# DualGuard-S compact cabinets

| Model | DualGuard-S 28 | DualGuard-S 20 | DualGuard-S LAD 100 |
|---|---|---|---|
| Control section: ACU DG-S & HMI | 1 | 1 | 1 |
| PSU | 1 | 1 | 1 |
| BCM.1 | 1 | 1 | 1 |
| SKU.1 CG-S circuit module | 0-28 *2 | 0-20 *2 | 0-3 |
| CM.1 1.7A charging module | 0-1 | 0-1 | 0-1 |
| CM.1 3.4A charging module | 0-6 *1 | 0-6 *1 | 0-8 |
| Cabinet design, electric: | | | |
| Rated voltage | 400/230V | 400/230V | 400/230V |
| Rated frequency | 50/60 Hz | 50/60 Hz | 50/60 Hz |
| Cable placement and grounding system in mains mode / battery mode | TN-C-S/IT | TN-C-S/IT | TN-C-S/IT |
| Max. ambient temperature *4 | -5°C to +35°C | -5°C to +35°C | -5°C to +35°C |
| Protection class | 1 | 1 | 1 |
| Degree of protection | IP21 | IP21 | IP21 |
| Max. rated current (mains) [∑ L1, L2, L3] [A] | 80 | 80 | 100 |
| Max. rated output (mains) [KW] | 18.4 | 18.4 | 23 |
| Max. rated current (battery) [A] | 80 | 80 | 100 |
| Max. rated output (battery) [KW] | 17.3 | 17.3 | 21.6 |
| Three-phase split | yes | yes | yes |
| Connection diameter for mains and battery feed | 50 $mm^2$ | 50 $mm^2$ | 50 $mm^2$ |
| Outlet distributor | 0- 6 outlets | 0- 6 outlets | 0- 15 outlets DC and AC 1-phase, 0-5 outputs AC 3-phase |
| Terminal capacity | 16 $mm^2$ | 16 $mm^2$ | 16 $mm^2$ |
| Max. connection diameter final circuit | 4 $mm^2$ | 4 $mm^2$ | 4 $mm^2$ |
| Max. number of final circuit connections | 88 | 88 | 14 |
| Cabinet design, mechanical: | | | |
| Dimensions H x W x D (mm) | 2070 x 800 x 405 | 2070 x 800 x 405 | 2040 x 800 x 405 |
| Material/design | Sheet steel/free-standing cabinet | Sheet steel/free-standing cabinet | Sheet steel/free-standing cabinet |
| Hinge position | Right | Right | Right |
| Outer finish | Powder coating | Powder coating | Powder coating |
| Color | RAL 7035 | RAL 7035 | RAL 7035 |
| Color touch in-door | Yes | Yes | Yes |
| Partial glazed door | – | – | – |
| Lock mechanism | 3 mm double ward key | 3 mm double ward key | 3 mm double ward key |
| cable inlets on top | Yes | Yes | Yes |
| Cable inlets on bottom | Yes | Yes | Yes |
| Base (optional) | 100/200 | 100/200 | 100/200 |
| Weight (w/o battery) | approx. 180 kg | approx. 170 kg | approx. 170 kg |
| Battery capacity, integrated into: | | | |
| Battery cabinet (H x W x D: 2050 x 800 x 400 mm) | 23.3-245 Ah | 23.3-245 Ah | 23.3-308 Ah |
| Compact cabinet | – | – | – |
| Battery rack | 23.3-245 Ah | 23.3-245 Ah | 23.3-308 Ah |

Other battery sizes on request

*1 When equipped with more than 4 charging modules CM 3.4 A, an upgrade to charging module rack 8-way is necessary.

*2 When equipped with more than 13 SKU.1 CG-S 4 x 1.5 A or 26 SKU.1 CG-S 2 x 3 A/1 x 6 A, a second PSU module is necessary.

*3 When equipped with 1 charging module CM 3.4 A, an additional charging module rack 1-way must be configured.

