

# Surge Protection Devices Ex9UE2



- Surge Protection Devices
- Type 2 (Class II, T2, C)
- Tested according to EN 61643-11
- Nominal discharge current  $I_n$  20 kA (8/20  $\mu$ s) per module and 40 kA for NPE module
- Maximum continuous operational voltage  $U_c$  from 275 V up to 440 V AC
- Versions with 1+0, 1+1, 2+0, 3+0, 3+1 and 4+0 connection
- Plug-in module design
- With and without remote indication contact
- Device status indicator

The Ex9UE2 line is a group of Class II Surge Protective Devices. They are intended as a protection against transient overvoltage caused by fast switching operations or indirect hits of lightning strokes (residuum effects).

It is recommended to install Class II SPDs every 10 – 20 meters of cable length repetitively, typically to main and sub distribution boards. The Ex9UE2 20 440 are designed for direct coordination with Class I SPDs of line Ex9UE1 35. In case of Ex9UE2 20 275, the coordination with the line Ex9UE1 35 is done by means of 10 m cable length.

The design of Ex9UE2 is based on Metal Oxide Varistors. Such design provides very low response time. The modular design with plug in inserts allows simple and quick replacement of function modules in case of MOV is beyond if its lifespan due to often occurrence of overvoltage peaks.

## Type Key

| Ex9            | UE                                 | 1+2                              | 12.5  | R                 | 1P   | 275  |  |
|----------------|------------------------------------|----------------------------------|---|-------------------|--|--|--|
| Product family | Product                            | Class                            | Current   | Signaling contact | Type of connection   | Max. oper. voltage                                     | Plug-in module                               |
| Ex9            | UE:<br>AC Surge Protective Devices | 2: type 2<br>class II<br>C<br>T2 | $I_n$ (8/20 $\mu$ s)<br>20 kA (L-N)<br>40 kA (N-PE) | R: Yes<br>_: No   | 1P: 1+0<br>2P: 2+0<br>3P: 3+0<br>4P: 4+0<br>1PN: 1+1<br>3PN: 3+1<br>NPE: 0+1 | 275 V AC<br>320 V AC<br>385 V AC<br>440 V AC<br>_: NPE | _: Complete device<br>M: Plug-in module only |

## Certification marks



# Surge Protection Devices Ex9UE2

## Type 2 SPD (Class II, T2, C) complete devices, $I_n = 20 \text{ kA (8/20 } \mu\text{s)}$

- Nominal discharge current  $I_n$  20 kA (8/20  $\mu\text{s}$ ) per module and 40 kA (8/20  $\mu\text{s}$ ) for NPE (+1) module
- Maximum discharge current  $I_{\text{max}}$  40 kA (8/20  $\mu\text{s}$ )



