

ES Box

Containerized plug and play power conversion system adapted to customer requirements and local standards for energy storage application

The ES Box is a power conversion system for energy storage applications that performs AC/DC/AC conversion between the battery and grid network. The ES Box includes an LV/MV transformer, and protects maintenance staff and the installation against electrical faults, such as short-circuit and lightning. The optimized versions of the ES Box reduces balance-of-systems costs, and increases reliability, and improves construction lead times.

Why choose ES Box?



True bankability

- Warranty from a trusted partner with 180 years of experience
- World leader in industrial power drives, UPS, and electrical distribution
- Strong service infrastructure worldwide to support your global needs



Higher return on investment

- Compressed construction lead-times through factory integrated solution
- Reduced transportation, off-loading and on-site labor costs
- Enhanced uptime thanks to qualified and reliable designs



Designed for reliability

- Industrialized solution according to Schneider Electric proven industrial processes
- Equipment and integration made in Schneider Electric factories
- Configurable to withstand severe weather conditions: continental, tropical and desertic environments
- Undergone extensive safety, quality and reliability risk mitigation
- Proven robust design through rigorous Custom Reliability Testing
- IEC62271-202 compliant



Flexible

- Ready for a vast majority of storage technologies
- Range of choices for power and AC medium voltage levels
- Suitable for most environmental conditions and local standards
- Configurable to be optimized for specific project needs



Easy to service

- Fully monitored solution
- Convenient and safe enclosure design for maintenance purposes
- Local Schneider Electric service and maintenance available in 100+ countries



Easy to install

- Ease in transportation due to different optimized design RT & ST (minimized width, height and length for easy shipping by road or by sea)
- Solution delivered pre-assembled, configured and tested to reduce on-site labor and project duration