*4 Optimum ambient temperature battery +20 °C.

| DualGuard-S 20C6 | DualGuard-S 12C6 | DualGuard-S 12C | DualGuard-S 12C4 | DualGuard-S 4C3 |
|---|---|---|---|---|
| 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 |
| 0-20 *2 | 0-12 | 0-12 | 0-12 | 0-5 |
| 0-1 | 0-1 | 0-1 | 1 | 1 |
| 0-2 | 0-2 | 0-1 *3 | – | – |
| | | | | |
| 400/230V | 230V | 230V | 230V | 230V |
| 50/60 Hz | 50/60 Hz | 50/60 Hz | 50/60 Hz | 50/60 Hz |
| TN-C-S/IT | TN-C-S/IT | TN-C-S/IT | TN-C-S/IT | TN-C-S/IT |
| | | | | |
| -5°C to +35°C | -5°C to +35°C | -5°C to +35°C | -5°C to +35°C | -5°C to +35°C |
| 1 | 1 | 1 | 1 | 1 |
| IP21 | IP21 | IP21 | IP21 | IP21 |
| 50 | 50 | 35 | 25 | 12 |
| 14.5 | 14.5 | 13.8 | 5.8 | 3.5 |
| 50 | 50 | 35 | 25 | 12 |
| 13.6 | 13.6 | 7.6 | 5.4 | 2.6 |
| – | – | – | – | – |
| 35 $mm^2$ | 16 $mm^2$ | 16 $mm^2$ | 16 $mm^2$ | 16 $mm^2$ |
| 2 outlets | 1 outlet | 1 outlet | 1 outlet | – |
| | | | | |
| 35 $mm^2$ | 35 $mm^2$ | 35 $mm^2$ | 16 $mm^2$ | – |
| 4 $mm^2$ | 4 $mm^2$ | 4 $mm^2$ | 4 $mm^2$ | 4 $mm^2$ |
| 68 | 48 | 48 | 48 | 20 |
| | | | | |
| 2070 x 800 x 605 | 2040 x 800 x 605 | 2040 x 800 x 405 | 1800 x 600 x 405 | 1000 x 600 x 305 |
| Compact cabinet | Compact cabinet | Compact cabinet | Compact cabinet | Compact cabinet |
| | | | | |
| Right | Right | Right | Right | Right |
| Powder coating | Powder coating | Powder coating | Powder coating | Powder coating |
| RAL 7035 | RAL 7035 | RAL 7035 | RAL 7035 | RAL 7035 |
| – | – | – | – | – |
| Yes | Yes | Yes | Yes | Yes |
| 3mm double ward key | 3mm double ward key | 3mm double ward key | 3mm double ward key | 3mm double ward key |
| Yes | Yes | Yes | Yes | Yes |
| No | No | No | No | No |
| 100/200 | 100/200 | 100/200 | 100/200 | – |
| approx. 205 kg | approx. 206 kg | approx. 155 kg | approx. 115 kg | approx. 50 kg |
| | | | | |
| – | – | – | – | – |
| 5.5-89.4 Ah | 5.5-89.4 Ah | 23.3-53.7 Ah | 5.5-23.3 Ah | 5.5-16 Ah |
| – | – | – | – | – |

