4 mm <sup>2</sup> | 0.75 ÷ 6 mm <sup>2</sup> | 10 mm <sup>2</sup> | 16 mm <sup>2</sup> | 0.75 ÷ 2.5 mm <sup>2</sup> | 4 mm <sup>2</sup> |  |
| Type and conductor cross-section for <b>front side</b> of the terminal             | 1x conductor rigid                    | 0.75 ÷ 16 mm <sup>2</sup> | ✓                                                                     | ✓                         | ✓                                     | ✓                  | ✓                                           | ✓                     | ✓                  | ✓                  | ✓                       | ✓                 | ✓                        | ✓                  | ✓                  | ✓                          |                   |  |
|                                                                                    |                                       | 25 mm <sup>2</sup>        | ✓                                                                     | ✓                         | ✓                                     | ✗                  | ✓                                           | ✓                     | ✓                  | ✓                  | ✓                       | ✓                 | ✓                        | ✓                  | ✓                  | ✓                          |                   |  |
|                                                                                    |                                       | 35 mm <sup>2</sup>        | ✓                                                                     | ✓                         | ✗                                     | ✗                  | ✓                                           | ✓                     | ✓                  | ✗                  | ✓                       | ✓                 | ✓                        | ✗                  | ✗                  | ✓                          |                   |  |
|                                                                                    | 2x conductor rigid                    | 0.75 ÷ 10 mm <sup>2</sup> | ✓                                                                     | ✓                         | ✓                                     | ✓                  | ✓                                           | ✓                     | ✓                  | ✓                  | ✓                       | ✓                 | ✓                        | ✓                  | ✓                  | ✓                          |                   |  |
|                                                                                    |                                       | 1 ÷ 16 mm <sup>2</sup>    | ✓                                                                     | ✓                         | ✓                                     | ✓                  | ✓                                           | ✓                     | ✓                  | ✓                  | ✓                       | ✓                 | ✓                        | ✓                  | ✓                  | ✓                          |                   |  |
|                                                                                    | 1x conductor flexible <sup>1)</sup>   | 25 mm <sup>2</sup>        | ✓                                                                     | ✓                         | ✓                                     | ✗                  | ✓                                           | ✓                     | ✓                  | ✓                  | ✓                       | ✓                 | ✓                        | ✗                  | ✓                  | ✓                          |                   |  |
|                                                                                    |                                       | 1 ÷ 6 mm <sup>2</sup>     | ✓                                                                     | ✓                         | ✓                                     | ✓                  | ✓                                           | ✓                     | ✓                  | ✓                  | ✓                       | ✓                 | ✓                        | ✓                  | ✓                  | ✓                          |                   |  |
|                                                                                    | 2x conductor flexible <sup>1)</sup>   | 1 ÷ 6 mm <sup>2</sup>     | ✓                                                                     | ✓                         | ✓                                     | ✓                  | ✓                                           | ✓                     | ✓                  | ✓                  | ✓                       | ✓                 | ✓                        | ✓                  | ✓                  | ✓                          |                   |  |
|                                                                                    |                                       | 0.75 ÷ 16 mm <sup>2</sup> | ✓                                                                     | ✓                         | ✓                                     | ✗                  | ✓                                           | ✓                     | ✓                  | ✓                  | ✓                       | ✓                 | ✓                        | ✓                  | ✓                  | ✓                          |                   |  |
|                                                                                    | 1x conductor flexible with end sleeve | 25 mm <sup>2</sup>        | ✓                                                                     | ✓                         | ✓                                     | ✗                  | ✓                                           | ✓                     | ✓                  | ✓                  | ✓                       | ✓                 | ✓                        | ✗                  | ✓                  | ✓                          |                   |  |
|                                                                                    |                                       | 0.75 ÷ 6 mm <sup>2</sup>  | ✓                                                                     | ✓                         | ✓                                     | ✓                  | ✓                                           | ✓                     | ✓                  | ✓                  | ✓                       | ✓                 | ✓                        | ✓                  | ✓                  | ✓                          |                   |  |
|                                                                                    | 2x conductor flexible with end sleeve | 0.75 ÷ 6 mm <sup>2</sup>  | ✓                                                                     | ✓                         | ✓                                     | ✓                  | ✓                                           | ✓                     | ✓                  | ✓                  | ✓                       | ✓                 | ✓                        | ✓                  | ✓                  | ✓                          |                   |  |

<sup>1)</sup> The conductor must be twisted before insertion to a terminal; individual conductor fibres must not stick out of the terminal.

Conductors of the same type and cross-section must be used for connection of two conductors to the same level of a terminal.

✓ the stated connection combination is possible

✗ the stated connection combination is not possible

## MINIATURE CIRCUIT BREAKERS LTN

Internal impedance  $Z$ , powers losses  $P$  for miniature circuit breakers LTN and LTN-UC

| $I_n$<br>[A] | Characteristic B       |                       | Characteristic C       |                       | Characteristic D       |                       |
|--------------|------------------------|-----------------------|------------------------|-----------------------|------------------------|-----------------------|
|              | $Z^{(1)}$<br>[mΩ/pole] | $P^{(1)}$<br>[W/pole] | $Z^{(1)}$<br>[mΩ/pole] | $P^{(1)}$<br>[W/pole] | $Z^{(1)}$<br>[mΩ/pole] | $P^{(1)}$<br>[W/pole] |
| 0.3          | -                      | -                     | 10270                  | 0.9                   | 10070                  | 1.0                   |
| 0.5          | -                      | -                     | 3300                   | 0.8                   | 3100                   | 0.8                   |
| 1            | -                      | -                     | 1200                   | 1.2                   | 1075                   | 1.1                   |
| 1.6          | -                      | -                     | 450                    | 1.2                   | 408                    | 1.0                   |
| 2            | 381                    | 1.5                   | 298                    | 1.2                   | 295                    | 1.2                   |
| 4            | 93                     | 1.5                   | 81                     | 1.3                   | 74                     | 1.2                   |
| 6            | 58                     | 2.1                   | 45                     | 1.6                   | 44                     | 1.6                   |
| 8            | -                      | -                     | 14                     | 0.9                   | 12                     | 0.8                   |
| 10           | 13                     | 1.3                   | 11                     | 1.0                   | 8.5                    | 0.9                   |
| 13           | 9.9                    | 1.7                   | 8.3                    | 1.4                   | 8.3                    | 1.4                   |
| 16           | 6.9                    | 1.8                   | 6.3                    | 1.6                   | 6.2                    | 1.6                   |
| 20           | 5.5                    | 2.2                   | 4.3                    | 1.7                   | 4.0                    | 1.6                   |
| 25           | 3.8                    | 2.4                   | 3.5                    | 2.2                   | 3.3                    | 2.1                   |
| 32           | 2.5                    | 2.6                   | 2.6                    | 2.6                   | 2.1                    | 2.1                   |
| 40           | 2.2                    | 3.6                   | 2.2                    | 3.5                   | 1.9                    | 3.0                   |
| 50           | 1.7                    | 4.3                   | 1.5                    | 3.8                   | 1.5                    | 3.7                   |
| 63           | 1.5                    | 6.0                   | 1.2                    | 4.9                   | 1.3                    | 5.0                   |
| 80           | 1.1                    | 6.7                   | 1.1                    | 6.7                   | -                      | -                     |

<sup>1)</sup> Average values

Internal impedance  $Z_s$  for miniature circuit breakers LTN and LTN-UC

| $I_n$<br>[A] | Max. impedance of fault loop $TN Z_s$ [Ω] <sup>1)</sup> |              |                  |              |                  |              |                              |                              |                                |
|--------------|---------------------------------------------------------|--------------|------------------|--------------|------------------|--------------|------------------------------|------------------------------|--------------------------------|
|              | AC network ( $U_0$ AC 230 V) <sup>2)</sup>              |              |                  |              |                  |              | DC network <sup>3)</sup>     |                              |                                |
|              | Characteristic B                                        |              | Characteristic C |              | Characteristic D |              | Characteristic C             |                              |                                |
|              | $t \leq 0.4$ s                                          | $t \leq 5$ s | $t \leq 0.4$ s   | $t \leq 5$ s | $t \leq 0.4$ s   | $t \leq 5$ s | $t \leq 1$ s, $U_0$ DC 220 V | $t \leq 5$ s, $U_0$ DC 440 V | $t \leq 0.1$ s, $U_0$ DC 440 V |
| 0.3          | -                                                       | -            | 76.67            | 123.26       | 38.33            | 123.26       | -                            | -                            | -                              |
| 0.5          | -                                                       | -            | 46.00            | 73.95        | 23.00            | 73.95        | -                            | -                            | -                              |
| 1            | -                                                       | -            | 23.00            | 36.98        | 11.50            | 36.98        | 14.67                        | 35.37                        | 29.33                          |
| 1.6          | -                                                       | -            | 14.38            | 23.11        | 7.19             | 23.11        | -                            | -                            | -                              |
| 2            | 23.00                                                   | 23.00        | 11.50            | 18.49        | 5.75             | 18.49        | 7.34                         | 17.68                        | 14.67                          |
| 4            | 11.50                                                   | 11.50        | 5.75             | 9.24         | 2.88             | 9.24         | 3.67                         | 8.84                         | 7.33                           |
| 6            | 7.67                                                    | 7.67         | 3.83             | 6.16         | 1.92             | 6.16         | 2.45                         | 5.89                         | 4.89                           |
| 8            | -                                                       | -            | 2.88             | 4.62         | 1.44             | 4.62         | 1.84                         | 4.42                         | 3.67                           |
| 10           | 4.60                                                    | 4.60         | 2.30             | 3.70         | 1.15             | 3.70         | 1.47                         | 3.54                         | 2.93                           |
| 13           | 3.54                                                    | 3.54         | 1.77             | 2.87         | 0.88             | 2.87         | 1.13                         | 2.72                         | 2.26                           |
| 16           | 2.88                                                    | 2.88         | 1.44             | 2.31         | 0.72             | 2.31         | 0.92                         | 2.21                         | 1.83                           |
| 20           | 2.30                                                    | 2.30         | 1.15             | 1.85         | 0.58             | 1.85         | 0.74                         | 1.77                         | 1.47                           |
| 25           | 1.84                                                    | 1.84         | 0.92             | 1.48         | 0.46             | 1.48         | 0.59                         | 1.41                         | 1.17                           |
| 32           | 1.44                                                    | 1.44         | 0.72             | 1.16         | 0.36             | 1.16         | 0.46                         | 1.11                         | 0.92                           |
| 40           | 1.15                                                    | 1.15         | 0.58             | 0.92         | 0.29             | 0.92         | 0.37                         | 0.88                         | 0.73                           |
| 50           | 0.92                                                    | 0.92         | 0.46             | 0.74         | 0.23             | 0.74         | 0.30                         | 0.71                         | 0.59                           |
| 63           | 0.73                                                    | 0.73         | 0.37             | 0.59         | 0.18             | 0.59         | 0.24                         | 0.56                         | 0.47                           |
| 80           | 0.58                                                    | 0.58         | 0.29             | 0.46         | -                | -            | -                            | -                            | -                              |

<sup>1)</sup> According to EN 60364-4-41

<sup>2)</sup> If the measured value exceeds the table value, we recommend to use residual current circuit breaker.

<sup>3)</sup> Values for LTN-UC in DC network with  $U_0$  220 V or 440 V

## MINIATURE CIRCUIT BREAKERS LTN

### Correction of rated current $I_n$ for miniature circuit breakers LTN and LTN-UC

Correction of circuit breaker rated current  $I_n$  is determined by relation  $I_{n1} = K_T \times K_N \times I_n$  where:

$I_{n1}$  ... is corrected rated current of the circuit breaker

$I_n$  ... is rated current of the circuit breaker (i.e. the one placed separately at reference temperature 30 °C)

$K_T$  ... is correction factor taking ambient temperature into account

$K_N$  ... is correction factor taking into account placement of more loaded circuit breakers side-by-side

#### 1) Correction factor $K_T$

For concrete circuit breaker type ( $I_n$ , characteristic, number of poles), determine correction curve number (1, 2 or 3) in the table, and using the correction curve number and given ambient temperature on the graph, determine correction factor  $K_T$ .

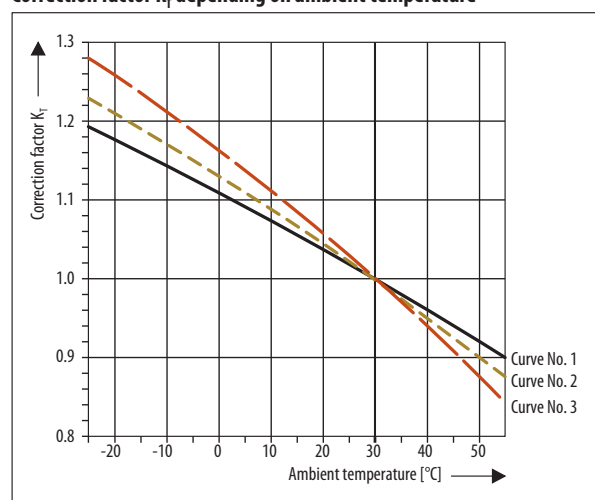
| Characteristic | Number of poles | Rated current of the circuit breaker I <sub>n</sub> [A] |     |   |     |   |   |   |   |    |    |    |    |    |    |    |    |    |    |
|----------------|-----------------|---------------------------------------------------------|-----|---|-----|---|---|---|---|----|----|----|----|----|----|----|----|----|----|
|                |                 | 0.3                                                     | 0.5 | 1 | 1.6 | 2 | 4 | 6 | 8 | 10 | 13 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 |
|                |                 | Correction curve number                                 |     |   |     |   |   |   |   |    |    |    |    |    |    |    |    |    |    |
| B              | 1, 1+N, 2       | -                                                       | -   | - | -   | 2 | 3 | 3 | - | 3  | 2  | 2  | 3  | 3  | 2  | 3  | 2  | 3  | 2  |
|                | 3, 3+N          | -                                                       | -   | - | -   | 2 | 3 | 2 | - | 2  | 1  | 2  | 2  | 1  | 1  | 1  | 1  | 1  | 1  |
| C              | 1, 1+N, 2       | 3                                                       | 3   | 2 | 2   | 2 | 3 | 3 | 3 | 3  | 2  | 3  | 3  | 2  | 2  | 3  | 2  | 3  | 2  |
|                | 3, 3+N          | 2                                                       | 2   | 2 | 1   | 2 | 2 | 2 | 3 | 3  | 2  | 2  | 2  | 2  | 1  | 1  | 1  | 2  | 1  |
| D              | 1, 1+N, 2       | 3                                                       | 3   | 2 | 2   | 2 | 3 | 3 | 3 | 3  | 2  | 3  | 3  | 2  | 2  | 3  | 2  | 3  | -  |
|                | 3, 3+N          | 2                                                       | 2   | 2 | 1   | 2 | 2 | 2 | 2 | 3  | 2  | 2  | 2  | 2  | 2  | 2  | 1  | 2  | -  |

#### 2) Correction factor $K_N$

Determine correction factor  $K_N$  according to the number of circuit breakers placed side-by-side.

| Correction factor $K_N$ depending on ambient temperature |      |       |       |      |
|----------------------------------------------------------|------|-------|-------|------|
| Number of miniature circuit breakers LTN side-by-side    | 1    | 2 ÷ 3 | 4 ÷ 6 | > 7  |
| Correction factor $K_N$                                  | 1.00 | 0.90  | 0.88  | 0.85 |

#### Correction factor $K_T$ depending on ambient temperature



#### Example

Task:

how rated current  $I_n = 32$  A will change for circuit breaker LTN-32B-1 at ambient temperature 10 °C and for 4 circuit breakers placed side-by-side?