| Max. oper. voltage $U_c$ | Connection | Signaling contact | Article No. | Type               | Packing |
|--------------------------|------------|-------------------|-------------|--------------------|---------|
| 275 V AC                 | 1+0        | no                | 103347      | Ex9UE2 20 1P 275   | 1/96    |
| 275 V AC                 | 1+0        | yes               | 103348      | Ex9UE2 20R 1P 275  | 1/96    |
| 275 V AC                 | 1+1        | no                | 103349      | Ex9UE2 20 1PN 275  | 1/60    |
| 275 V AC                 | 1+1        | yes               | 103350      | Ex9UE2 20R 1PN 275 | 1/60    |
| 275 V AC                 | 2+0        | no                | 103351      | Ex9UE2 20 2P 275   | 1/60    |
| 275 V AC                 | 2+0        | yes               | 103352      | Ex9UE2 20R 2P 275  | 1/60    |
| 275 V AC                 | 3+0        | no                | 103353      | Ex9UE2 20 3P 275   | 1/54    |
| 275 V AC                 | 3+0        | yes               | 103354      | Ex9UE2 20R 3P 275  | 1/54    |
| 275 V AC                 | 3+1        | no                | 103355      | Ex9UE2 20 3PN 275  | 1/45    |
| 275 V AC                 | 3+1        | yes               | 103356      | Ex9UE2 20R 3PN 275 | 1/45    |
| 275 V AC                 | 4+0        | no                | 103357      | Ex9UE2 20 4P 275   | 1/45    |
| 275 V AC                 | 4+0        | yes               | 103358      | Ex9UE2 20R 4P 275  | 1/45    |
| 320 V AC                 | 1+0        | no                | 103754      | Ex9UE2 20 1P 320   | 1/96    |
| 320 V AC                 | 1+0        | yes               | 103755      | Ex9UE2 20R 1P 320  | 1/96    |
| 320 V AC                 | 1+1        | no                | 103756      | Ex9UE2 20 1PN 320  | 1/60    |
| 320 V AC                 | 1+1        | yes               | 103757      | Ex9UE2 20R 1PN 320 | 1/60    |
| 320 V AC                 | 2+0        | no                | 103758      | Ex9UE2 20 2P 320   | 1/60    |
| 320 V AC                 | 2+0        | yes               | 103759      | Ex9UE2 20R 2P 320  | 1/60    |
| 320 V AC                 | 3+0        | no                | 103760      | Ex9UE2 20 3P 320   | 1/54    |
| 320 V AC                 | 3+0        | yes               | 103761      | Ex9UE2 20R 3P 320  | 1/54    |
| 320 V AC                 | 3+1        | no                | 103762      | Ex9UE2 20 3PN 320  | 1/45    |
| 320 V AC                 | 3+1        | yes               | 103763      | Ex9UE2 20R 3PN 320 | 1/45    |
| 320 V AC                 | 4+0        | no                | 103764      | Ex9UE2 20 4P 320   | 1/45    |
| 320 V AC                 | 4+0        | yes               | 103765      | Ex9UE2 20R 4P 320  | 1/45    |
| 385 V AC                 | 1+0        | no                | 103766      | Ex9UE2 20 1P 385   | 1/96    |
| 385 V AC                 | 1+0        | yes               | 103767      | Ex9UE2 20R 1P 385  | 1/96    |
| 385 V AC                 | 1+1        | no                | 103768      | Ex9UE2 20 1PN 385  | 1/60    |
| 385 V AC                 | 1+1        | yes               | 103769      | Ex9UE2 20R 1PN 385 | 1/60    |
| 385 V AC                 | 2+0        | no                | 103770      | Ex9UE2 20 2P 385   | 1/60    |
| 385 V AC                 | 2+0        | yes               | 103771      | Ex9UE2 20R 2P 385  | 1/60    |
| 385 V AC                 | 3+0        | no                | 103772      | Ex9UE2 20 3P 385   | 1/54    |
| 385 V AC                 | 3+0        | yes               | 103773      | Ex9UE2 20R 3P 385  | 1/54    |
| 385 V AC                 | 3+1        | no                | 103774      | Ex9UE2 20 3PN 385  | 1/45    |
| 385 V AC                 | 3+1        | yes               | 103775      | Ex9UE2 20R 3PN 385 | 1/45    |
| 385 V AC                 | 4+0        | no                | 103776      | Ex9UE2 20 4P 385   | 1/45    |
| 385 V AC                 | 4+0        | yes               | 103777      | Ex9UE2 20R 4P 385  | 1/45    |
| 440 V AC                 | 1+0        | no                | 103359      | Ex9UE2 20 1P 440   | 1/96    |
| 440 V AC                 | 1+0        | yes               | 103360      | Ex9UE2 20R 1P 440  | 1/96    |
| 440 V AC                 | 1+1        | no                | 103361      | Ex9UE2 20 1PN 440  | 1/60    |
| 440 V AC                 | 1+1        | yes               | 103362      | Ex9UE2 20R 1PN 440 | 1/60    |
| 440 V AC                 | 2+0        | no                | 103363      | Ex9UE2 20 2P 440   | 1/60    |
| 440 V AC                 | 2+0        | yes               | 103364      | Ex9UE2 20R 2P 440  | 1/60    |
| 440 V AC                 | 3+0        | no                | 103365      | Ex9UE2 20 3P 440   | 1/54    |
| 440 V AC                 | 3+0        | yes               | 103366      | Ex9UE2 20R 3P 440  | 1/54    |
| 440 V AC                 | 3+1        | no                | 103367      | Ex9UE2 20 3PN 440  | 1/45    |
| 440 V AC                 | 3+1        | yes               | 103368      | Ex9UE2 20R 3PN 440 | 1/45    |
| 440 V AC                 | 4+0        | no                | 103369      | Ex9UE2 20 4P 440   | 1/45    |
| 440 V AC                 | 4+0        | yes               | 103370      | Ex9UE2 20R 4P 440  | 1/45    |

## Type 2 SPD spare modules, $I_n = 20 \text{ kA (8/20 } \mu\text{s)}$



| Max. oper. voltage $U_c$ | Nominal current $I_n$ | Article No. | Type               |
|--------------------------|-----------------------|-------------|--------------------|
| 275 V AC                 | 20 kA                 | 103344      | Ex9UE2 20 1P 275 M |
| 320 V AC                 | 20 kA                 | 103752      | Ex9UE2 20 1P 320 M |
| 385 V AC                 | 20 kA                 | 103753      | Ex9UE2 20 1P 385 M |
| 440 V AC                 | 20 kA                 | 103345      | Ex9UE2 20 1P 440 M |
| N-PE                     | 40 kA                 | 103346      | Ex9UE2 40 NPE M    |