# DualGuard-S US sub-stations

| Model | DualGuard-S US 38 | DualGuard-S US 30 | DualGuard-S US 23 | DualGuard-S US 15 | DualGuard-S US 7 |
|---|---|---|---|---|---|
| Modules: | | | | | |
| Control section: ACU DG-S & HMI | 1 | 1 | 1 | 1 | 1 |
| PSU | 1 | 1 | 1 | 1 | 1 |
| SKU.1 CG-S circuit module | 0-38 *2 | 0-30 *2 | 0–23 *1 | 0-15 | 0-7 |
| Cabinet design, electric: | | | | | |
| Rated voltage | 400/230V | 400/230V | 230V | 230V | 230V |
| Rated frequency | 50/60 Hz | 50/60 Hz | 50/60 Hz | 50/60 Hz | 50/60 Hz |
| Cable placement and grounding system in mains/battery mode | TN-C-S/IT | TN-C-S/IT | TN-C-S/IT | TN-C-S/IT | TN-C-S/IT |
| Max. ambient temperature range | -5°C to +35°C | -5°C to +35°C | -5°C to +35°C | -5°C to +35°C | -5°C to +35°C |
| Protection class | 1 | 1 | 1 | 1 | 1 |
| Degree of protection | IP21 | IP21 | IP54 | IP54 | IP54 |
| Max. rated current (mains) [∑ L1, L2, L3] [A] | 80 | 80 | 50 | 50 | 25 |
| Max. rated output (mains) [KW] | 18.4 | 18.4 | 11.5 | 11.5 | 6.9 |
| Max. rated current (battery) [A] | 80 | 80 | 50 | 50 | 25 |
| Max. rated output (battery) [KW] | 17.3 | 17.3 | 10.8 | 10.8 | 6.5 |
| Three-phase split | Yes | Yes | No | No | No |
| Connection diameter for mains and battery feed | 35 $mm^2$ | 35 $mm^2$ | 35 $mm^2$ | 16 $mm^2$ | 16 $mm^2$ |
| Terminal capacity | – | – | – | – | – |
| Max. connection diameter of final circuit | 4 $mm^2$ | 4 $mm^2$ | 4 $mm^2$ | 4 $mm^2$ | 4 $mm^2$ |
| Max. number of final circuit connections | 88 | 88 | 52 | 32 | 28 |
| Cabinet design, mechanical: | | | | | |
| Dimensions H x W x D (mm) | 2070 x 800 x 405 | 2070 x 800 x 405 | 1200 x 600 x 305 | 800 x 600 x 305 | 750 x 400 x 305 |
| Material/design | Sheet steel/ free-standing cabinet | Sheet steel/ free-standing cabinet | Sheet steel/wall cabinet | Sheet steel/wall cabinet | Sheet steel/wall cabinet |
| Hinge position | Right | Right | Right | Right | Right |
| Outer finish | Powder coating | Powder coating | Powder coating | Powder coating | Powder coating |
| Color | RAL 7035 | RAL 7035 | RAL 7035 | RAL 7035 | RAL 7035 |
| Partial glazed door | Yes | Yes | No | No | No |
| Lock mechanism | 3 mm double ward key | 3 mm double ward key | 3 mm double ward key | 3 mm double ward key | 3 mm double ward key |
| Cable inlets on top | Yes | Yes | Yes | Yes | Yes |
| Cable inlets on bottom | Yes | Yes | No | No | No |
| Base (optional) | 100/200 | 100/200 | - | – | – |
| Weight (w/o battery) | approx. 170 kg | approx. 165 kg | approx. 110 kg | approx. 75 kg | approx. 42 kg |

*1 A maximum of 12 SKU.1 CG-S 4 x 1.5 A may be installed.

# DualGuard-S SOU sub-stations

| Model | SOU2 | SOU1 |
|---|---|---|
| SKU.1 CG-S *1 circuit module | including 2 x SOU CG-S 2 x 4A | including 1 x SOU CG-S 2 x 4A |
| Cabinet design, electric: | | |
| Rated voltage | 230V | 230V |
| Rated frequency | 50/60 Hz | 50/60 Hz |
| Cable placement and grounding system in mains/ battery mode | TN-C-S/IT | TN-C-S/IT |
| Max. ambient temperature range | -5°C to +35°C | -5°C to +35°C |
| Protection class | 2 | 2 |
| Degree of protection | IP65 | IP65 |
| Max. rated current (mains) [∑ L1, L2, L3] [A] | 16 | 8 |
| Max. rated output (mains) [KW] | 3.6 | 1.8 |
| Max. rated current (battery) [A] | 16 | 8 |
| Max. rated output (battery) [KW] | 3.4 | 1.7 |
| Three-phase split | No | No |
| Connection diameter for mains and battery feed | 10 $mm^2$ | 10 $mm^2$ |
| Max. connection diameter of final circuit | 4 $mm^2$ | 4 $mm^2$ |
| Max. number of final circuit connections | 4 | 2 |
| Cabinet design, mechanical: | | |
| Dimensions H x W x D (mm) | 583 x 295 x 129 | 458 x 295 x 129 |
| Material/design | Plastic small distribution board | Plastic small distribution board |
| Hinge position | Right | Right |
| Color | RAL 7035 | RAL 7035 |
| Partial glazed door | Yes | Yes |
| Lock mechanism | On request | On request |
| Cable inlets on top | Yes | Yes |
| Weight (w/o battery) | approx. 8.8 kg | approx. 7.5 kg |