Determination of  $K_T$ : for characteristic B, number of poles 1 and  $I_n$  32 A it is possible to take correction curve No. 2 from the table. For intersection of the correction curve No. 2 and ambient temperature 10 °C it is possible to determine correction factor  $K_T = 1.08$  on the vertical scale of the graph.

Determination of  $K_N$ : for 4 circuit breakers LTN-32B-1 placed side-by-side it is possible to determine from the table correction factor  $K_N = 0.88$ .

Correction  $I_{n1}$ : new rated current  $I_{n1} = K_T \times K_N \times I_n = 1.08 \times 0.88 \times 32 \text{ A} = 30.41 \text{ A}$

### Correction of tripping characteristic depending on frequency for miniature circuit breakers LTN, LTN-UC

■ Reference frequency: 50 Hz.

#### Thermal release

| $I_n$<br>[A] | Correction factor |           |       |        |        |          |
|--------------|-------------------|-----------|-------|--------|--------|----------|
|              | 0 Hz              | 16 2/3 Hz | 50 Hz | 125 Hz | 400 Hz | 1 000 Hz |
| 0.3 ÷ 10     | 1                 | 1         | 1     | 1      | 0.99   | 0.97     |
| 13 ÷ 40      | 1                 | 1         | 1     | 0.98   | 0.97   | 0.93     |
| 50 ÷ 63      | 1                 | 1         | 1     | 0.97   | 0.92   | 0.85     |

#### Electromagnetic release

| $I_n$<br>[A] | Correction factor |           |       |        |        |          |
|--------------|-------------------|-----------|-------|--------|--------|----------|
|              | 0 Hz              | 16 2/3 Hz | 50 Hz | 125 Hz | 400 Hz | 1 000 Hz |
| 0.3 ÷ 63     | 1.4               | 1         | 1     | 1.2    | 1.4    | 1.7      |

#### Example:

■ For circuit breaker LTN-32B-1 in a circuit with frequency of 400 Hz, rated current is corrected  $I_n = 32 \times 0.97 = 31.04$  A.  
For characteristic B, range of electromagnetic release switching is changed to  $1.4 \times (3 \div 5)I_n = (4.2 \div 7)I_n$ .

■ For circuit breaker LTN-UC-50C-2 in a circuit with frequency of 125 Hz, rated current is corrected  $I_n = 50 \times 0.97 = 48.5$  A.  
For characteristic C, range of electromagnetic release switching is changed to  $1.2 \times (5 \div 10)I_n = (6 \div 12)I_n$ .

■ For circuit breaker LTN-UC-20C-1 in DC current (frequency 0 Hz), rated current is unchanged  $I_n = 20 \times 1 = 20$  A.  
For characteristic C, range of electromagnetic release switching is changed to  $1.4 \times (5 \div 10)I_n = (7 \div 14)I_n$ .

## MINIATURE CIRCUIT BREAKERS LTN

### Selectivity and short-circuit current with backup fuse

Selectivity of LTN miniature circuit breakers of characteristic B with backup fuses [kA]

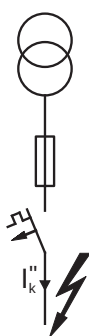
| $I_n$<br>[A] | Fuse of type gG |      |      |      |      |      |      |       |       |
|--------------|-----------------|------|------|------|------|------|------|-------|-------|
|              | 16 A            | 20 A | 25 A | 35 A | 50 A | 63 A | 80 A | 100 A | 125 A |
| 2            | 0.3             | 0.5  | 1.5  | 2.0  | 9.0  | 10.0 | 10.0 | 10.0  | 10.0  |
| 4            | 0.3             | 0.4  | 0.6  | 1.4  | 3.5  | 5.0  | 9.0  | 10.0  | 10.0  |
| 6            | 0.3             | 0.4  | 0.8  | 1.4  | 3.2  | 4.5  | 9.0  | 10.0  | 10.0  |
| 10           | -               | 0.4  | 0.7  | 1.2  | 2.5  | 3.5  | 5.0  | 10.0  | 10.0  |
| 13           | -               | -    | 0.7  | 1.2  | 2.5  | 3.5  | 5.0  | 10.0  | 10.0  |
| 16           | -               | -    | -    | 1.0  | 2.0  | 2.8  | 4.2  | 9.0   | 10.0  |
| 20           | -               | -    | -    | -    | 2.0  | 2.6  | 4.2  | 9.0   | 10.0  |
| 25           | -               | -    | -    | -    | 1.7  | 2.2  | 3.7  | 7.0   | 10.0  |
| 32           | -               | -    | -    | -    | 1.7  | 2.2  | 3.7  | 7.0   | 6.0   |
| 40           | -               | -    | -    | -    | -    | 1.6  | 2.2  | 4.0   | 6.0   |
| 50           | -               | -    | -    | -    | -    | -    | 2.2  | 4.0   | 6.0   |
| 63           | -               | -    | -    | -    | -    | -    | -    | 3.0   | 5.0   |

The time selectivity of particular combination up to the value of short-circuit current  $I_k''$  shown in the table is ensured in case of short-circuit behind the LTN circuit breaker with back-up fuse-link.

Which means that at short-circuit of particular combination under the  $I_k''$  value only the circuit breaker actuates. In case the short-circuit current value is bigger than  $I_k''$ , value then also the back-up fuse-link actuates.

#### Example:

Miniature circuit breaker LTN-10B-.. actuates earlier than back-up fuse-link with rated current 50 A up to short-circuit current 2.5 kA.



### Max. short-circuit current with backup fuse [kA] for miniature circuit breakers LTN

In case that short-circuit current passing through the circuit breaker is not known in the place of installation or is higher than breaking capacity of the circuit breaker, backup fuse must be used to eliminate circuit breaker overload.

| $I_n$<br>[A] | Backup fuse of gG type |      |      |       |       |       |         |
|--------------|------------------------|------|------|-------|-------|-------|---------|
|              | 50 A                   | 63 A | 80 A | 100 A | 125 A | 160 A | > 160 A |
| 0.3 ÷ 6      | 50                     | 50   | 50   | 50    | 50    | 50    | 45      |
| 8            | 50                     | 50   | 50   | 50    | 45    | 45    | 40      |
| 10           | 50                     | 50   | 50   | 50    | 45    | 45    | 40      |
| 13           | 50                     | 50   | 50   | 45    | 40    | 35    | 30      |
| 16           | 50                     | 50   | 50   | 45    | 40    | 35    | 30      |
| 20           | 50                     | 50   | 50   | 40    | 35    | 30    | 30      |
| 25           | 50                     | 50   | 50   | 40    | 35    | 30    | 30      |
| 32           | 50                     | 50   | 50   | 45    | 40    | 30    | 30      |
| 40           | 50                     | 50   | 50   | 45    | 40    | 30    | 20      |
| 50           | 50                     | 50   | 50   | 40    | 35    | 25    | 20      |
| 63           | 50                     | 50   | 45   | 40    | 35    | 25    | 20      |



Selectivity of LTN miniature circuit breakers of characteristic C with backup fuses [kA]

| $I_n$<br>[A] | Fuse of type gG |      |      |      |      |      |      |       |       |
|--------------|-----------------|------|------|------|------|------|------|-------|-------|
|              | 16 A            | 20 A | 25 A | 35 A | 50 A | 63 A | 80 A | 100 A | 125 A |
| ≤ 2          | 0.3             | 0.5  | 1.5  | 2.0  | 9.0  | 10.0 | 10.0 | 10.0  | 10.0  |
| 4            | 0.3             | 0.4  | 0.9  | 1.4  | 3.5  | 5.0  | 9.0  | 10.0  | 10.0  |
| 6            | -               | 0.4  | 0.8  | 1.4  | 2.7  | 4.5  | 6.0  | 10.0  | 10.0  |
| 8            | -               | -    | 0.6  | 1.2  | 2.2  | 3.5  | 5.0  | 7.0   | 10.0  |
| 10           | -               | -    | 0.5  | 1.2  | 2.0  | 3.0  | 4.2  | 7.0   | 10.0  |
| 13           | -               | -    | -    | 1.0  | 1.6  | 2.4  | 3.4  | 6.0   | 10.0  |
| 16           | -               | -    | -    | 1.0  | 1.5  | 2.2  | 3.0  | 6.0   | 10.0  |
| 20           | -               | -    | -    | -    | 1.3  | 2.2  | 3.0  | 6.0   | 10.0  |
| 25           | -               | -    | -    | -    | -    | 2.2  | 2.9  | 5.0   | 9.0   |
| 32           | -               | -    | -    | -    | -    | -    | 2.4  | 4.0   | 7.0   |
| 40           | -               | -    | -    | -    | -    | -    | 2.0  | 3.5   | 4.0   |
| 50           | -               | -    | -    | -    | -    | -    | -    | 3.0   | 4.0   |
| 63           | -               | -    | -    | -    | -    | -    | -    | 3.0   | 3.5   |

Selectivity of LTN miniature circuit breakers of characteristic D with backup fuses [kA]

| $I_n$<br>[A] | Fuse of type gG |      |      |      |      |      |      |       |       |
|--------------|-----------------|------|------|------|------|------|------|-------|-------|
|              | 16 A            | 20 A | 25 A | 35 A | 50 A | 63 A | 80 A | 100 A | 125 A |
| ≤ 2          | 0.3             | 0.4  | 1.0  | 1.8  | 5.0  | 7.0  | 10.0 | 10.0  | 10.0  |
| 4            | -               | 0.4  | 0.8  | 1.2  | 3.0  | 3.8  | 5.5  | 10.0  | 10.0  |
| 6            | -               | -    | 0.7  | 1.1  | 2.5  | 3.1  | 4.4  | 8.1   | 10.0  |
| 8            | -               | -    | -    | 0.9  | 2.1  | 2.5  | 3.5  | 6.2   | 9.3   |
| 10           | -               | -    | -    | -    | 2.1  | 2.5  | 3.5  | 6.2   | 9.3   |
| 13           | -               | -    | -    | -    | -    | 2.5  | 3.5  | 6.2   | 9.3   |
| 16           | -               | -    | -    | -    | -    | 2.2  | 3.1  | 5.1   | 7.5   |
| 20           | -               | -    | -    | -    | -    | -    | 2.7  | 4.3   | 6.3   |
| 25           | -               | -    | -    | -    | -    | -    | -    | 4.0   | 5.7   |
| 32           | -               | -    | -    | -    | -    | -    | -    | 4.0   | 5.5   |
| 40           | -               | -    | -    | -    | -    | -    | -    | 3.5   | 4.8   |
| 50           | -               | -    | -    | -    | -    | -    | -    | -     | 4.0   |
| 63           | -               | -    | -    | -    | -    | -    | -    | -     | -     |

## MINIATURE CIRCUIT BREAKERS LTN

### Switching of light circuits with miniature circuit breakers

#### A) Switching of light fittings with fluorescent tube light source with electronic ballast in circuit with miniature circuit breakers LTN and LTN-UC

The table below shows the maximum permitted number of light fittings with fluorescent tube light source connected after a miniature circuit breaker – in this configuration the miniature circuit breaker will not switch off at circuit (light fittings) switching.