ES Box RT



ES Box ST and ES Box ST

Product applications



Ancillary Services



Renewable Energy Shifting and/or Smoothing



End User Energy Optimization & MicroGrids



Diesel Offset

| Device short name | ES Box RT 1080 | ES Box RT 1260 | ES Box RT 1360 |
|---|--|----------------------------|----------------------------|
| Electrical specifications | | | |
| DC input | | | |
| DC operating voltage range | 440 - 850 V (at PF=1) | 510 - 850 V (at PF=1) | 550 - 850 V (at PF=1) |
| Max. DC operating current | 2 x 1280 A | 2 x 1280 A | 2 x 1280 A |
| Max DC short circuit current withstand (up to 1s) (XC-NA ES Inverter level) | 85 kA per battery | | |
| AC output | | | |
| Output power (S) | 1080 kVA | 1260 kVA | 1360 kVA |
| Nominal voltage | up to 36 kV | up to 36 kV | up to 36 kV |
| Frequency | 50/60 Hz | 50/60 Hz | 50/60 Hz |
| Power factor range (PQ dispatch) | 0 to 1 leading and lagging | 0 to 1 leading and lagging | 0 to 1 leading and lagging |
| Equipment | | | |
| Inverters | 2 x XC ES 540 | 2 x XC ES 630 | 2 x XC ES 680 |
| Transformer type | Schneider Electric Minera oil type ONAN | | |
| Transformer losses | C0Bk (according to EN 50464-1) or compliant with Ecodesign regulation (depending on geographies) | | |
| Medium voltage switchgear $U \leq 24$ kV | Schneider Electric RM6 ring main unit type NE-DI with Sepam 10 protection relay | | |
| Medium voltage switchgear 24 kV $\leq U \leq 36$ kV | Schneider Electric Flusarc ring main unit type CB-C with Sepam 10 protection relay | | |
| Optional content | | | |
| Automatic progressive reconnection ⁽¹⁾ | MV circuit breaker motorization, configurable timer | | |
| Auxiliary power transformer | 10 kVA / 400 V | | |
| Monitoring and control | Conext Control monitoring cabinet with secured power supply | | |
| Safety kit | Fire-extinguisher, insulated MV rod and gloves, insulating stool | | |
| Service kit | Contacts on doors and smoke detector (available with Conext Control option) | | |
| Service contract | Worldwide service team - consult your sales representative for service offer | | |
| External operating conditions | | | |
| Temperature | | | |
| Standard temperature range | -10°C / +40°C ⁽²⁾ | | |
| Other temperature ranges | Continental (-20°C / +45°C), Desert / Tropical (-10°C / +50°C), Very cold (-35°C / + 45°C) | | |
| Pollution | | | |
| Standard low polluted environment (Rural and suburban environment) | G4 filters | | |
| Option polluted environment (desert, urban...) ⁽³⁾ | External filter box (G4 and F9 filters, fans, speed drives) | | |
| Other conditions | | | |
| Max. relative humidity | 100% condensing | | |
| Max. altitude above sea level ⁽⁴⁾ | 2000 m | | |
| Max. wind speed | 123 km / h | | |
| Max. snow load | 250 kg / m ² | | |
| IP grade LV / MV compartment | IP44 / IP 54 | | |
| IP grade transformer compartment | IP23 | | |
| General specifications | | | |
| Dimensions and weight | | | |
| During transportation (H x W x D) | 3.10 x 2.50 x 8.90 (or 9.70 ⁽⁵⁾) m | | |
| Assembled on site (H x W x D) | 2.65 x 3.15 x 8.90 (or 9.70 ⁽⁵⁾) m | | |
| Weight approx. with standard content | 24 tons | | |
| Material | | | |
| Basement | Concrete basement included | | |
| Walls and roof | Sandwich panel with mineral wool (50mm) EI 30 minutes | | |
| Cooling | | | |
| LV and MV switchboard compartment ⁽⁶⁾ | Ensured by inverter fans. | | |
| Transformer compartment | Natural | | |
| Regulatory approval | | | |
| Electrical standards | IEC 62271-202, IEC 61439, IEC 62271-200, IEC 60076 | | |
| Type-test certification | IEC 62271-202 | | |
| Internal arc classification (acc. to IEC 62271-202) | IAC-A | | |
| General ventilation filters standard | EN779:2012 | | |
| Building standards | Eurocodes | | |

Specifications are subject to change without notice.

⁽¹⁾To avoid simultaneous reconnection of every ES Boxes and for automatic opening and reclosing on grid voltage loss (grid requirement). ⁽²⁾Derating: See Conext Core XC inverter application note.

⁽³⁾ For dust or sand (IEC 60721-2-5 (§4.2.4)) size < 150 µm and concentration < 2 mg / m³. ⁽⁴⁾Power derating above 1000 m. Above 2000 m special requirements. ⁽⁵⁾In case of filter box option.

⁽⁶⁾ Extra fans in filter box only for polluted environment.