# DualGuard-S ESF sub-stations

| Model | DualGuard-S ESF30 15P | DualGuard-S ESF30 30P |
|---|---|---|
| Modules: | | |
| Control section: ACU DG-S & HMI | 1 | 1 |
| PSU | 1 | 1 |
| SKU.1 CG-S 1 x 6A circuit module | 0-15 | 0-30 |
| SKU.1 CG-S 2 x 3A circuit module | 0-15 | 0-30 |
| SKU.1 CG-S 4 x 1.5A circuit module | 0-15 | 0-30 |
| DLS/TLS interface module | 1 | 2 |
| Cabinet design, electric: | | |
| Rated voltage | 230V | 400/230V |
| Rated frequency | 50/60 Hz | 50/60 Hz |
| Ventilation, decibel level (dB) | 55 | 55 |
| Cable placement and grounding system in mains/battery mode | TN-C-S/IT | TN-C-S/IT |
| Max. ambient temperature range | -5°C to +35°C | -5°C to +30°C |
| Protection class | I | I |
| Degree of protection | IP42 | IP42 |
| Max. total rated current [A] relative to ambient temperature<br>+25°C<br>+30°C<br>+35°C | <br><br>33<br>33<br>33 | <br><br>48<br>48<br>48 |
| Max. total rated output [A] relative to ambient temperature<br>+25°C<br>+30°C<br>+35°C | <br>7<br>7<br>7 | <br>10.3<br>10.3<br>10.3 |
| Three-phase split | No | Yes |
| Connection diameter for mains and battery feed | 35 mm² | 35 mm² |
| Max. connection diameter of final circuit | 4 mm² | 4 mm² |
| Max. number of final circuit connections | 40 | 58 |
| Cabinet design, mechanical: | | |
| Dimensions H x W x D (mm) | 1265 x 898 x 449 | 2278x918x604 |
| Material/design | Coated gypsum fiber-board/wall cabinet | Coated gypsum fiber-board/free-standing cabinet |
| Hinge position | Right | Right |
| Color | RAL 7035 | RAL 7035 |
| Cable entry | From above | From above |
| Base (optional) | – | – only with base |
| Weight | 210 kg | approx. 330 kg |
| Licenses/certifications | | |
| ABZ housing including components Z-86.3 ...<br>ABZ empty housing Z-86.1 ...<br>Summary report for functional integrity fire test MPA NRW<br>VDE certificate<br>Specialized company declaration | Yes<br>Yes<br>Yes<br>–<br>Yes | Yes<br>Yes<br>Yes<br>–<br>Yes |

# DualGuard-S ESF sub-stations SOU

| Model | ESF30 SOU5 | ESF30 SOU4 IO | ESF30 SOU3 | ESF30 SOU2 | ESF30 SOU1 |
|---|---|---|---|---|---|
| Modules: | | | | | |
| SOU CG-S 2 x 4 A circuit switching module | 5 | 4 | 3 | 2 | 1 |
| 3-PM-IO / 3-PM-IO-INV Modules | – | 0-2 | – | – | – |
| Cabinet design, electric: | | | | | |
| Rated voltage | 230V | 230V | 230V | 230V | 230V |
| Rated frequency | 50 or 60 Hz | 50 or 60 Hz | 50 or 60 Hz | 50 or 60 Hz | 50 or 60 Hz |
| Ventilation, decibel level (dB) | – | – | – | – | – |
| Cable placement and grounding system in mains/battery mode | TN-C-S/IT | TN-C-S/IT | TN-C-S/IT | TN-C-S/IT | TN-C-S/IT |
| Max. ambient temperature range | -5°C to +35°C | -5°C to +35°C | -5°C to +35°C | -5°C to +35°C | -5°C to +35°C |
| Protection class | II | II | II | II | II |
| Degree of protection | IP54 | IP54 | IP54 | IP54 | IP54 |
| Maximum installed heat dissipation performance [W] | | | | | |
| Max. total rated current [A] relative to ambient temperature<br>+25°C<br>+30°C<br>+35°C | <br>33<br>28<br>16 | <br>33<br>28<br>16 | <br>20<br>17<br>10 | <br>15<br>12<br>9 | <br>8<br>6<br>5 |
| Max. total rated power [W] relative to ambient temperature<br>+25°C<br>+30°C<br>+35°C | <br>7.1<br>6.0<br>3.4 | <br>7.1<br>6.0<br>3.4 | <br>4.3<br>3.6<br>2.1 | <br>3.2<br>2.5<br>1.9 | <br>1.7<br>1.2<br>1.0 |
| Three-phase split | No | No | No | No | No |
| Connection diameter for mains and battery feed | 10 mm² | 10 mm² | 10 mm² | 10 mm² | 10 mm² |
| Max. connection diameter final circuit | 4 mm² | 4 mm² | 4 mm² | 4 mm² | 4 mm² |
| Max. number of final circuit connections | 10 | 8 | 6 | 4 | 2 |
| Cabinet design, mechanical: | | | | | |
| Dimensions H x W x D (mm) | 1228 x 478 x 295 | 1228 x 478 x 295 | 928 x 478 x 295 | 778 x 478 x 295 | 628 x 478 x 295 |
| Material/design | Fire protection panels | Fire protection panels | Fire protection panels | Fire protection panels | Fire protection panels |
| Hinge position | Left | Left | Left | Left | Left |
| Color | RAL 7035 | RAL 7035 | RAL 7035 | RAL 7035 | RAL 7035 |
| Cable entry | From above | From above | From above | From above | From above |
| Weight (w/o battery) | approx. 103 kg | approx. 103 kg | approx. 80 kg | approx. 69 kg | approx. 60 kg |
| Licenses/certifications | | | | | |
| ABZ housing including components Z-86.2 ...<br>ABZ empty housing Z-86.1 ...<br>Summary report for functional integrity fire test MPA STGT<br>VDE certificate<br>CE declaration of conformity | Will be required<br>Yes<br>Yes<br>-<br>Yes | Will be required<br>Yes<br>Yes<br>-<br>Yes | Will be required<br>Yes<br>Yes<br>-<br>Yes | Will be required<br>Yes<br>Yes<br>-<br>Yes | Will be required<br>Yes<br>Yes<br>-<br>Yes |