#### Maximum number of light fittings (pcs) with fluorescent tube light source

| Rated current<br>of the circuit breaker $I_n$ [A] | P<br>[W] | Switching of all light fittings simultaneously at 230 V <sup>1)</sup> |     |     |                                    |     |     | Switching of light fittings by groups at 230 V <sup>2)</sup> |     |     |                                    |     |     |
|---------------------------------------------------|----------|-----------------------------------------------------------------------|-----|-----|------------------------------------|-----|-----|--------------------------------------------------------------|-----|-----|------------------------------------|-----|-----|
|                                                   |          | Light contains 1 fluorescent tube                                     |     |     | Light contains 2 fluorescent tubes |     |     | Light contains 1 fluorescent tube                            |     |     | Light contains 2 fluorescent tubes |     |     |
|                                                   |          | B                                                                     | C   | D   | B                                  | C   | D   | B                                                            | C   | D   | B                                  | C   | D   |
| 6                                                 | 18       | 17                                                                    | 37  | 66  | 17                                 | 35  | 35  | 66                                                           | 66  | 66  | 35                                 | 35  | 35  |
|                                                   | 36       | 17                                                                    | 37  | 37  | 17                                 | 19  | 19  | 37                                                           | 37  | 37  | 19                                 | 19  | 19  |
|                                                   | 58       | 17                                                                    | 19  | 19  | 12                                 | 12  | 12  | 19                                                           | 19  | 19  | 12                                 | 12  | 12  |
| 8                                                 | 18       | -                                                                     | 50  | 88  | -                                  | 47  | 47  | -                                                            | 88  | 88  | -                                  | -   | 47  |
|                                                   | 36       | -                                                                     | 50  | 50  | -                                  | 25  | 25  | -                                                            | 50  | 50  | -                                  | 25  | 25  |
|                                                   | 58       | -                                                                     | 25  | 25  | -                                  | 16  | 16  | -                                                            | 25  | 25  | -                                  | 16  | 16  |
| 10                                                | 18       | 36                                                                    | 67  | 111 | 36                                 | 58  | 58  | 111                                                          | 111 | 111 | 58                                 | 58  | 58  |
|                                                   | 36       | 36                                                                    | 62  | 62  | 32                                 | 32  | 32  | 62                                                           | 62  | 62  | 32                                 | 32  | 32  |
|                                                   | 58       | 32                                                                    | 32  | 32  | 20                                 | 20  | 20  | 32                                                           | 32  | 32  | 20                                 | 20  | 20  |
| 13                                                | 18       | 44                                                                    | 81  | 144 | 44                                 | 76  | 76  | 144                                                          | 144 | 144 | 76                                 | 76  | 76  |
|                                                   | 36       | 44                                                                    | 81  | 81  | 41                                 | 41  | 41  | 81                                                           | 81  | 81  | 41                                 | 41  | 41  |
|                                                   | 58       | 41                                                                    | 41  | 41  | 26                                 | 26  | 26  | 41                                                           | 41  | 41  | 26                                 | 26  | 26  |
| 16                                                | 18       | 56                                                                    | 100 | 177 | 56                                 | 94  | 94  | 177                                                          | 177 | 177 | 94                                 | 94  | 94  |
|                                                   | 36       | 56                                                                    | 100 | 100 | 51                                 | 51  | 51  | 100                                                          | 100 | 100 | 51                                 | 51  | 51  |
|                                                   | 58       | 51                                                                    | 51  | 51  | 32                                 | 32  | 32  | 51                                                           | 51  | 51  | 32                                 | 32  | 32  |
| 20                                                | 18       | 70                                                                    | 117 | 222 | 70                                 | 117 | 117 | 222                                                          | 222 | 222 | 117                                | 117 | 117 |
|                                                   | 36       | 70                                                                    | 117 | 125 | 64                                 | 64  | 64  | 125                                                          | 125 | 125 | 64                                 | 64  | 64  |
|                                                   | 58       | 64                                                                    | 64  | 64  | 40                                 | 40  | 40  | 64                                                           | 64  | 64  | 40                                 | 40  | 40  |
| 25                                                | 18       | 85                                                                    | 157 | 277 | 85                                 | 147 | 147 | 277                                                          | 277 | 277 | 147                                | 147 | 147 |
|                                                   | 36       | 85                                                                    | 156 | 156 | 80                                 | 80  | 80  | 156                                                          | 156 | 156 | 80                                 | 80  | 80  |
|                                                   | 58       | 80                                                                    | 80  | 80  | 51                                 | 51  | 51  | 80                                                           | 80  | 80  | 51                                 | 51  | 51  |
| 32                                                | 18       | 100                                                                   | 144 | 355 | 100                                | 144 | 188 | 355                                                          | 355 | 355 | 188                                | 188 | 188 |
|                                                   | 36       | 100                                                                   | 144 | 200 | 100                                | 103 | 103 | 200                                                          | 200 | 200 | 103                                | 103 | 103 |
|                                                   | 58       | 100                                                                   | 103 | 103 | 65                                 | 65  | 65  | 103                                                          | 103 | 103 | 65                                 | 65  | 65  |
| 40                                                | 18       | 126                                                                   | 216 | 444 | 126                                | 216 | 235 | 444                                                          | 444 | 444 | 235                                | 235 | 235 |
|                                                   | 36       | 126                                                                   | 216 | 250 | 126                                | 129 | 129 | 250                                                          | 250 | 250 | 129                                | 129 | 129 |
|                                                   | 58       | 126                                                                   | 129 | 129 | 81                                 | 81  | 81  | 129                                                          | 129 | 129 | 81                                 | 81  | 81  |
| 50                                                | 18       | 180                                                                   | 247 | 555 | 180                                | 247 | 294 | 555                                                          | 555 | 555 | 294                                | 294 | 294 |
|                                                   | 36       | 180                                                                   | 247 | 312 | 161                                | 161 | 161 | 312                                                          | 312 | 312 | 161                                | 161 | 161 |
|                                                   | 58       | 161                                                                   | 161 | 161 | 102                                | 102 | 102 | 161                                                          | 161 | 161 | 102                                | 102 | 102 |
| 63                                                | 18       | 170                                                                   | 340 | 567 | 170                                | 340 | 370 | 700                                                          | 700 | 700 | 370                                | 370 | 370 |
|                                                   | 36       | 170                                                                   | 340 | 393 | 170                                | 203 | 203 | 393                                                          | 393 | 393 | 203                                | 203 | 203 |
|                                                   | 58       | 170                                                                   | 203 | 203 | 128                                | 128 | 128 | 203                                                          | 203 | 203 | 128                                | 128 | 128 |

<sup>1)</sup> All electronic ballasts are switched on at the same time.

<sup>2)</sup> Electronic ballasts are switched on one after the other.

#### Influence of circuit impedance on maximum number of light fittings

The maximum permitted number of light fittings listed above considers circuit impedance 800 mΩ. At impedance 400 mΩ the maximum permitted number of light fittings is reduced by 10 %.

#### Example:

In case of a miniature circuit breaker LTN-10B-1, a light fitting equipped by one fluorescent tube 36 W and at switching of all light fittings simultaneously, the maximum number of such light fittings is 36 pcs.

## MINIATURE CIRCUIT BREAKERS LTN

### B) Switching lighting fittings with HQ, HQI and NAV lighting source in the circuit with miniature circuit breakers LTN and LTN-UC

HQ - mercury discharge lamps

HQI - metal halide discharge lamp

NAV - sodium discharge lamp

The below tables determine:

- power and current of lighting fittings with HQ, HQI and NAV lighting source
- max. permitted number of lighting devices with HQ, HQI and NAV lighting source connected downstream of the circuit breaker - with this configuration, the circuit breaker does not trip in circuit (lighting fittings) switching on.

#### Power and current of lighting fittings with HQ, HQI and NAV lighting source

|                                        |     | Power output / lighting fitting [W] |     |     |     |     |       |       |       |
|----------------------------------------|-----|-------------------------------------|-----|-----|-----|-----|-------|-------|-------|
|                                        |     | 35                                  | 70  | 150 | 250 | 400 | 1 000 | 2 000 | 3 500 |
| Current / lighting fitting             | [A] | 0.5                                 | 1   | 1.8 | 3   | 3.5 | 9.5   | 10.3  | 18    |
| Current / compensated lighting fitting | [A] | 0.3                                 | 0.5 | 1   | 1.5 | 2   | 6     | 5.5   | 9.8   |
| Starting current / lighting fitting    | [A] | 10                                  | 18  | 36  | 60  | 70  | 120   | 125   | 220   |

#### Max. permitted number (pieces) of lighting fittings with HQ, HQI and NAV lighting source connected downstream of the circuit breaker

| Rated current of the circuit breaker $I_n$ [A] |    | Power output / lighting fitting [W] |    |     |     |     |       |       |       |
|------------------------------------------------|----|-------------------------------------|----|-----|-----|-----|-------|-------|-------|
|                                                |    | 35                                  | 70 | 150 | 250 | 400 | 1 000 | 2 000 | 3 500 |
| Characteristic B                               | 6  | 2                                   | 1  | -   | -   | -   | -     | -     | -     |
|                                                | 10 | 5                                   | 3  | 1   | 1   | -   | -     | -     | -     |
|                                                | 13 | 7                                   | 4  | 2   | 1   | 1   | -     | -     | -     |
|                                                | 16 | 8                                   | 5  | 2   | 1   | 1   | -     | -     | -     |
|                                                | 20 | 11                                  | 6  | 3   | 1   | 1   | 1     | 1     | -     |
|                                                | 25 | 13                                  | 7  | 3   | 2   | 2   | 1     | 1     | -     |
|                                                | 32 | 16                                  | 8  | 4   | 2   | 2   | 1     | 1     | -     |
|                                                | 40 | 20                                  | 11 | 5   | 3   | 3   | 1     | 1     | 1     |
|                                                | 50 | 28                                  | 15 | 7   | 4   | 4   | 2     | 2     | 1     |
|                                                | 63 | 26                                  | 14 | 7   | 4   | 3   | 2     | 2     | 1     |
| Characteristic C                               | 6  | 6                                   | 3  | 1   | 1   | -   | -     | -     | -     |
|                                                | 8  | 8                                   | 4  | 2   | 1   | 1   | -     | -     | -     |
|                                                | 10 | 10                                  | 6  | 3   | 1   | 1   | -     | -     | -     |
|                                                | 13 | 13                                  | 7  | 3   | 2   | 1   | 1     | 1     | -     |
|                                                | 16 | 16                                  | 9  | 4   | 2   | 2   | 1     | 1     | -     |
|                                                | 20 | 18                                  | 10 | 5   | 3   | 2   | 1     | 1     | -     |
|                                                | 25 | 25                                  | 14 | 7   | 4   | 3   | 2     | 1     | 1     |
|                                                | 32 | 22                                  | 12 | 6   | 3   | 3   | 2     | 1     | 1     |
|                                                | 40 | 33                                  | 18 | 9   | 5   | 4   | 2     | 2     | 1     |
|                                                | 50 | 38                                  | 21 | 10  | 6   | 5   | 3     | 3     | 1     |
| Characteristic D                               | 63 | 53                                  | 29 | 14  | 9   | 7   | 4     | 4     | 2     |
|                                                | 6  | 8                                   | 4  | 2   | 1   | 1   | -     | -     | -     |
|                                                | 8  | 11                                  | 5  | 3   | 2   | 1   | -     | -     | -     |
|                                                | 10 | 14                                  | 7  | 4   | 2   | 2   | -     | -     | -     |
|                                                | 13 | 18                                  | 9  | 5   | 3   | 2   | 1     | 1     | -     |
|                                                | 16 | 22                                  | 11 | 6   | 3   | 3   | 1     | 1     | -     |
|                                                | 20 | 28                                  | 14 | 7   | 4   | 4   | 1     | 1     | -     |
|                                                | 25 | 35                                  | 17 | 9   | 5   | 5   | 2     | 1     | 1     |
|                                                | 32 | 44                                  | 22 | 12  | 7   | 6   | 2     | 2     | 1     |
|                                                | 40 | 56                                  | 28 | 15  | 9   | 8   | 3     | 2     | 1     |
|                                                | 50 | 70                                  | 35 | 19  | 11  | 10  | 4     | 3     | 2     |
|                                                | 63 | 88                                  | 44 | 24  | 14  | 12  | 4     | 4     | 2     |

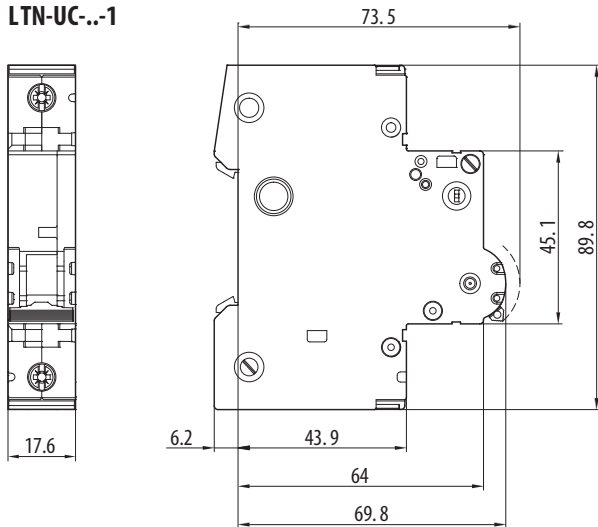
#### Example:

In case of circuit breaker LTN-10B-1, max. permitted number of lighting fittings is 5 pieces for lighting fitting with unit power of 35 W. Operating current is  $0.5 \times 5 = 2.5$  A. Operating current is  $0.3 \times 5 = 1.5$  A for compensated lighting fitting. The starting current is  $10 \times 5 = 50$  A.

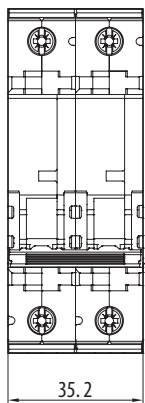
## MINIATURE CIRCUIT BREAKERS LTN

### Dimensions

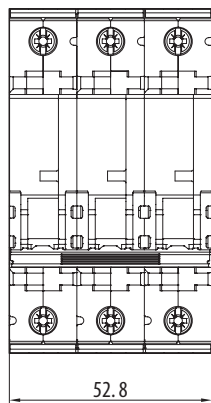
LTN-...-1  
LTN-UC-...-1



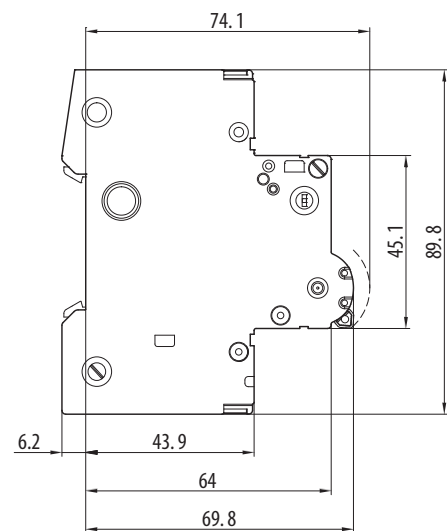
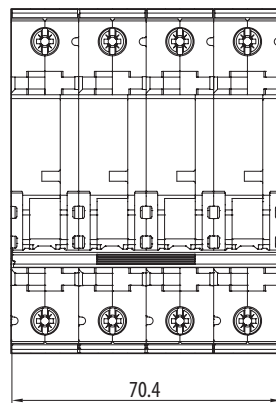
LTN-...-2  
LTN-...-1N  
LTN-UC-...-2



LTN-...-3



LTN-...-3N

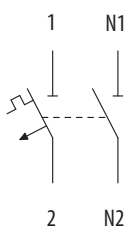


### Diagram

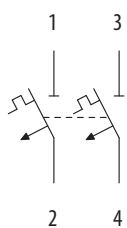
LTN-...-1



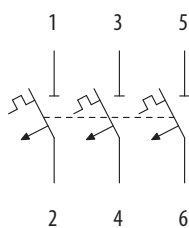
LTN-...-1N



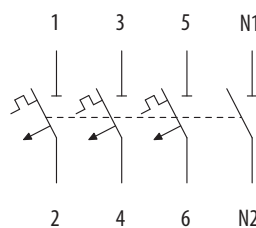
LTN-...-2



LTN-...-3



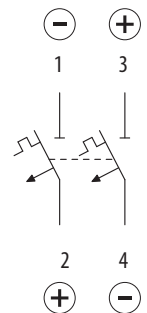
LTN-...-3N



LTN-UC-...-1

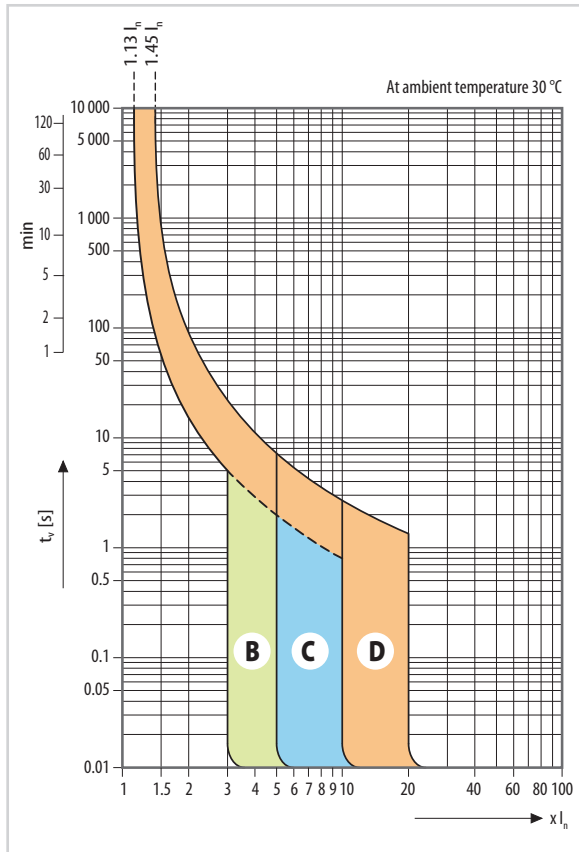


LTN-UC-...-2



## MINIATURE CIRCUIT BREAKERS LTN

### Characteristics LTN in AC circuit <sup>1)</sup>



<sup>1)</sup> In DC circuit, limits of electromagnetic release are changed with correction factor 1.4.  
Characteristic B:  $(4.2 \div 7) I_n$  / C:  $(7 \div 14) I_n$  / D:  $(14 \div 28) I_n$

- **Characteristic B:** for protection of line of electrical circuits with equipment, which does not cause current surges. The short-circuit release is set to  $(3 \div 5) I_n$ .
- **Characteristic C:** for protection of line of electrical circuits with equipment, which causes current surges. The short-circuit release is set to  $(5 \div 10) I_n$ .
- **Characteristic D:** for protection of line of electrical circuits with equipment, which causes high current surges. The short-circuit release is set to  $(10 \div 20) I_n$ .