| Device short name | ES Box ST 1080 | ES Box ST 1260 | ES Box ST 1360 |
|--|--|----------------------------|----------------------------|
| Electrical specifications | | | |
| DC input | | | |
| DC operating voltage range | 440 - 850 V (at PF=1) | 510 V (at PF=1) | 550 V (at PF=1) |
| Max. DC operating current | 2 x 1280 A | 2 x 1280 A | 2 x 1280 A |
| AC output | | | |
| Output power (S) | 1080 kVA | 1260 kVA | 1360 kVA |
| Nominal voltage | up to 36 kV | up to 36 kV | up to 36 kV |
| Frequency | 50/60 Hz | 50/60 Hz | 50/60 Hz |
| Power factor range (PQ dispatch) | 0 to 1 leading and lagging | 0 to 1 leading and lagging | 0 to 1 leading and lagging |
| Equipment | | | |
| Inverters | 2 x XC 540 | 2 x XC 630 | 2 x XC 680 |
| Transformer type | Schneider Electric Minera oil type ONAN | | |
| Transformer losses | C0Bk (according to EN 50464-1) or compliant with Ecodesign regulation (depending on geographies) | | |
| Medium voltage switchgear $U_{\leq 24}$ kV | Schneider Electric RM6 ring main unit type NE-DI with Sepam 10 protection relay | | |
| Medium voltage switchgear $24 \text{ kV} \leq U \leq 36$ kV | Schneider Electric Flusarc ring main unit type CB-C with Sepam 10 protection relay | | |
| Optional content | | | |
| Automatic progressive reconnection ⁽¹⁾ | MV circuit breaker motorization, configurable timer | | |
| Auxiliary power transformer | 10 kVA / 400 V | | |
| Monitoring and control | Conext Control monitoring cabinet with secured power supply | | |
| Safety kit | Fire-extinguisher, insulated MV rod and gloves, insulating stool | | |
| Service kit | Contacts on doors and smoke detector (available with Conext Control option) | | |
| Service contract | Worldwide service team - consult your sales representative for service offer | | |
| External operating conditions | | | |
| Temperature | | | |
| Standard temperature range | -10°C / +45°C ⁽²⁾ | | |
| Other temperature ranges | Continental (-20°C / +45°C), Desert / Tropical (-10°C / +50°C) | | |
| Pollution | | | |
| Standard low polluted environment (Rural and suburban environment) | G4 filters | | |
| Option polluted environment (desert, urban...) ⁽³⁾ | Internal filter box (G4 and F9 filters, fans, speed drives) | | |
| Option saline environment | C5 paint | | |
| Other conditions | | | |
| Max. relative humidity | 100% condensing | | |
| Max. altitude above sea level ⁽⁴⁾ | 2000 m | | |
| Max. wind speed | 180 km / h | | |
| Max. snow load | 250 kg / m ² | | |
| IP grade LV / MV compartment | IP44 / IP 54 | | |
| IP grade transformer compartment | IP23 | | |
| General specifications | | | |
| Dimensions and weight | | | |
| During transportation (H x W x D) | 2.90 x 2.44 x 12.19 m | | |
| Assembled on site (H x W x D) | 2.90 x 3.38 (or 3.28 ⁽⁵⁾) x 12.19 m | | |
| Weight approx. with standard content | 19 tons | | |
| Material | | | |
| Basement | Light basement to be done on site | | |
| Walls and roof | Standard 40" ISO high cube container with insulating layer | | |
| Cooling | | | |
| LV and MV switchboard compartment ⁽⁶⁾ | Ensured by inverter fans. | | |
| Transformer compartment | Natural | | |
| Regulatory approvals | | | |
| Electrical standards | IEC 62271-202, IEC 61439, IEC 62271-200, IEC 60076 | | |
| Type-test certification | IEC 62271-202 | | |
| Internal arc classification (acc. to IEC 62271-202) | IAC-A | | |
| General ventilation filters standard | EN779:2012 | | |
| Building standards | Eurocodes | | |

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⁽¹⁾To avoid simultaneous reconnection of every ES Boxes and for automatic opening and reclosing on grid voltage loss (grid requirement). ⁽²⁾Derating: See Conext Core XC inverter application note.

⁽³⁾ For dust or sand (IEC 60721-2-5 (§4.2.4)) size<150 µm and concentration<2 mg / m³. ⁽⁴⁾Power derating above 1000 m. Above 2000 m special requirements. ⁽⁵⁾In case of filter box option.

⁽⁶⁾ Extra fans in filter box only for polluted environment.