# Determination of battery capacity

DualGuard-S – central battery system

**Table 1**

Determining the required battery capacity from maintenance-free AGiV block batteries as per EN 50171 (larger battery capacities on request).

| C10 battery capacity at 1.8V/cell and +20°C | Ah | 5.5 | 8.5 | 16.0 | 23.3 | 32.0 | 39.8 | 50.4 | 53.7 | 66.2 | 85.7 | 89.4 | 106.0<br>1 x 39.8<br>1 x 66.2 | 118.0 | 143.1<br>1 x 89.4<br>1 x 53.7 | 155.6<br>1 x 89.4<br>1 x 66.2 | 178.8<br>2 x 89.4 | 195.4<br>1 x 89.4<br>1 x 66.2<br>1 x 39.8 | 245.0<br>2 x 89.4<br>1 x 66.2 | 268.2<br>3 x 89.4 | 308.0<br>3 x 89.4<br>1 x 39.8 | 357.6<br>4 x 89.4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max. discharge current [A] at rated operating period [h], 1.8V per cell and +20°C ambient temperature | **1.0** | 3.2 | 4.5 | 10.7 | 15.4 | 20.2 | 24.1 | 30.7 | 37.9 | 49.2 | 52.6 | 63.8 | 73.3 | 85.1 | 101.7 | 113.0 | 127.6 | 137.1 | 176.8 | 191.4 | 215.5 | 255.2 |
| | **1.5** | 2.5 | 3.4 | 8.3 | 11.9 | 15.0 | 19.0 | 22.7 | 27.6 | 34.5 | 38.3 | 46.1 | 53.5 | 60.0 | 73.7 | 80.6 | 92.2 | 99.6 | 126.7 | 138.3 | 157.3 | 194.7 |
| | **2.0** | 2.1 | 2.9 | 6 | 9.2 | 12.3 | 14.6 | 18.5 | 21.5 | 26.3 | 31.0 | 36.0 | 40.9 | 46.9 | 57.5 | 62.3 | 72.0 | 76.9 | 98.3 | 108.0 | 122.6 | 144.0 |
| | **3.0** | 1.5 | 2.1 | 4.4 | 6.9 | 9.1 | 11.0 | 13.6 | 15.8 | 18.2 | 23.1 | 26.5 | 29.2 | 33.3 | 42.3 | 44.7 | 53.0 | 55.7 | 71.2 | 79.5 | 90.5 | 106.0 |
| | **8.0** | 0.7 | 1.0 | 1.9 | 2.8 | 3.7 | 4.8 | 5.9 | 6.6 | 7.9 | 10.3 | 11.0 | 12.7 | 14.2 | 17.6 | 18.9 | 22.0 | 23.7 | 29.9 | 33.0 | 37.8 | 44.0 |