### Tripping characteristics of circuit breakers according to EN 60898-1

| Thermal release                   |                                                                                                                | Tripping characteristic type |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------|------------------------------|
|                                   |                                                                                                                | B, C, D                      |
| Conventional non-tripping current | $I_{nt}$ for $t \geq 1$ hr (for $I_n \leq 63$ A)<br>$I_{nt}$ for $t \geq 2$ hr (for $I_n > 63$ A)              | $I_{nt} = 1.13 I_n$          |
| Conventional tripping current     | $I_{nt}$ for $t < 1$ hr (for $I_n \leq 63$ A)<br>$I_{nt}$ for $t < 2$ hr (for $I_n > 63$ A)                    | $I_t = 1.45 I_n$             |
| Current $I_3$ for                 | $1 \text{ s} < t < 60 \text{ s}$ (for $I_n \leq 32$ A)<br>$1 \text{ s} < t < 120 \text{ s}$ (for $I_n > 32$ A) | $I_3 = 2.55 I_n$             |

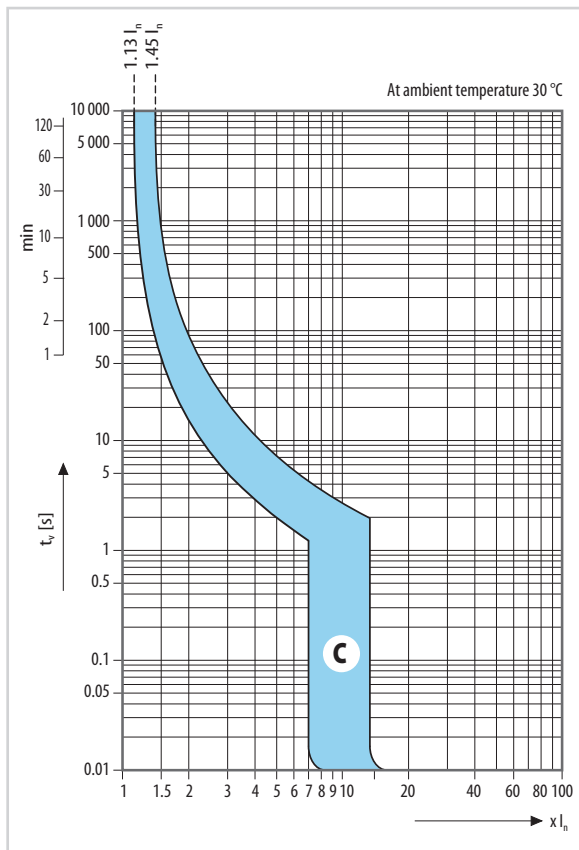
t - break time of the circuit breaker

| Electromagnetic release |                                                                       | Tripping characteristic type |                |                |
|-------------------------|-----------------------------------------------------------------------|------------------------------|----------------|----------------|
|                         |                                                                       | B                            | C              | D              |
| Current $I_4$ for       | $0.1 \text{ s} < t < 45 \text{ s}$ (for $I_n \leq 32$ A)              | $I_4 = 3 I_n$                |                |                |
|                         | $0.1 \text{ s} < t < 90 \text{ s}$ (for $I_n > 32$ A)                 |                              |                |                |
|                         | $0.1 \text{ s} < t < 15 \text{ s}$ (for $I_n \leq 32$ A)              |                              | $I_4 = 5 I_n$  |                |
|                         | $0.1 \text{ s} < t < 30 \text{ s}$ (for $I_n > 32$ A)                 |                              |                |                |
|                         | $0.1 \text{ s} < t < 4 \text{ s}$ <sup>1)</sup> (for $I_n \leq 32$ A) |                              |                | $I_4 = 10 I_n$ |
| Current $I_5$ for       | $0.1 \text{ s} < t < 8 \text{ s}$ (for $I_n > 32$ A)                  |                              |                |                |
|                         | $t < 0.1 \text{ s}$                                                   | $I_5 = 5 I_n$                | $I_5 = 10 I_n$ | $I_5 = 20 I_n$ |

t - break time of the circuit breaker

<sup>1)</sup> For  $I_n \leq 10$  A is permissible that  $t < 8$  s.

### Characteristics LTN-UC in DC circuit <sup>2)</sup>



<sup>2)</sup> In AC circuit, limits of electromagnetic release are changed.  
Characteristic C:  $(7 \div 14) I_n$

### Tripping characteristics of circuit breakers according to EN 60898-2

| Thermal release                   |                                                                                                                | Tripping characteristic type |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------|------------------------------|
|                                   |                                                                                                                | C                            |
| Conventional non-tripping current | $I_{nt}$ for $t \geq 1$ hr (for $I_n \leq 63$ A)                                                               | $I_{nt} = 1.13 I_n$          |
| Conventional tripping current     | $I_{nt}$ for $t < 1$ hr (for $I_n \leq 63$ A)                                                                  | $I_t = 1.45 I_n$             |
| Current $I_3$ for                 | $1 \text{ s} < t < 60 \text{ s}$ (for $I_n \leq 32$ A)<br>$1 \text{ s} < t < 120 \text{ s}$ (for $I_n > 32$ A) | $I_3 = 2.55 I_n$             |

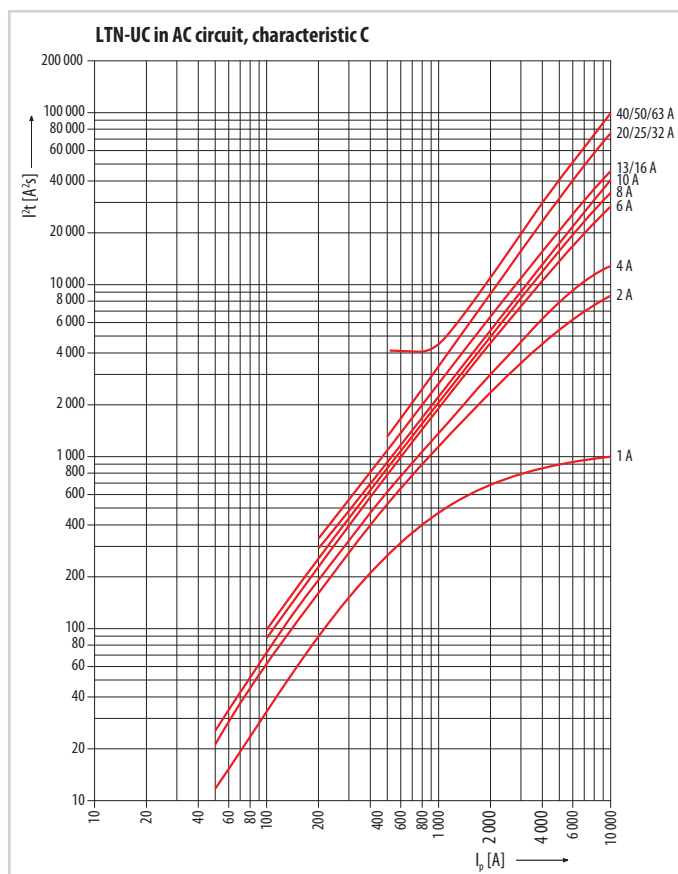
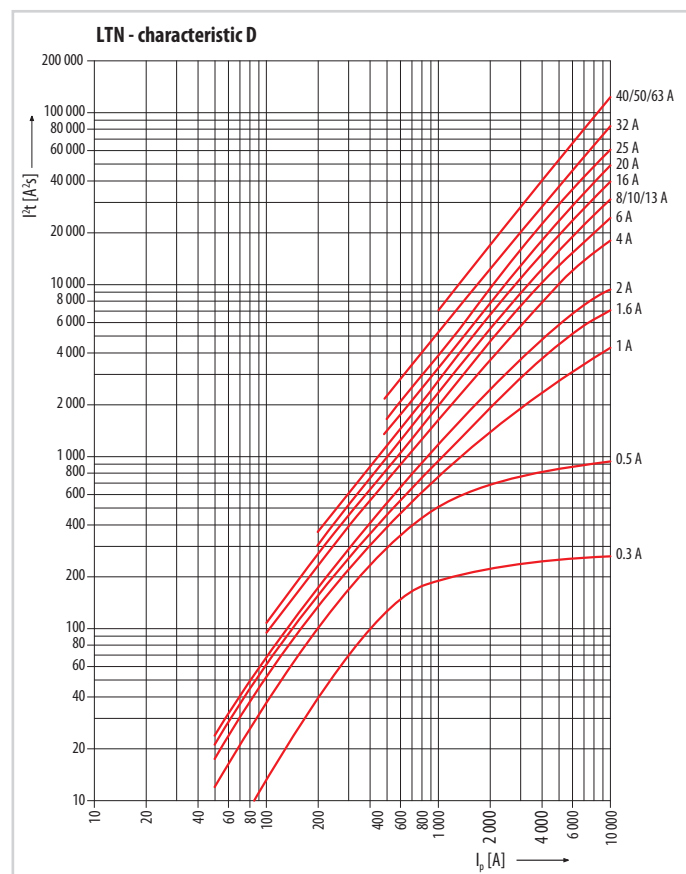
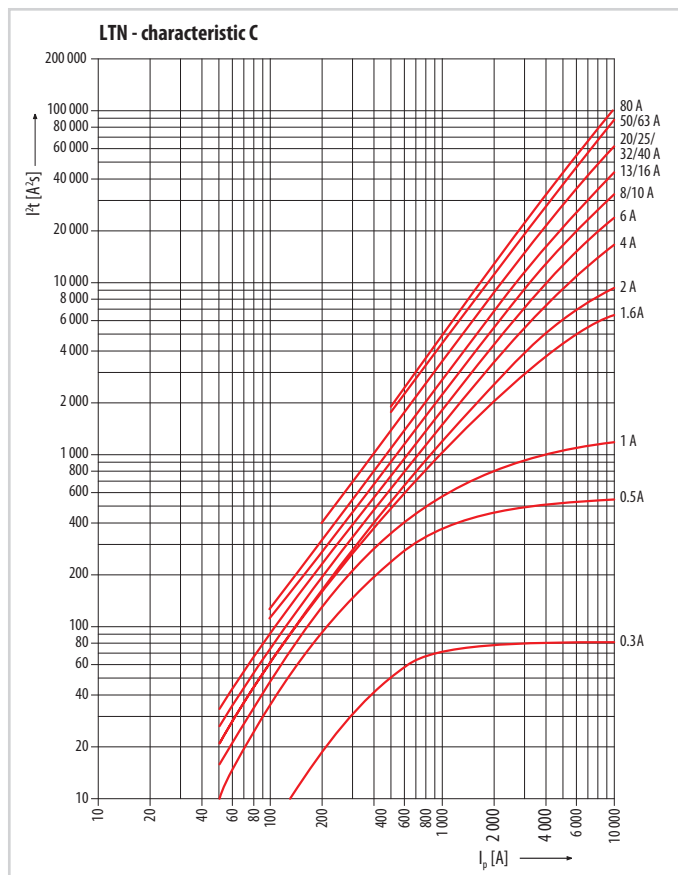
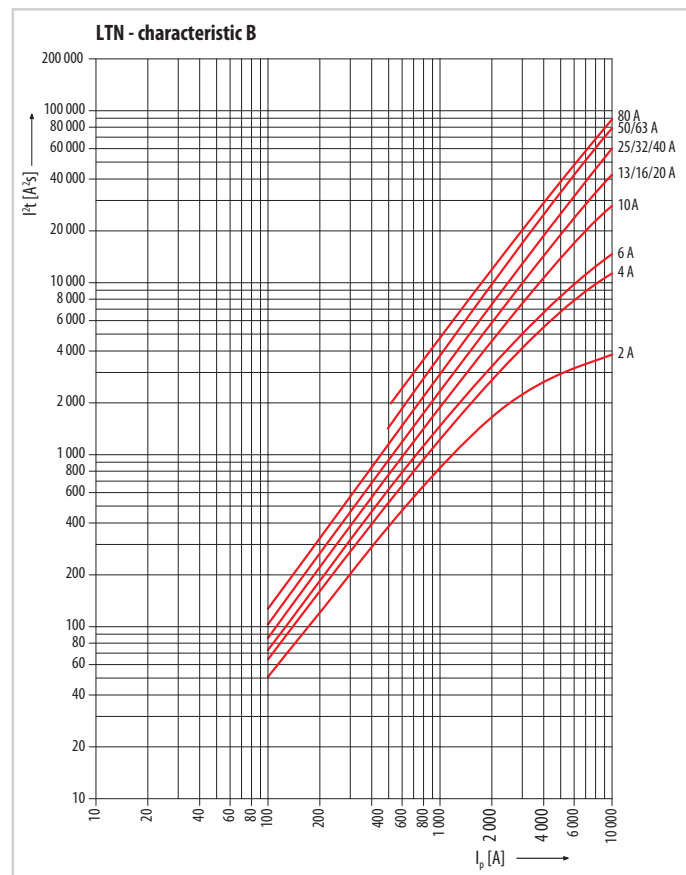
t - break time of the circuit breaker