# Technical Data Ex9UE2

## Surge Protection Devices Type 2, $I_n = 20 \text{ kA}$ (8/20 $\mu\text{s}$ )

### General parameters

|   |
|---|
| Suitable for protection of electrical installations against transient overvoltage |
| Plug-in module design   |
| Indication window helps users to know the status of device                        |
| Optional remote-signaling contact   |

### Electrical parameters

|  | 1+0, 2+0, 3+0, 4+0, 1+1, 3+1<br>(L-N/PE/PEN connection) |           |           |           | 1+1, 3+1<br>(x+1 N-PE connection) |
|--|---|-----------|-----------|-----------|-----------------------------------|
| Tested according to                                    | EN 61643-11   |           |           |           |                                   |
| Classified type (test class)                           | Type 2 (Class II, C, T2)                                |           |           |           |                                   |
| Technology   | MOV (Varistor)  |           |           |           | GDT (Spark-gap)                   |
| Rated operational voltage $U_n$                        | 230 / 400 V AC  |           |           |           |                                   |
| Reference test voltage $U_{REF}$                       | 255 V AC  |           |           |           |                                   |
| Max. continuous operational voltage $U_c$              | 275 V AC  | 320 V AC  | 385 V AC  | 440 V AC  | 255 V AC                          |
| Nominal frequency $f$                                  | 50/60 Hz  |           |           |           |                                   |
| Nominal discharge current $I_n$ (8/20 $\mu\text{s}$ )  | 20 kA per pole  |           |           |           | 40 kA per pole                    |
| Max. impulse current $I_{imp}$ (10/350 $\mu\text{s}$ ) | -   |           |           |           | 12 kA per pole                    |
| Max. discharge current $I_{max}$ (8/20 $\mu\text{s}$ ) | 40 kA per pole  |           |           |           |                                   |
| Protection voltage $U_p$ at $I_n$                      | 1.4 kV  | 1.6 kV    | 1.9 kV    | 2.2 kV    | 1.5 kV                            |
| Protection voltage $U_p$ at $I_{max}$                  | 2 kV  | 2.3 kV    | 2.5 kV    | 2.8 kV    | 1.5 kV                            |
| Protection voltage $U_p$ at 5 kA (8/20 $\mu\text{s}$ ) | 1 kV  | 1.15 kV   | 1.3 kV    | 1.5 kV    | -                                 |
| N-PE follow current interrupting rating $I_{fi}$       | -   |           |           |           | 100 A                             |
| Temporary overvoltage $U_t$ (withstand)                | 335 V   | 405 V     | 490 V     | 580 V     | 1200 V                            |
| Residual current $I_{PE}$ at $U_{REF}$                 | $\leq 1 \text{ mA}$                                     |           |           |           | -                                 |
| MOV voltage of 1mA point                               | 387-473 V   | 460-561 V | 554-677 V | 639-781 V | -                                 |
| Response time  | $\leq 25 \text{ ns}$                                    |           |           |           | $\leq 100 \text{ ns}$             |
| Max. back-up fuse                                      | max. 125 A gG   |           |           |           | -                                 |
| Short-circuit withstand capability                     | 50 kA   |           |           |           | -                                 |
| Short-circuit current rating $I_{SCCR}$                | 10 kA   |           |           |           | -                                 |
| Current factor $k$                                     | 1.6   |           |           |           | -                                 |
| Number of ports  | 1   |           |           |           |                                   |
| Type of LV system                                      | TN-C, TN-S, TN-C-S, TT (1+1, 3+1), IT (1+1, 3+1)        |           |           |           |                                   |
| Remote contact (optional)                              | 1 changeover (CO)                                       |           |           |           |                                   |
| Remote contact op. voltage / current                   |   |           |           |           |                                   |
| AC $U_{max} / I_{max}$                                 | 250 V AC / 1 A  |           |           |           |                                   |
| DC $U_{max} / I_{max}$                                 | 30 V DC / 1 A   |           |           |           |                                   |

