

OXYGEN

Oxygen, thanks to a suitable sizing of the power components and a remarkable response speed (<3 milliseconds) is able to face lowering (SAG) of the grid voltage of a maximum duration of one minute.

The energy required is taken directly from the network. Current models are able to cover network downing up to 50% of the nominal value (-50%).

The voltage compensation on the buck/boost primary winding is performed by IGBT static switches controlled by a microcontroller. The microcontroller system monitors the output voltage and determines the opening or closing of the IGBT contacts ensuring the best regulation.

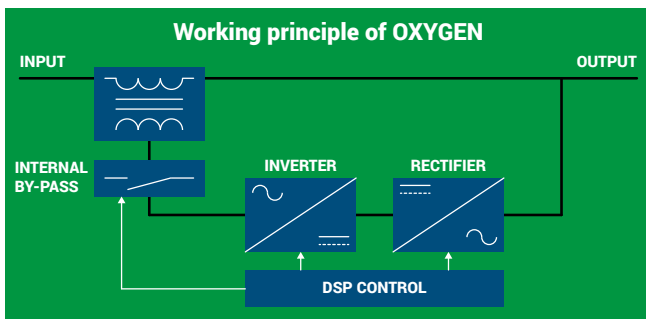
The use of the double conversion technology guarantees the insulation from the disturbances and the distortions of the network and, together with the help provided by the electrolytic capacitors, makes it possible to build machines for high power loads.

This SAG Compensator can operate with a load variation range for each phase from 0 to 100%, it is not affected by the power factor of the load and it can work with or without the neutral wire (on request).

Oxygen can operate with different input and, consequently, output voltage (380V or 415V) from the nominal one (400V).

The main components are:

- IGBT microcontroller-based electronic control boards running the system in terms of regulation and alarm management. They compare the output voltage value to the set one: if a difference is detected, they generate the compensation necessary to bring back the output voltage to the nominal value (provided that said difference falls in the working range).
- Conversion units (AC/DC rectifier and DC/AC inverter):
Rectifier: it converts the phase to neutral voltage of the AC mains into DC voltage by means of a fullycontrolled IGBT bridge. The rectifier is sized in order to supply the inverter at full load.
Inverter: it converts the DC voltage coming from the rectifier into AC voltage, stabilised in amplitude. The inverter uses the same IGBT technology as the rectifier.
- Internal by-pass static switch enabling load supply in case of fault condition.
- Buck/boost transformer adding or subtracting the voltage necessary to compensate for the mains fluctuation.
- Touch Display.



The user interface is created using a multilingual "touch panel" (10"); through the selection menu, it is possible to display electrical values and set the operating parameters. It is also possible to communicate with the electronic component via the RS485 serial bus using the Modbus protocol.

The standard cabinet is metallic with RAL9005 color and IP21 protection degree.

APPLICATIONS

Voltage SAGs and interruptions disturb many types of device connected to the network. They are the most frequent cause of power quality problems.

The most sensitive applications are:



ELECTRONICS INDUSTRY

Sensitive machinery, semiconductor.



FOOD & BEVERAGE

High speed bottling, packaging lines.



CONTINUOUS PRODUCTION LINES

Printing, steelworks, paper mills, petrochemicals, fibre and film, automotive.



MEDICAL

Sensitive medical equipment, Hospitals.



PHARMACEUTICAL

Packaging lines, continuous processes.



COMPUTER EQUIPMENT

Data processing centres, banks, telecommunication.

**SAG CORRECTION UP TO -50%
WITH CONTINUOUS ONLINE
REGULATION UP TO ±15%**
Correction in less than 3 milliseconds.

HIGH EFFICIENCY
>98% at nominal power.

INDUSTRIAL DESIGN
Designed for standard industrial loads with admitted overload as of 150% for 1 minute (at nominal input voltage).

MODULAR CONSTRUCTION
Fast & Easy maintenance.

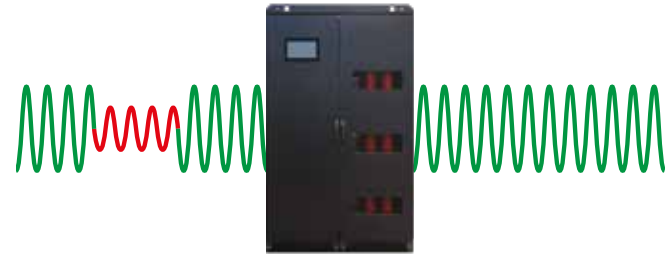
WITHOUT ENERGY STORAGE
Minimum maintenance and increased reliability.