| Electromagnetic release |                                                          | Characteristic C |                |
|-------------------------|----------------------------------------------------------|------------------|----------------|
|                         |                                                          | AC circuit       | DC circuit     |
| Current $I_4$ for       | $0.1 \text{ s} < t < 15 \text{ s}$ (for $I_n \leq 32$ A) | $I_4 = 5 I_n$    | $I_4 = 7 I_n$  |
|                         | $0.1 \text{ s} < t < 30 \text{ s}$ (for $I_n > 32$ A)    |                  |                |
| Current $I_5$ for       | $t < 0.1 \text{ s}$                                      | $I_5 = 10 I_n$   | $I_5 = 15 I_n$ |

t - break time of the circuit breaker

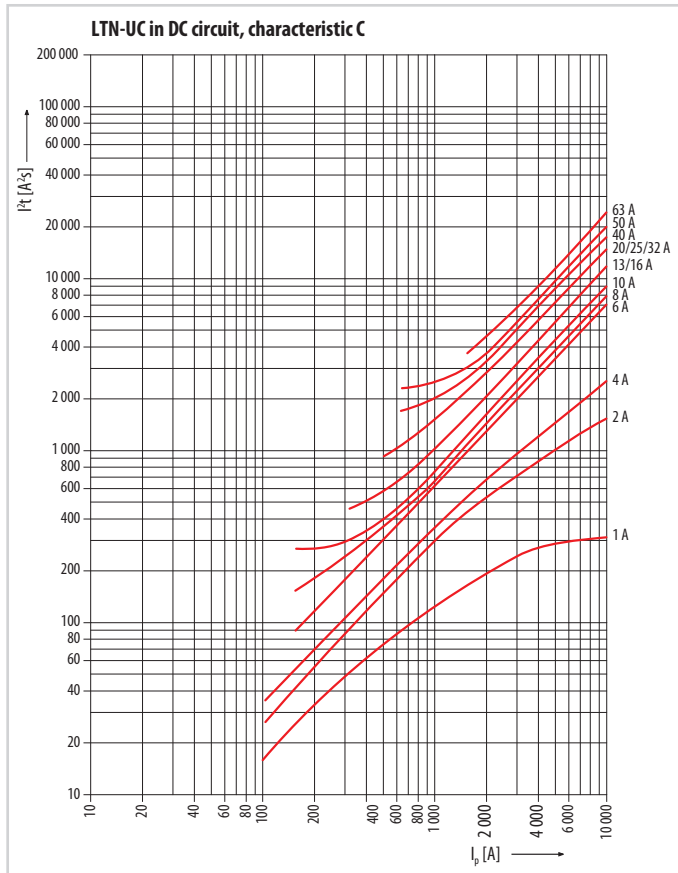
# MINIATURE CIRCUIT BREAKERS LTN

## Characteristics $I^2t$



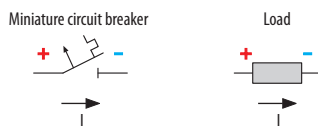
## MINIATURE CIRCUIT BREAKERS LTN

### Characteristics $I^2t$

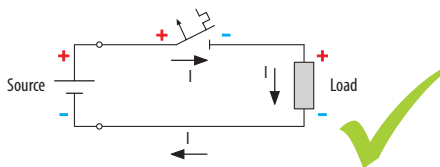


Correct polarity connection of DC circuit breakers, loads etc. in the circuit has to follow the direction of current flow in DC circuit that is from (+) to (-).

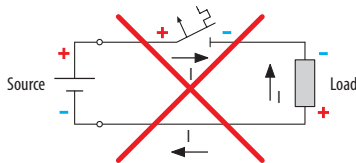
Example of current flow according to polarity is shown by the arrow:



1) **Correct connection of devices** = equal direction of current flow on the devices



2) **Wrong connection of devices** = contradictory current flow on the devices



The correct connection of devices (point 1) seems to be illogical due to connection of load terminal (+) and circuit breaker terminal (-). However, it is **correct connection**.

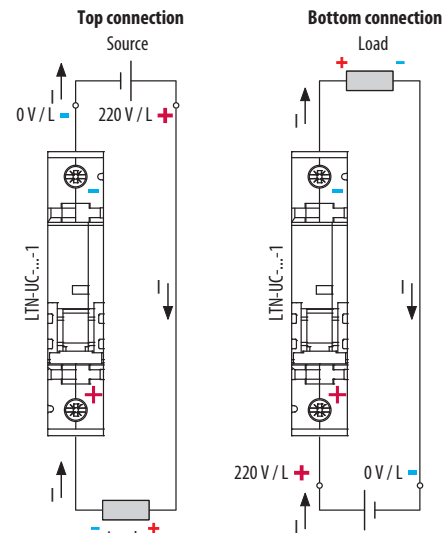
### Protection of DC circuits

For protection of DC circuits it is possible to use LTN-UC, LTN, LVN, LVN-DC circuit breakers depending on voltage.

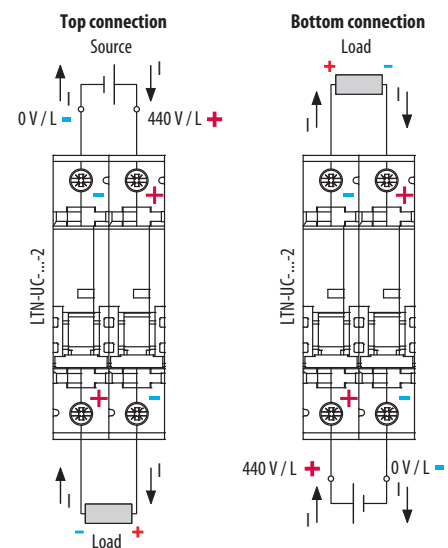
| Circuit breaker            | DC voltage  |                 |
|----------------------------|-------------|-----------------|
| Type                       | $I_n$ [A]   | Width [modules] |
| LTN-UC-...-1 <sup>1)</sup> | up to 63 A  | 1               |
| LTN-UC-...-2 <sup>1)</sup> | up to 63 A  | 2               |
| LVN-DC-...-2 <sup>1)</sup> | up to 125 A | 3               |
| LTN-...-1                  | up to 80 A  | 1               |
| LTN-...-2                  | up to 80 A  | 2               |
| LTN-...-3                  | up to 80 A  | 3               |
| LVN-...-1                  | up to 125 A | 1.5             |
| LVN-...-3                  | up to 125 A | 4.5             |
| LVN-...-4                  | up to 125 A | 6               |

<sup>1)</sup> It is necessary to keep the polarity marked on the circuit breaker.

#### 1-pole connection of LTN-UC



#### 2-pole connection of LTN-UC



## ACCESSORIES



PS-LT-1100

## Auxiliary switches

- Accessory to:
  - miniature circuit breakers: LTP, LTK, LTS, LTN, LTN-UC, LVN, LVN-DC
  - residual current circuit breakers: LFN, LFE
  - residual current circuit breakers with overcurrent protection: OLI, OLE (installation on OLI/OLE requires handle adapter OD-OL-NR01 see page B46 except for PS-LT-1100-K)
  - switches: MSO, MSN, AVN-DC.
- For signalling the position of contacts of the device in switching off by releases or manually, i.e. in switching off by overload, short-circuit, shunt trip or undervoltage release, residual current and manually by control lever.
- Mounting on the right side of the device.
- For the number of auxiliary switches connected to the device in combination with the other accessories see page B53, B54.
- Width 9 mm.
- Auxiliary switch function can be checked by test lever on the front side of the device (version PS-...-TE).
- Variant for switching small direct current voltages up to DC 30 V.
- They are suitable for application in SELV and PELV circuits - sufficient insulation is provided between the circuit breaker and the auxiliary switch.

| Design                                       | Arrangement of contacts <sup>1)</sup> | Type                    | Order code | Number of modules | Weight [kg] | Package [pcs] |
|----------------------------------------------|---------------------------------------|-------------------------|------------|-------------------|-------------|---------------|
| Standard                                     | 1100                                  | <b>PS-LT-1100</b>       | OEZ:42297  | 0.5               | 0.065       | 1             |
|                                              | 2000                                  | <b>PS-LT-2000</b>       | OEZ:42299  | 0.5               | 0.071       | 1             |
|                                              | 0200                                  | <b>PS-LT-0200</b>       | OEZ:42298  | 0.5               | 0.065       | 1             |
|                                              | 0010                                  | <b>PS-LT-0010</b>       | OEZ:45595  | 0.5               | 0.051       | 1             |
| With test and reset lever                    | 1100                                  | <b>PS-LT-1100-TE</b>    | OEZ:42300  | 0.5               | 0.054       | 1             |
|                                              | 2000                                  | <b>PS-LT-2000-TE</b>    | OEZ:42302  | 0.5               | 0.058       | 1             |
|                                              | 0200                                  | <b>PS-LT-0200-TE</b>    | OEZ:42301  | 0.5               | 0.080       | 1             |
| For small voltages standard                  | 1100                                  | <b>PS-LT-1100-MN</b>    | OEZ:42303  | 0.5               | 0.075       | 1             |
| For small voltages with test lever           | 1100                                  | <b>PS-LT-1100-MN-TE</b> | OEZ:42304  | 0.5               | 0.054       | 1             |
| With handle adapter OD-OL-NR01 <sup>2)</sup> | 1100                                  | <b>PS-LT-1100-K</b>     | OEZ:42305  | 0.5               | 0.065       | 1             |
| Combined with signal contact <sup>3)</sup>   | 0011                                  | <b>PS-LT-0011</b>       | OEZ:46050  | 0.5               | 0.056       | 1             |

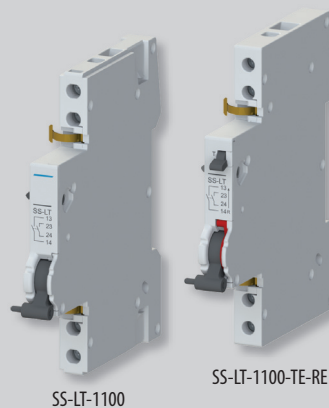
<sup>1)</sup> Each digit indicates successively the number of make, break, auxiliary make-and-break and signal make-and-break contacts.

<sup>2)</sup> PS-LT-1100-K is a set for convenient ordering in installation on OLI/OLE. The other designs of the auxiliary switches installed on OLI/OLE require separate ordering of OD-OL-NR01.

<sup>3)</sup> Signal contact: for position signalling of main contacts of the device in switching off by releases, i.e. in switching off by overload, short-circuit, shunt trip and undervoltage release or residual current.

## Signal switches

- Accessory to:
  - miniature circuit breakers: LTP, LTK, LTS, LTN, LTN-UC, LVN, LVN-DC
  - residual current circuit breakers: LFN, LFE
  - residual current circuit breakers with overcurrent protection: OLI, OLE (installation on OLI/OLE requires handle adapter OD-OL-NR01 see page B46)
  - switches: MSN.
- For position signalling of main contacts of the device in switching off by releases, i.e. in switching off by overload, short-circuit, shunt trip and undervoltage release or residual current.
- Mounting on the right side of the device.
- For the number of auxiliary switches connected to the device in combination with the other accessories see page B53, B54.
- Auxiliary switch function can be checked by test lever on the front side of the device (version SS-...-TE).
- Signal switch can be reset by means of the red reset lever on the front side of the device without switching the device on by the control lever (version SS-...-RE).
- They are suitable for application in SELV and PELV circuits - sufficient insulation is provided between the circuit breaker and the signal switch.
- Reaction in switching off by releases: in switching off by releases the make/break contact will break/make – for details see the table on page B48.

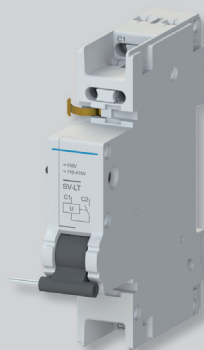


SS-LT-1100

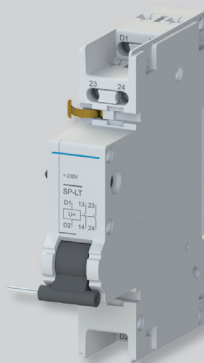
| Design                    | Arrangement of contacts <sup>1)</sup> | Type                    | Order code | Number of modules | Weight [kg] | Package [pcs] |
|---------------------------|---------------------------------------|-------------------------|------------|-------------------|-------------|---------------|
| Standard                  | 11                                    | <b>SS-LT-1100</b>       | OEZ:42306  | 0.5               | 0.065       | 1             |
|                           | 20                                    | <b>SS-LT-2000</b>       | OEZ:42307  | 0.5               | 0.075       | 1             |
|                           | 02                                    | <b>SS-LT-0200</b>       | OEZ:42308  | 0.5               | 0.078       | 1             |
| With test and reset lever | 11                                    | <b>SS-LT-1100-TE-RE</b> | OEZ:42309  | 0.5               | 0.055       | 1             |
|                           | 20                                    | <b>SS-LT-2000-TE-RE</b> | OEZ:42310  | 0.5               | 0.057       | 1             |
|                           | 02                                    | <b>SS-LT-0200-TE-RE</b> | OEZ:42311  | 0.5               | 0.057       | 1             |

<sup>1)</sup> Each digit indicates successively the number of make, break, auxiliary make-and-break and signal make-and-break contacts.