| Device short name | ES Box ST+ 1620 | ES Box ST+ 1890 | ES Box ST+ 2040 |
|--|---|----------------------------|----------------------------|
| Electrical specifications | | | |
| DC input | | | |
| DC operating voltage range | 440 V (at PF=1) | 510 - 850 V (at PF=1) | 550 - 850 V (at PF=1) |
| Max. DC operating current | 3 x 1280 A | 3 x 1280 A | 3 x 1280 A |
| AC output | | | |
| Output power (S) | 1620 kVA | 1890 kVA | 2040 kVA |
| Nominal voltage | up to 36 kV | up to 36 kV | up to 36 kV |
| Frequency | 50/60 Hz | 50/60 Hz | 50/60 Hz |
| Power factor range (PQ dispatch) | 0 to 1 leading and lagging | 0 to 1 leading and lagging | 0 to 1 leading and lagging |
| Equipment | | | |
| Inverters | 3 x XC ES 540 | 3 x XC ES 630 | 3 x XC ES 680 |
| Transformer type | Schneider Electric Minera oil type ONAN | | |
| Transformer losses | C0Bk (according to EN 50464-1) or compliant with Ecodesign regulation (depending on geographies) | | |
| Medium voltage switchgear $U_{\leq 24}$ kV | Schneider Electric RM6 ring main unit type NE-DI with Sepam 10 protection relay | | |
| Medium voltage switchgear $24 \text{ kV} \leq U \leq 36$ kV | Schneider Electric Flusarc ring main unit type CB-C with Sepam 10 protection relay | | |
| Optional content | | | |
| Monitoring and control | Conext Control™ (by Schneider Electric) monitoring cabinet with secured power supply | | |
| Automatic progressive reconnection ⁽¹⁾ | MV circuit breaker motorization, configurable timer | | |
| Auxiliary power transformer | 10 kVA / 400 V | | |
| Safety kit | Fire-extinguisher, insulated MV rod and gloves, insulating stool | | |
| Service kit | Contacts on doors and smoke detector (available with Conext Control option) | | |
| Service contract | Worldwide service team - consult your sales representative for service offer | | |
| External operating conditions | | | |
| Temperature | | | |
| Standard temperature range | -10°C / +45°C ⁽²⁾ | | |
| Other temperature ranges | Continental (-20°C / +45°C) Desert (-10°C / +50°C) | | |
| Pollution | | | |
| Standard low polluted environment (Rural and suburban environment) | G4 filters | | |
| Option polluted environment (desert, urban...) ⁽³⁾ | Internal filter box (G4 and F9 filters, fans, speed drives) | | |
| Option saline environment | C5 paint | | |
| Other conditions | | | |
| Max. relative humidity | 100% condensing | | |
| Max. altitude above sea level ⁽⁴⁾ | 2000 m | | |
| Max. wind speed | 180 km / h | | |
| Max. snow load | 250 kg / m ² | | |
| IP grade LV / MV compartment | IP44 / IP 54 | | |
| General specifications | | | |
| Dimensions and weight | | | |
| During transportation (H x W x D) | 2.90 x 2.44 x 12.19 m + Transformer | | |
| Assembled on site (H x W x D) | 2.90 x 3.38 (or 3.2 ⁽⁵⁾) x 12.19 m + Transformer (may change according to selected configuration; confirm with your sales representative) | | |
| Weight approx. with standard content | < 26 tons + Transformer | | |
| Material | | | |
| Basement | Light basement to be done on site for PV Box and Transformer | | |
| Walls and roof | Standard 40" ISO high cube container with insulating layer | | |
| Cooling | | | |
| LV and MV switchboard compartment ⁽⁶⁾ | Ensured by inverter fans. | | |
| Transformer | Installed outdoor | | |
| Regulatory approvals | | | |
| Electrical standards | IEC 62271-202, IEC 61439, IEC 62271-200, IEC 60076 | | |
| Internal arc classification (acc. to IEC 62271-202) | IAC-A | | |
| General ventilation filters standard | EN779:2012 | | |
| Building standards | Eurocodes | | |

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⁽¹⁾To avoid simultaneous reconnection of every ES Boxes and for automatic opening and reclosing on grid voltage loss (grid requirement). ⁽²⁾Derating: See Conext Core XC inverter application note.

⁽³⁾For dust or sand (IEC 60721-2-5 (§4.2.4)) size<150 µm and concentration<2 mg / m³. ⁽⁴⁾Power derating above 1000 m. Above 2000 m special requirements. ⁽⁵⁾In case of filter box option.

⁽⁶⁾Extra fans in filter box only for polluted environment.