# Technical Data Ex9UE2

## Surge Protection Devices Type 2, $I_n = 20 \text{ kA} (8/20 \mu\text{s})$

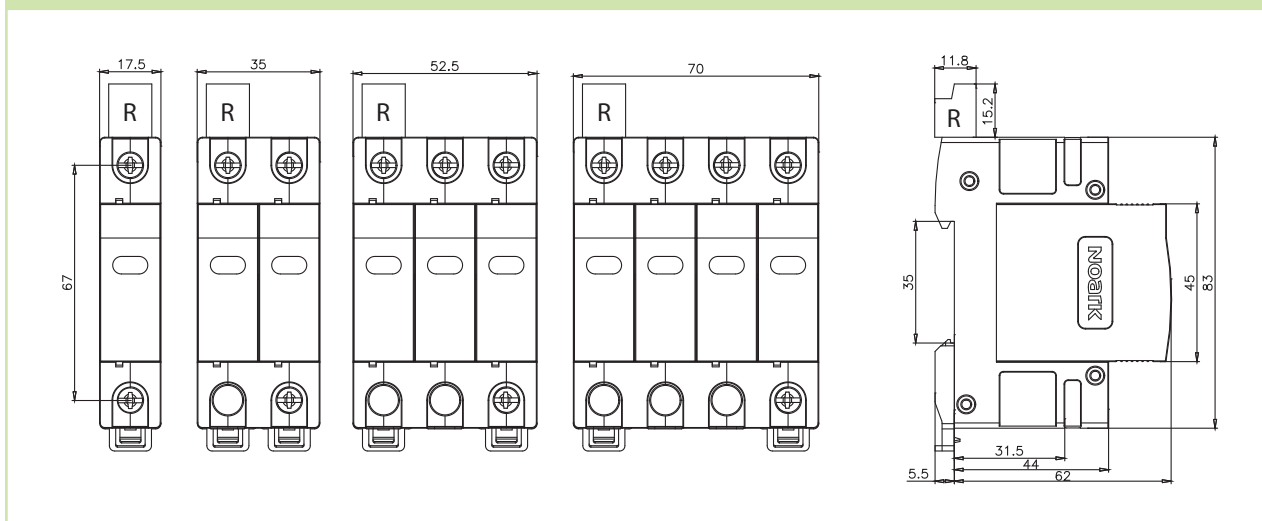
Table of tolerance zones at 1 mA

|               | Max. continuous operational voltage $U_c$ | Voltage tolerance zone at 1mA |
|---------------|---|-------------------------------|
| Ex9UE1+2 12.5 | 275 V                                     | 387 - 473 V                   |
| Ex9UE2 20     | 275 V                                     | 387 - 473 V                   |
|               | 320 V                                     | 459 - 561 V                   |
|               | 385 V                                     | 558 - 682 V                   |
|               | 440 V                                     | 639 - 781 V                   |
| Ex9UE2 30     | 350 V                                     | 504 - 616 V                   |
|               | 440 V                                     | 639 - 781 V                   |
| Ex9UEP 20     | 500/1000 V                                | 643.5 - 786.5 V               |
|               | 600/1200 V                                | 738 - 902 V                   |
|               | 750/1500 V                                | 950 - 1100 V                  |

## Mechanical parameters

|                                  |   |
|----------------------------------|---|
| Device width                     | 17.5 mm (per pole/module)                   |
| Device height                    | 83 mm (89 mm including rail clip)           |
| Frame size                       | 45 mm                                       |
| Method of mounting               | fixed                                       |
| Mounting                         | easy fastening onto 35 mm device rail (DIN) |
| Mounting position                | arbitrary                                   |
| Degree of protection             | IP40, terminals IP20                        |
| Terminals                        | combined lift + open mouthed, M5 screws     |
| Terminal capacity                | 2.5 — 35 mm <sup>2</sup>                    |
| Fastening torque of terminals    | 2 — 3.5 Nm                                  |
| Remote contact terminal capacity | 0.14 — 1.5 mm <sup>2</sup>                  |
| Location                         | indoor                                      |
| Ambient temperature              | -40 — +80 °C                                |
| Altitude                         | ≤ 2000 m                                    |
| Relative humidity                | 30 — 90 %                                   |
| Weight (per pole)                | 0.11 kg                                     |

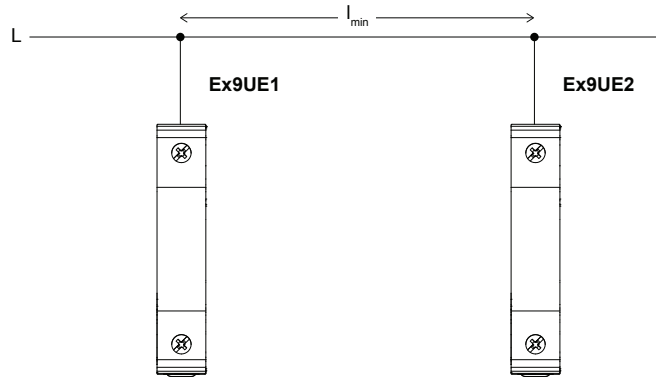
## Dimensions



# Technical Data Ex9UE2

Surge Protection Devices Type 2,  $I_n = 20 \text{ kA} (8/20 \mu\text{s})$

## SPD coordination



| Class I   | Class II       | Min. cable length $I_{min}$ |
|-----------|----------------|-----------------------------|
| Ex9UE1 35 | Ex9UE2 x x 440 | 0                           |
| Ex9UE1 35 | Ex9UE2 x x 275 | $\geq 10 \text{ m}$         |

## Connection diagrams, protection mode