## ACCESSORIES



SV-LT-X400



SP-LT-A230

## Shunt trips

- Accessory to:
  - miniature circuit breakers: LTS, LTN, LTN-UC, LVN, LVN-DC
  - residual current circuit breakers: LFN, LFE
  - residual current circuit breakers with overcurrent protection: OLI, OLE (installation on OLI/OLE requires handle adapter OD-OL-NR01 see page B46)
  - switches: MSN.
- They are used for device switching off by applied voltage.
- Mounting:
  - on the right side of the device
  - one shunt trip can be connected to one device in combination with the other accessories - see page B54.

| Rated voltage<br>$U_c$          | Type              | Order code | Number of modules | Weight [kg] | Package [pcs] |
|---------------------------------|-------------------|------------|-------------------|-------------|---------------|
| AC/DC 24 ÷ 60 V.                | <b>SV-LT-X060</b> | OEZ:42312  | 1                 | 0.106       | 1             |
| AC 110 ÷ 415 V / DC 110 ÷ 220 V | <b>SV-LT-X400</b> | OEZ:42313  | 1                 | 0.098       | 1             |

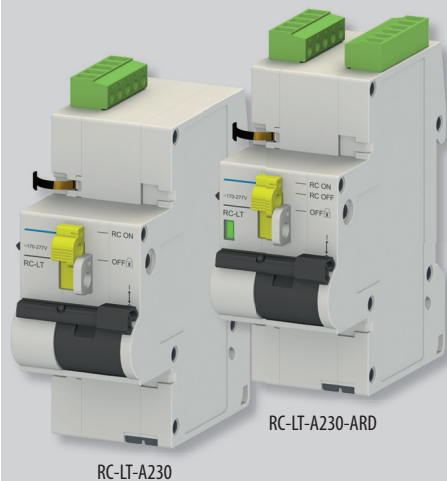
## Undervoltage releases

- Accessory to:
  - miniature circuit breakers: LTS, LTN, LTN-UC, LVN, LVN-DC
  - residual current circuit breakers: LFN, LFE
  - residual current circuit breakers with overcurrent protection: OLI, OLE (installation on OLI/OLE requires handle adapter OD-OL-NR01 see page B46)
  - switches: MSN.
- They are used for tripping the device at loss of voltage as well as at gradual decrease of voltage.
- They are used for elimination of closing of circuit breaker if voltage is lower than 35 %  $U_c$  (switching is possible at voltage higher than 85 %  $U_c$ ).
- They are often used for protection against device restart following mains failure.
- Mounting:
  - on the right side of the device
  - one undervoltage release can be connected to one device in combination with the other accessories - see page B54.

| Rated voltage<br>$U_c$ | Arrangement of contacts <sup>1)</sup> | Type                   | Order code | Number of modules | Weight [kg] | Package [pcs] |
|------------------------|---------------------------------------|------------------------|------------|-------------------|-------------|---------------|
| AC 230 V               | -                                     | <b>SP-LT-A230</b>      | OEZ:42315  | 1                 | 0.109       | 1             |
|                        | 20                                    | <b>SP-LT-A230-2000</b> | OEZ:42317  | 1                 | 0.123       | 1             |
| DC 24 V                | -                                     | <b>SP-LT-D024</b>      | OEZ:42319  | 1                 | 0.113       | 1             |
|                        | 20                                    | <b>SP-LT-D024-2000</b> | OEZ:42321  | 1                 | 0.117       | 1             |
| DC 110 V               | -                                     | <b>SP-LT-D110</b>      | OEZ:42320  | 1                 | 0.105       | 1             |
|                        | 20                                    | <b>SP-LT-D110-2000</b> | OEZ:42322  | 1                 | 0.128       | 1             |

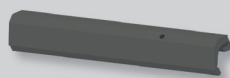
<sup>1)</sup> Each digit indicates successively the number of make and break contacts.

## ACCESSORIES



RC-LT-A230

RC-LT-A230-ARD



RC-LT-NR01



OD-OL-NR01



### Remote control

- Accessory to:
  - miniature circuit breakers: LTP, LTK, LTS, LTN, LTN-UC
  - residual current circuit breakers: LFE, LFN (only in combination with RC-LT-A230-ARD)
  - residual current circuit breakers with overcurrent protection: OLI, OLE
  - switches: MSO, MSN, AVN-DC.
- They are used for remote switching on/off the device.
- ARD (auto reclose device) function is used for automatic reclosing of the controlled device after switching off by release.
- It is necessary to use a suitable remote control adapter for mounting of a remote control.

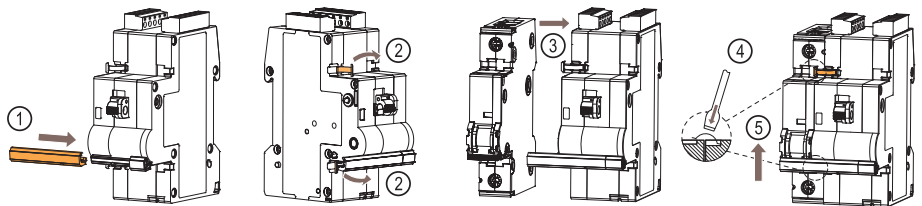
| Rated voltage<br>$U_c$ | Arrangement<br>of contacts <sup>1)</sup> | Type                  | Order<br>code | Number<br>of modules | Weight<br>[kg] | Package<br>[pcs] |
|------------------------|------------------------------------------|-----------------------|---------------|----------------------|----------------|------------------|
| AC 230 V               | -                                        | <b>RC-LT-A230</b>     | OEZ:46474     | 2                    | 0.229          | 1                |
|                        | 0011                                     | <b>RC-LT-A230-ARD</b> | OEZ:46478     | 2                    | 0.237          | 1                |

<sup>1)</sup> Each digit indicates successively the number of make, break, auxiliary make-and-break and signal make-and-break contacts.

### Remote control adapter

| Type              | Order<br>code | Description                                    | Weight<br>[kg] | Package<br>[ks] |
|-------------------|---------------|------------------------------------------------|----------------|-----------------|
| <b>RC-LT-NR01</b> | OEZ:46480     | for 1-pole and 2-pole LTK, LTN, LTN-UC and MSN | 0.013          | 5               |
| <b>RC-LT-NR02</b> | OEZ:46481     | for 3-pole and 4-pole LTK, LTN, MSN and AVN-DC | 0.011          | 5               |
| <b>RC-LT-NR03</b> | OEZ:46482     | for 2-pole OLE, OLI                            | 0.010          | 5               |
| <b>RC-LT-NR04</b> | OEZ:46483     | for 1-pole and 2-pole LFK, LFN and MSO         | 0.009          | 5               |
| <b>RC-LT-NR05</b> | OEZ:46484     | for 3-pole and 4-pole LTP, LTK, LTS and MSO    | 0.011          | 5               |

### Example of installation

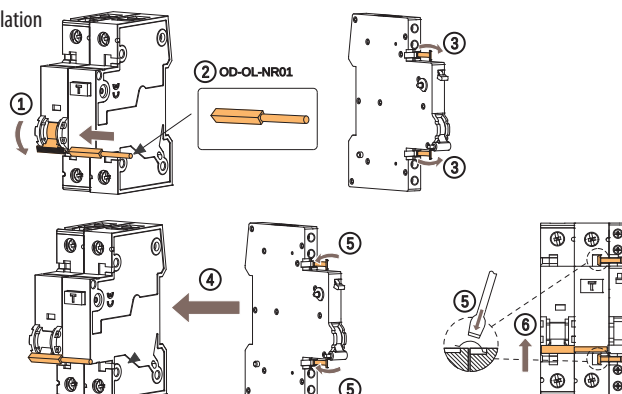


### Handle adapter OD-OL-NR01

- Accessory to: OLI, OLE.
- It enables installation of the following accessories on residual current circuit breakers with overcurrent protection OLI, OLE
  - auxiliary switches (PS-LT)
  - signal switches (SS-LT)
  - undervoltage releases (SP-LT)
  - shunt trips (SV-LT).
- Special auxiliary switch PS-LT-1100-K contains the handle adapter OD-OL-NR01. So it is not necessary to order it separately.

| Type              | Order<br>code | Weight<br>[kg] | Package<br>[pcs] |
|-------------------|---------------|----------------|------------------|
| <b>OD-OL-NR01</b> | OEZ:38270     | 0.002          | 5                |

### Example of installation



## ACCESSORIES



OD-LT-VU01



OD-LT-VU02



OD-LT-VP01

**Locking insert OD-LT-VU01**

- Accessory to:
  - miniature circuit breakers: LTK, LTN, LTN-UC, LVN, LVN-DC
  - residual current circuit breakers: OLI, OLE
  - switches: MSN, AVN-DC.
- For safe locking of the control lever in off or on position.
- The protective function of the devices is functional even in locked position.
- Maximum diameter of lock rod - 3 mm.
- The lock is not included in the package.

| Type              | Order code | Weight [kg] | Package [pcs] |
|-------------------|------------|-------------|---------------|
| <b>OD-LT-VU01</b> | OEZ:42324  | 0.012       | 1             |

**Locking insert OD-LT-VU02**

- Accessory to:
  - miniature circuit breakers: LTP, LTS
  - residual current circuit breakers: LFN, LFE
  - switches: MSO.
- For safe locking of the control lever in off or on position.
- The protective function of the devices is functional even in locked position.
- Maximum diameter of lock rod - 6 mm.
- The lock is not included in the package.
- **In installation it is necessary to press the fixing springs of the insert by two fingers against each other, and then slide them in the holes in the circuit breaker. In case of pressing the insert against the circuit breaker body a part of the plastic cover could break off!**

| Type              | Order code | Weight [kg] | Package [pcs] |
|-------------------|------------|-------------|---------------|
| <b>OD-LT-VU02</b> | OEZ:42325  | 0.003       | 1             |

**Sealing insert OD-LT-VP01**

- Accessory to:
  - miniature circuit breakers: LTP, LTS, LTN, LTN-UC, LVN, LVN-DC
  - residual current circuit breakers with overcurrent protection: OLI, OLE
  - switches: MSO, MSN, AVN-DC.
- For covering and sealing of terminal screws.

| Type              | Order code | Weight [kg] | Package [pcs] |
|-------------------|------------|-------------|---------------|
| <b>OD-LT-VP01</b> | OEZ:42323  | 0.002       | 1             |

## ACCESSORIES

## Specifications of auxiliary and signal switches

| Type                                                 |                                |       |            | PS-LT<br>SS-LT                                                                    | PS-LT-1100-MN<br>PS-LT-1100-MN-TE                                                   |
|------------------------------------------------------|--------------------------------|-------|------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Standards                                            |                                |       |            | EN 60947-5-1<br>EN 62019                                                          | EN 60947-5-1<br>EN 62019                                                            |
| Approval marks                                       |                                |       |            |  |  |
| Arrangement of contacts <sup>1)</sup>                |                                |       |            | 1100, 2000, 0200, 0010, 0011                                                      | 1100, 2000, 0200                                                                    |
| Rated operating voltage/current                      | U <sub>e</sub> /I <sub>e</sub> | AC-13 | 400 V      | 2 A                                                                               | -                                                                                   |
|                                                      |                                |       | 230 V      | 6 A                                                                               | -                                                                                   |
|                                                      |                                | AC-14 | 400 V      | 2 A                                                                               | -                                                                                   |
|                                                      |                                |       | 230 V      | 6 A                                                                               | -                                                                                   |
|                                                      | DC-13 <sup>2)</sup>            | 220 V | 1 A/0.5 A  | -                                                                                 |                                                                                     |
|                                                      |                                | 110 V | 1 A/0.75 A | -                                                                                 |                                                                                     |
|                                                      |                                | 60 V  | 3 A/1.5 A  | -                                                                                 |                                                                                     |
|                                                      |                                | 24 V  | 6 A/3 A    | -                                                                                 |                                                                                     |
| Max. voltage/current                                 |                                |       |            | -                                                                                 | DC 30 V / 100 mA                                                                    |
| Min. voltage/current                                 |                                |       |            | AC/DC 24 V / 50 mA                                                                | DC 5 V / 1 mA                                                                       |
| Backup protection - fuse / miniature circuit breaker |                                |       |            | 6 A gG / 6 A characteristic B, C                                                  | 6 A gG / 6 A characteristic B, C                                                    |
| Mechanical endurance                                 |                                |       |            | 10 000 operating cycles                                                           | 10 000 operating cycles                                                             |
| Electrical endurance at I <sub>e</sub>               |                                |       |            | 10 000 operating cycles                                                           | 10 000 operating cycles                                                             |
| Degree of protection                                 |                                |       |            | IP20                                                                              | IP20                                                                                |
| Connection                                           |                                |       |            |                                                                                   |                                                                                     |
| Cu conductor - rigid (solid, stranded)               |                                |       |            | 0.5 ÷ 2.5 mm <sup>2</sup>                                                         | 0.5 ÷ 2.5 mm <sup>2</sup>                                                           |
| Cu conductor - flexible                              |                                |       |            | 0.5 ÷ 2.5 mm <sup>2</sup>                                                         | 0.5 ÷ 2.5 mm <sup>2</sup>                                                           |
| Torque                                               |                                |       |            | 0.5 Nm                                                                            | 0.5 Nm                                                                              |
| Top or bottom connection                             |                                |       |            | top/bottom                                                                        | top/bottom                                                                          |
| Operating conditions                                 |                                |       |            |                                                                                   |                                                                                     |
| Ambient temperature                                  |                                |       |            | -25 ÷ +55 °C                                                                      | -25 ÷ +55 °C                                                                        |
| Working position                                     |                                |       |            | arbitrary                                                                         | arbitrary                                                                           |
| Climatic resistance according to IEC 60068-2-30      |                                |       |            | 28 operating cycles                                                               | 28 operating cycles                                                                 |
| Shocks (EN 60068-2-27)                               |                                |       |            | 150 m/s <sup>2</sup> in 11 ms half-sine pulse                                     | 150 m/s <sup>2</sup> in 11 ms half-sine pulse                                       |
| Vibration resistance according to IEC 60068-2-6      |                                |       |            | 50 m/s <sup>2</sup> at 10 ÷ 150 Hz                                                | 50 m/s <sup>2</sup> at 10 ÷ 150 Hz                                                  |

<sup>1)</sup> Each digit indicates successively the number of make, break, auxiliary make-and-break and signal make-and-break contacts.

<sup>2)</sup> Value according to EN 62019 / according to EN 60947-5-1

## Function of signal switch SS-LT

| Circuit breaker contact state            | The state of the MAKE signal contact SS-LT-... * |
|------------------------------------------|--------------------------------------------------|
| Initial position - contacts open         | switched off                                     |
| Switching on manually - contacts closed  | switched on                                      |
| Switching off manually - contacts open   | switched on                                      |
| Switching off by release - contacts open | switched off                                     |

\* The break contact works in opposite way.