**Special note:** The aging allowance of 25% for the batteries is not included in the discharge current figures.

**Table 2**

Number of 1.7A and 3.4A charging modules given a recharging time as per DIN EN 50171 of:

| C10 battery capacity at 1.8 V/cell and +20°C | h | A | 5.5 | 8.5 | 16.0 | 23.3 | 32.0 | 39.8 | 50.4 | 53.7 | 66.2 | 85.7 | 89.4 | 106.0 | 118.0 | 143.1 | 155.6 | 178.8 | 195.4 | 245.0 | 268.2 | 308.0 | 357.6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 hours/80% | **1.0** | 1.7 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |
| | | 3.4 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 3 | 4 | 4 | 5 | 6 |
| | **1.5** | 1.7 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 |
| | | 3.4 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 5 | 6 | 6 |
| | **2.0** | 1.7 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| | | 3.4 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 3 | 4 | 5 | 5 | 6 | 7 |
| | **3.0** | 1.7 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |
| | | 3.4 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 6 | 6 | 7 |
| | **8.0** | 1.7 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 |
| | | 3.4 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 4 | 4 | 4 | 6 | 6 | 7 | 8 |

**Table 3**

Number of battery cabinets; battery weight

| C10 battery capacity at 1.8 V/cell and +20°C | 5.5 | 8.5 | 16.0 | 23.3 | 32.0 | 39.8 | 50.4 | 53.7 | 66.2 | 85.7 | 89.4 | 106.0 | 118.0 | 143.1 | 155.6 | 178.8 | 195.4 | 245.0 | 268.2 | 308.0 | 357.6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number of battery cabinets (weight/cabinet approx. 150 kg) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 4 | 4 |
| Total weight per battery set approx. kg | 45 | 65 | 99 | 180 | 243 | 252 | 351 | 405 | 499 | 527 | 594 | 612 | 900 | 1000 | 1093 | 1296 | 1354 | 1687 | 1782 | 1782 | 2376 |

**Table 4**

Determination of air supply and ventilation in electrical operating rooms according to DIN EN IEC 62485-2 (calculated for boost charge):

| 216V battery | 5.5 | 8.5 | 16.0 | 23.3 | 32.0 | 39.8 | 50.4 | 53.7 | 66.2 | 85.7 | 89.4 | 106.0 | 118.0 | 143.1 | 155.6 | 178.8 | 195.4 | 245.0 | 268.2 | 308.0 | 357.6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Air volume flow required to ventilate the installation space [$m^3$/h] | 0.24 | 0.37 | 0.69 | 1.01 | 1.38 | 1.72 | 2.18 | 2.32 | 2.86 | 3.70 | 3.86 | 4.58 | 5.10 | 6.18 | 6.72 | 7.72 | 8.44 | 10.58 | 11.59 | 13.31 | 15.45 |
| Ventilation cross-section of the inlet and outlet openings of the installation space [$cm^2$] | 6.65 | 10.28 | 19.35 | 28.18 | 38.71 | 48.14 | 60.96 | 64.96 | 80.08 | 103.66 | 108.14 | 128.22 | 142.73 | 173.09 | 188.21 | 216.28 | 236.36 | 296.35 | 324.41 | 372.56 | 432.55 |

**Table 5**

Determination of air supply and ventilation in electrical operating rooms according to DIN EN IEC 62485-2 (calculated for trickle charge*):

| 216V battery | 5.5 | 8.5 | 16.0 | 23.3 | 32.0 | 39.8 | 50.4 | 53.7 | 66.2 | 85.7 | 89.4 | 106.0 | 118.0 | 143.1 | 155.6 | 178.8 | 195.4 | 245.0 | 268.2 | 308.0 | 357.6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Air volume flow required to ventilate the installation space [$m^3$/h] | 0.03 | 0.05 | 0.09 | 0.13 | 0.17 | 0.21 | 0.27 | 0.29 | 0.36 | 0.46 | 0.48 | 0.57 | 0.64 | 0.77 | 0.84 | 0.97 | 1.06 | 1.32 | 1.45 | 1.66 | 1.93 |
| Ventilation cross-section of the inlet and outlet openings of the installation space [$cm^2$] | 0.83 | 1.29 | 2.42 | 3.52 | 4.84 | 6.02 | 7.62 | 8.12 | 10.01 | 12.96 | 13.52 | 16.03 | 17.84 | 21.64 | 23.53 | 27.03 | 29.54 | 37.04 | 40.55 | 46.57 | 54.07 |

* If a boost charge is not frequently used (for example, once a month), the air flow rate for ventilation can be calculated based on the trickle charge current.