## ACCESSORIES

### Specifications of shunt trips and undervoltage releases

| Type                                                     | SV-LT                                                                                                                                                               | SP-LT                                                                                                                                                                   |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Standards                                                | EN 60947-1                                                                                                                                                          | EN 60947-1                                                                                                                                                              |
| Approval marks                                           |   |   |
| Mounting                                                 | on the right side of the device                                                                                                                                     | on the right side of the device                                                                                                                                         |
| Degree of protection                                     | IP20                                                                                                                                                                | IP20                                                                                                                                                                    |
| Control circuit coil                                     |                                                                                                                                                                     |                                                                                                                                                                         |
| Rated voltage                                            | $U_c$                                                                                                                                                               |                                                                                                                                                                         |
|                                                          | AC/DC 24 ÷ 60 V                                                                                                                                                     | AC 230 V                                                                                                                                                                |
|                                                          | AC 110 ÷ 415 V / DC 110 ÷ 220 V                                                                                                                                     | DC 24, 110 V                                                                                                                                                            |
| Range of rated voltage                                   | $0.7 \div 1.1 U_c$                                                                                                                                                  | $0.85 \div 1.1 U_c$                                                                                                                                                     |
| Voltage range for switching off                          | -                                                                                                                                                                   | $< 0.35 \div 0.7 U_c$                                                                                                                                                   |
| Rated frequency                                          | $f_n$                                                                                                                                                               |                                                                                                                                                                         |
|                                                          | 50/60 Hz                                                                                                                                                            | 50/60 Hz                                                                                                                                                                |
| Backup protection - fuse / miniature circuit breaker     | 6 A gG / 6 A characteristic B, C                                                                                                                                    | 6 A gG / 6 A characteristic B, C                                                                                                                                        |
| The length of impulse necessary for device switching off | 15 ms                                                                                                                                                               | -                                                                                                                                                                       |
| Power loss                                               | P                                                                                                                                                                   |                                                                                                                                                                         |
|                                                          | AC 230 V                                                                                                                                                            | 5 VA                                                                                                                                                                    |
|                                                          | DC 24 V                                                                                                                                                             | 1.4 W                                                                                                                                                                   |
|                                                          | DC 110 V                                                                                                                                                            | 1.8 W                                                                                                                                                                   |
| Contact                                                  |                                                                                                                                                                     |                                                                                                                                                                         |
| Arrangement of contacts <sup>1)</sup>                    | -                                                                                                                                                                   | 20                                                                                                                                                                      |
| Min. voltage/current                                     | -                                                                                                                                                                   | 24 V / 50 mA                                                                                                                                                            |
| Backup protection - fuse / miniature circuit breaker     | -                                                                                                                                                                   | 6 A gG / 6 A characteristic B, C                                                                                                                                        |
| Connection                                               |                                                                                                                                                                     |                                                                                                                                                                         |
| Cu conductor - rigid (solid, stranded)                   | $0.5 \div 2.5 \text{ mm}^2$                                                                                                                                         | $0.5 \div 2.5 \text{ mm}^2$                                                                                                                                             |
| Cu conductor - flexible                                  | $0.5 \div 2.5 \text{ mm}^2$                                                                                                                                         | $0.5 \div 2.5 \text{ mm}^2$                                                                                                                                             |
| Torque                                                   | 0.8 Nm                                                                                                                                                              | 0.8 Nm                                                                                                                                                                  |
| Top or bottom connection                                 | top/bottom                                                                                                                                                          | top/bottom                                                                                                                                                              |
| Operating conditions                                     |                                                                                                                                                                     |                                                                                                                                                                         |
| Mechanical endurance                                     | 10 000 operating cycles                                                                                                                                             | 10 000 operating cycles                                                                                                                                                 |
| Electrical endurance                                     | 2 000 operating cycles                                                                                                                                              | 2 000 operating cycles                                                                                                                                                  |
| Ambient temperature                                      | -25 ÷ +55 °C                                                                                                                                                        | -25 ÷ +55 °C                                                                                                                                                            |
| Working position                                         | arbitrary                                                                                                                                                           | arbitrary                                                                                                                                                               |
| Climatic resistance according to IEC 60068-2-30          | 28 operating cycles                                                                                                                                                 | 28 operating cycles                                                                                                                                                     |
| Shocks (EN 60068-2-27)                                   | 50 m/s <sup>2</sup> in 11 ms half-sine pulse                                                                                                                        | 50 m/s <sup>2</sup> in 11 ms half-sine pulse                                                                                                                            |
| Vibration resistance according to IEC 60068-2-6          | 50 m/s <sup>2</sup> at 10 ÷ 150 Hz                                                                                                                                  | 50 m/s <sup>2</sup> at 10 ÷ 150 Hz                                                                                                                                      |

<sup>1)</sup> Each digit indicates successively the number of make and break contacts.

## ACCESSORIES

### Specifications of remote controls

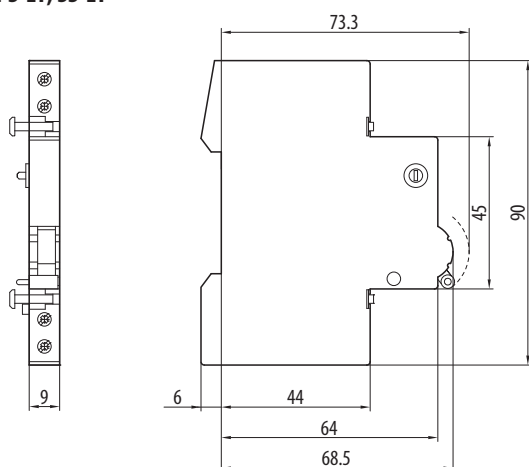
| Type                                                   |       | RC-LT-A230                      | RC-LT-A230-ARD                  |
|--------------------------------------------------------|-------|---------------------------------|---------------------------------|
| Standards                                              |       | EN 50557                        | EN 50557                        |
| Approval marks                                         |       | <b>CE</b>                       | <b>CE</b>                       |
| Mounting                                               |       | on the right side of the device | on the right side of the device |
| Degree of protection                                   |       | IP20                            | IP20                            |
| Rated voltage                                          | $U_c$ | AC 230 V                        | AC 230 V                        |
| Range of rated voltage                                 |       | AC 177 ÷ 270 V                  | AC 177 ÷ 270 V                  |
| Rated frequency                                        | $f_n$ | 50/60 Hz                        | 50/60 Hz                        |
| Max. length of remote control conductors               |       | 1 500 m                         | 1 500 m                         |
| Power loss                                             | P     | AC 230 V<br>1 VA                | -                               |
| ARD - auto reclose device                              |       |                                 |                                 |
| Number of attempts                                     |       | 0                               | 3                               |
| Time after which automatic reclosing will be executed. |       | -                               | 10 s, 1 min, 10 min             |
| Contact                                                |       |                                 |                                 |
| Arrangement of contacts <sup>1)</sup>                  |       | -                               | 0011                            |
| Rated operating voltage/current                        |       | -                               | AC 250 V / 2 A                  |
| Connection                                             |       |                                 |                                 |
| Cu conductor - rigid (solid, stranded)                 |       | 0.5 ÷ 1.5 mm <sup>2</sup>       | 0.5 ÷ 1.5 mm <sup>2</sup>       |
| Cu conductor - flexible                                |       | 0.5 ÷ 1.5 mm <sup>2</sup>       | 0.5 ÷ 1.5 mm <sup>2</sup>       |
| Torque                                                 |       | 0.25 Nm                         | 0.25 Nm                         |
| Operating conditions                                   |       |                                 |                                 |
| Mechanical endurance                                   |       | 10 000 operating cycles         | 10 000 operating cycles         |
| Electrical endurance                                   |       | 10 000 operating cycles         | 10 000 operating cycles         |
| Ambient temperature                                    |       | -25 ÷ 45 °C                     | -25 ÷ 45 °C                     |

<sup>1)</sup> Each digit indicates successively the number of make, break, auxiliary make-and-break and signal make-and-break contacts.

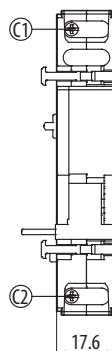
## ACCESSORIES

### Dimensions

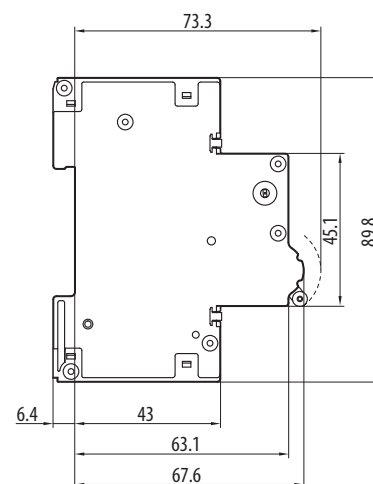
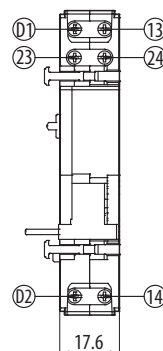
#### PS-LT, SS-LT



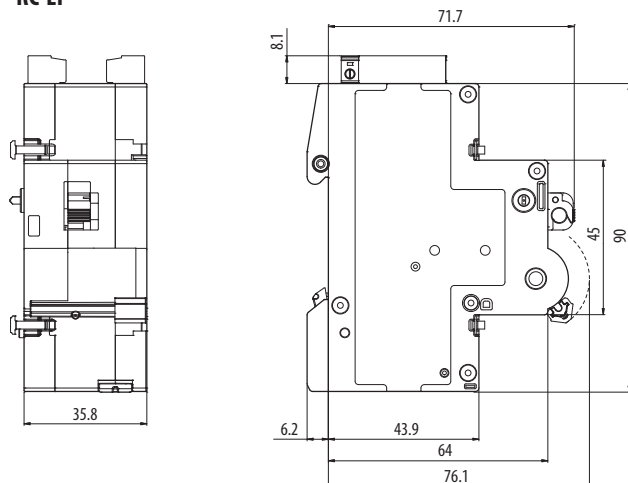
#### SV-LT



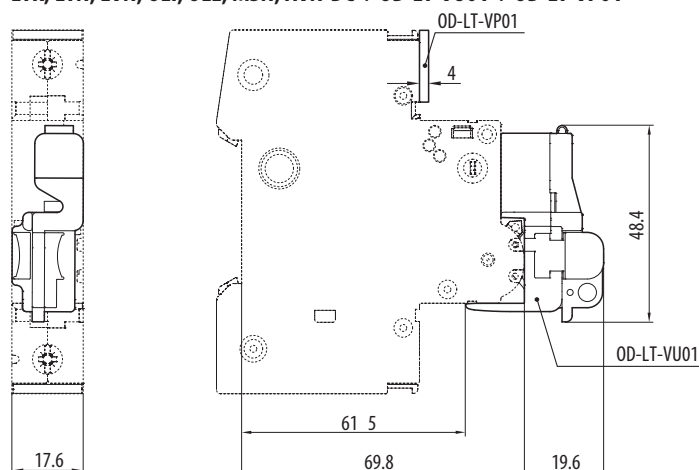
#### SP-LT



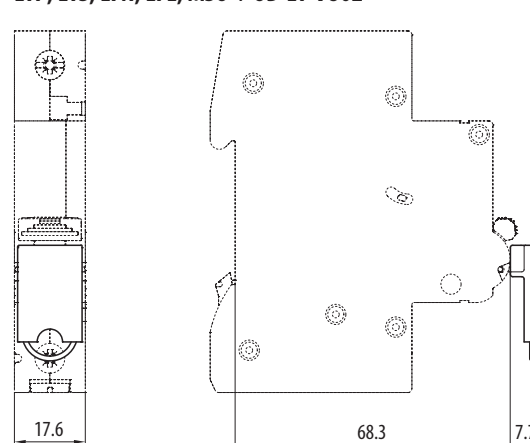
#### RC-LT



#### LTK, LTN, LVN, OLI, OLE, MSN, AVN-DC + OD-LT-VU01 + OD-LT-VP01



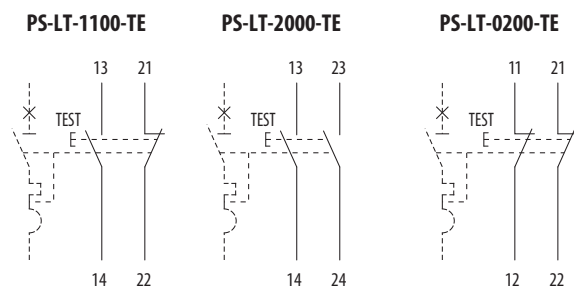
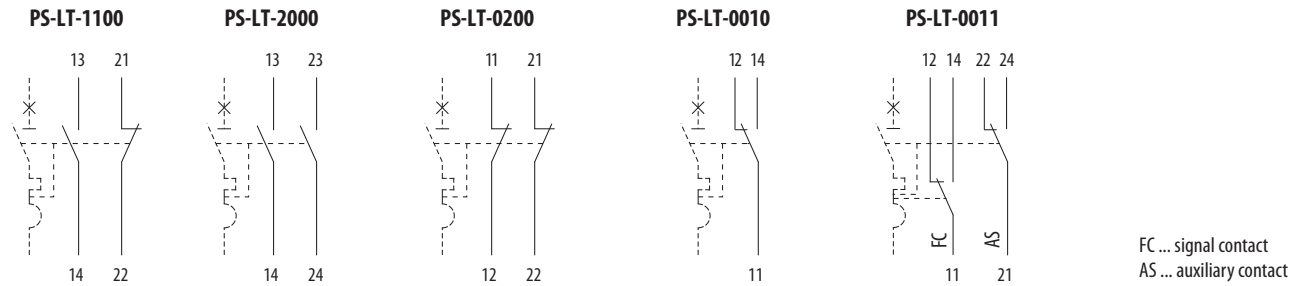
#### LTP, LTS, LFN, LFE, MSO + OD-LT-VU02



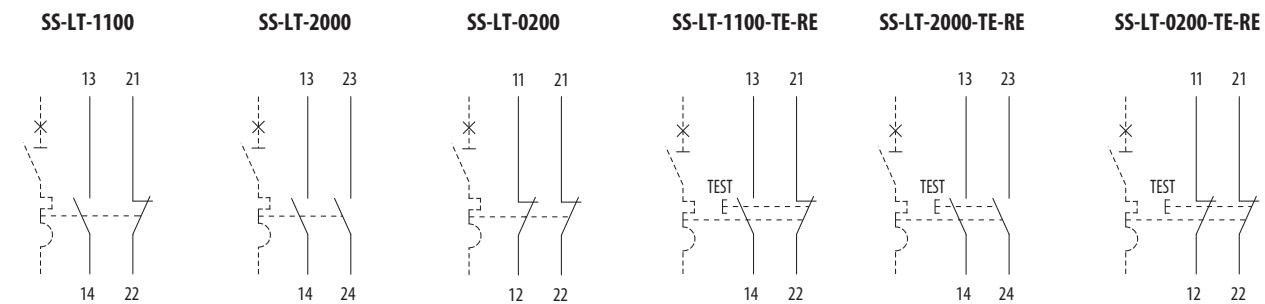
## ACCESSORIES

### Diagram

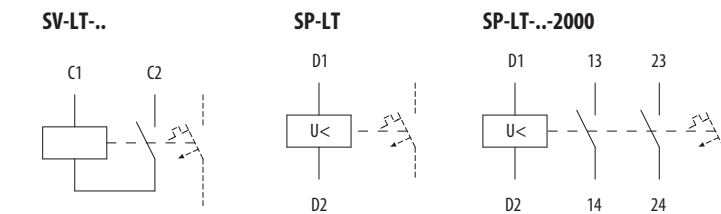
#### Auxiliary switches



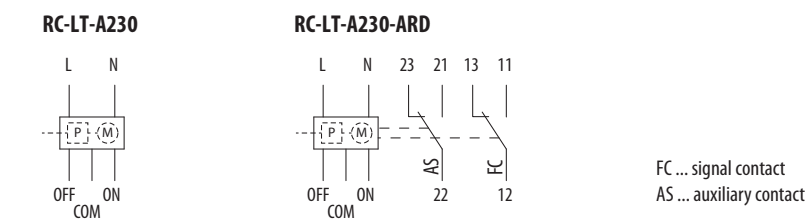
#### Signal switches



#### Shunt trips and undervoltage releases



#### Remote control

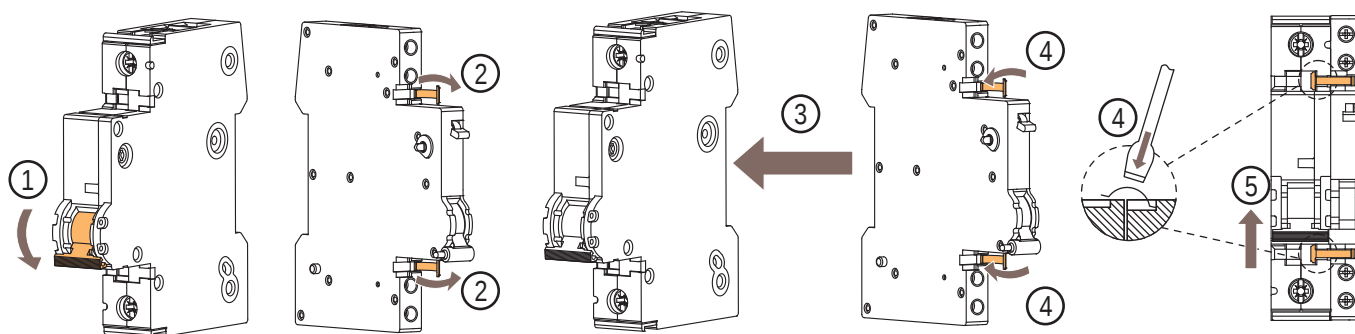


## ACCESSORIES

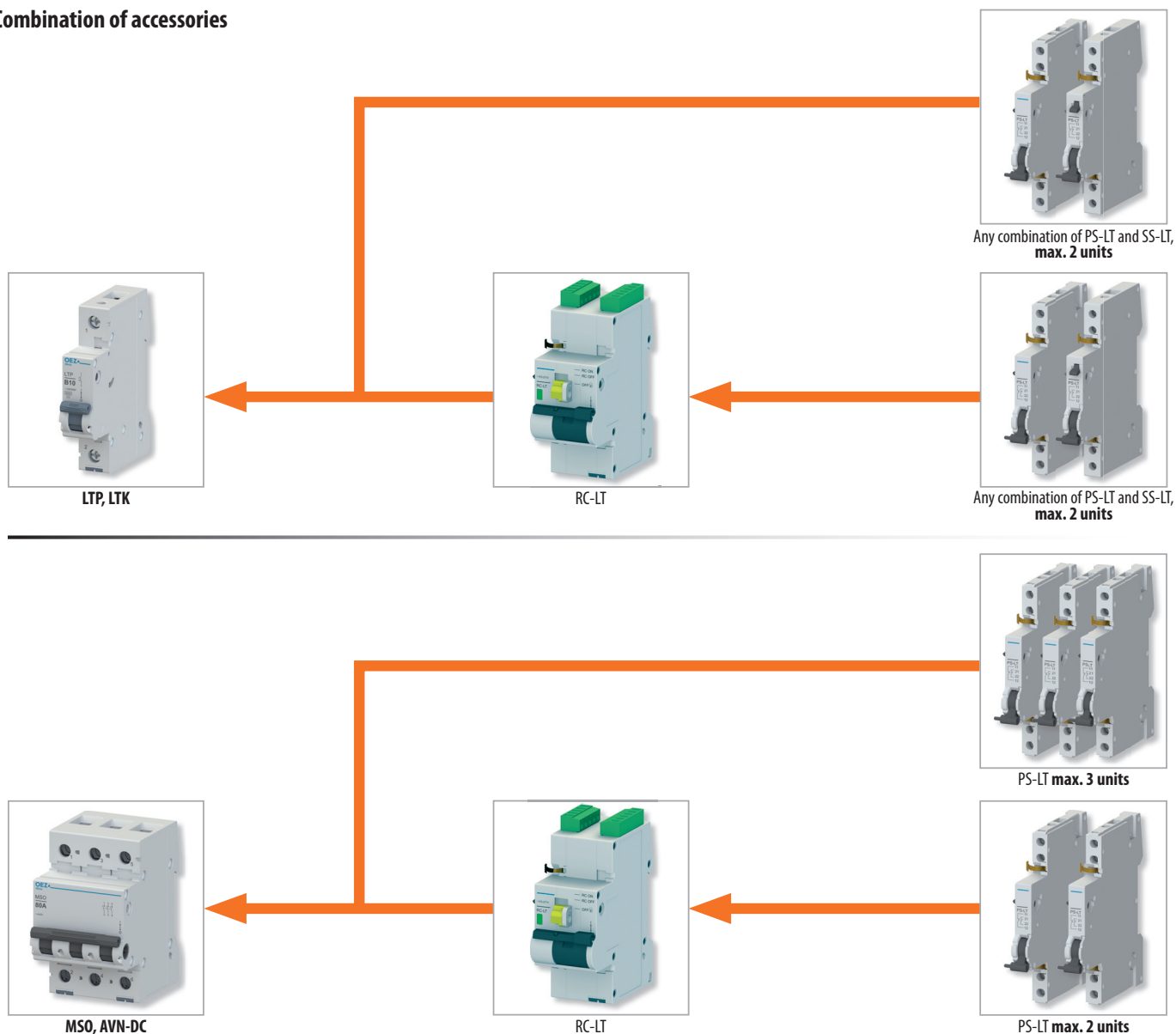
### Installation of auxiliary switch, shunt trips or undervoltage releases

For installation of an auxiliary switch, shunt trip or undervoltage releases on a circuit breaker, residual current circuit breaker or switch, the same procedure shall apply as described on the example of installation of the auxiliary switch on the circuit breaker in the following points.

1. In mounting the levers of auxiliary switch and of the circuit breaker are in OFF position.
2. Tilt both fixing springs of the auxiliary switch to the right so that they do not get between the auxiliary switch and circuit breaker in installation.
3. Slide the auxiliary switch onto the circuit breaker from the right.
4. Lock the fixing springs in the circuit breaker body so that the auxiliary switch cannot release.
5. Check correct function by switching.

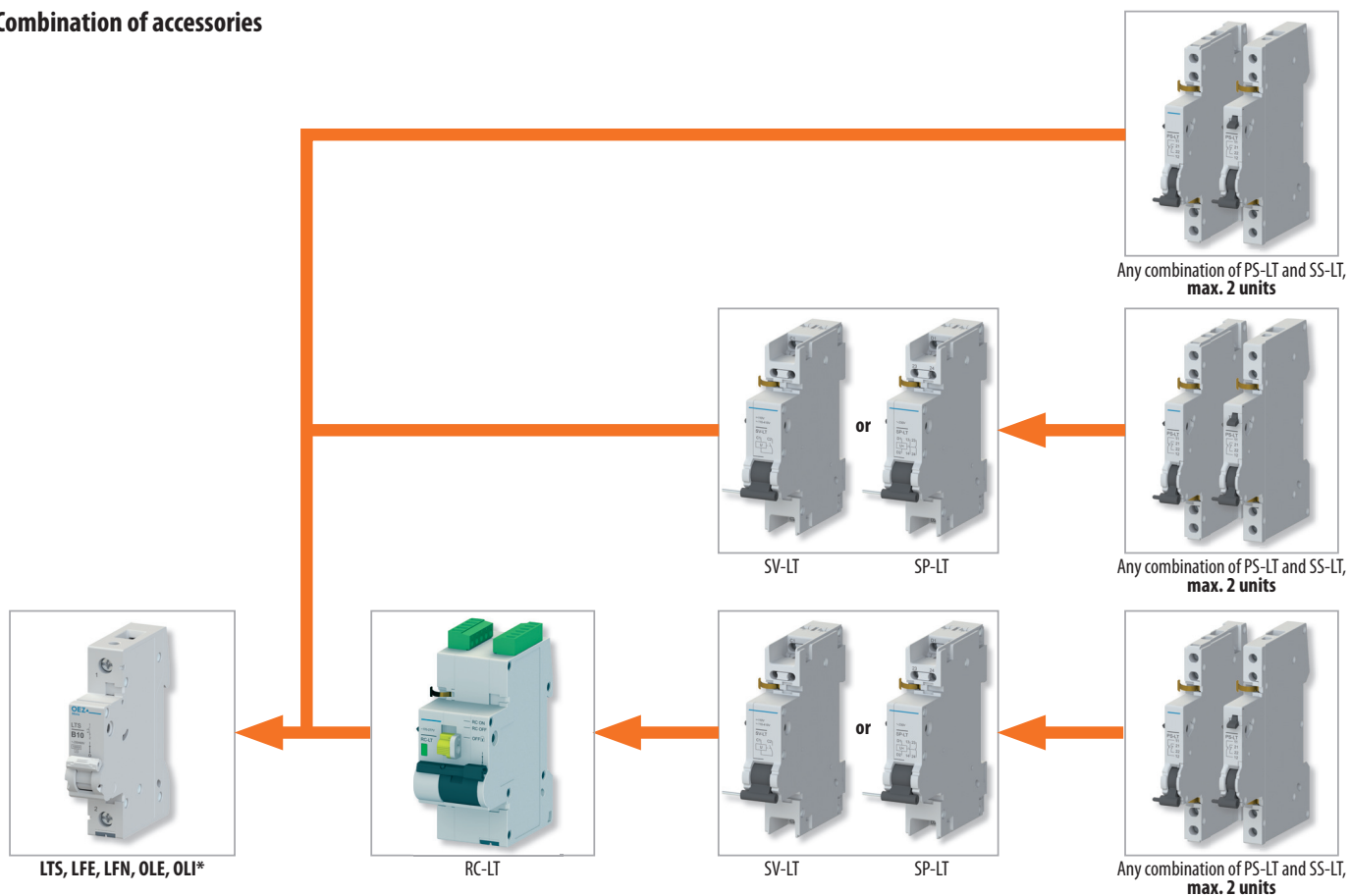


### Combination of accessories

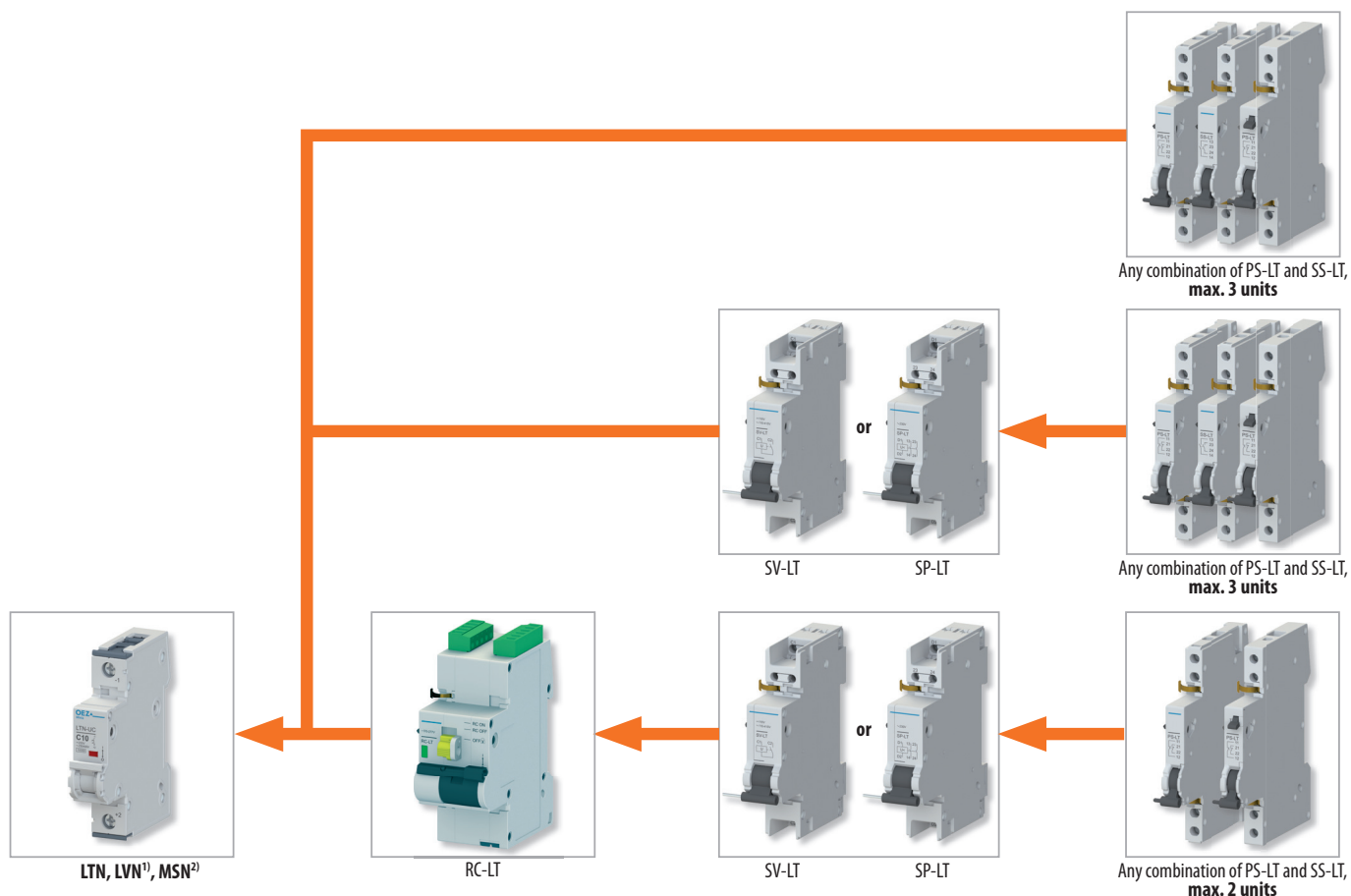


## ACCESSORIES

### Combination of accessories



\* Installation of accessories on OLE/OLI requires handle adapter OD-OL-NR01, see page B35.



<sup>1)</sup> Remote control RC-LT cannot be combined with miniature circuit breaker LVN.

<sup>2)</sup> Installation of signal switches SS-LT on the MSN, switch, only with SP-LT or SV-LT.



► **OEZ s.r.o.**  
Šedivská 339  
561 51 Letohrad  
Czech Republic  
tel.: +420 465 672 111  
+420 465 672 101  
fax: +420 465 672 398  
+420 465 672 151  
e-mail: [oeztrade.cz@oez.com](mailto:oeztrade.cz@oez.com)  
[www.oez.com](http://www.oez.com)



Any changes reserved