INTERNAL BY-PASS
Internal by-pass static switch enabling load supply in case of fault condition.

CONNECTIVITY
Modbus TCP/IP.

**MULTILINGUAL TOUCH SCREEN
INTERFACE**
Easy to understand with simple user controls, events log.

KEY BENEFITS



Protection from the most common Power Quality problem.

Voltage SAGs are the most common cause of equipment malfunctions in automated industry. SAGs correction up to -50% for 1 min.

Economical solution: no maintenance and operation costs.

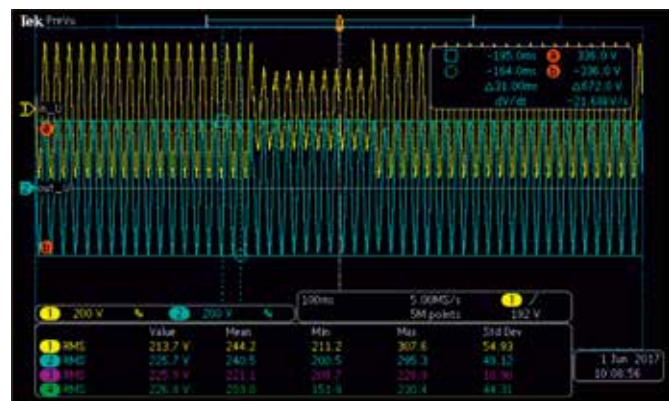
No battery energy storage required. Efficiency >98%.

Compared to a UPS...

Oxygen solution is specific for voltage SAGs with considerable benefits in terms of:

- Reduced cost.
- Less maintenance.
- Smaller footprint and occupied space.
- No specific climate room or air conditioning required.

Application example



■ Giallo: without Oxygen - ■ Blu: with Oxygen

TECHNICAL FEATURES

INPUT

| | |
|----------------------------|---|
| Available nominal voltage* | 380-400-415V (440-460-480V 60Hz only) |
| Maximum supply voltage | Max continuous voltage +10% |
| Frequency | 50Hz \pm 5% or 60Hz \pm 5% |
| Power system | 3 phases + N (no neutral wire on request) |

OUTPUT

| | |
|-------------------------|--|
| Voltage | The same of input nominal voltage (output voltage can be adjusted) |
| Admitted load variation | Up to 100% |
| Admitted load imbalance | 50% |
| Admitted overload | 150% for 1 minute (at nominal input voltage) |

PERFORMANCE

| | |
|-----------------------------|--|
| Efficiency | >98% |
| SAG correction response | <3 milliseccs |
| Output voltage accuracy | \pm 0,5% |
| SAG correction accuracy | \pm 4% |
| Continuous regulation range | Oxygen 10-40: \pm 10%, Oxygen 15-50: \pm 15% |

| SAG correction capability | Input | Output | Time |
|---------------------------|-------|--------|------------|
| Oxygen 10-40 | -40% | 100% | 1 minuto |
| | -50% | 90% | 45 secondi |
| | -60% | 80% | 36 secondi |
| Oxygen 15-50 | -50% | 100% | 1 minuto |
| | -60% | 90% | 45 secondi |

PROTECTION

| | |
|----------------------------|---|
| Internal automatic by-pass | Thyristor switch with capacity of 150% of model rating |
| Overvoltage protection | Class I input surge arrester / Class II output surge arrester |

BUCK/BOOST TRANSFORMER

| | |
|-----------|-----------------|
| Type | Dry transformer |
| Frequency | 50Hz or 60Hz |

ENVIRONMENT

| | |
|-----------------------------|--|
| Operating temperature range | 0°C to 40°C (32°F to 104°F) |
| Operating altitude | < 1000m without derating (for higher altitudes contact us) |
| Inverter cooling | Forced Ventilation |
| Transformer cooling | Natural convection |
| Max relative humidity | <95% (non-condensing) |
| Pollution degree rating | 2 |

* Output voltage can be adjusted by choosing one of the indicated values. Such choice sets the new nominal value as a reference for all the stabiliser parameters.

ENCLOSURE

| | |
|-------------------|---|
| Protection degree | IP2X (other on request) |
| Material | Electro-galvanized steel |
| Finish | Standard epoxy-polyester powder coating textured finish |
| Colour | RAL 9005 |
| Enclosure access | Hinged doors with key lock |

SERVICE

| | |
|-------------|--------------------------|
| Diagnostics | Non-volatile event & log |
|-------------|--------------------------|

USER INTERFACE

| | |
|--------------------|---|
| HMI | 10" colour touch panel, multilingual |
| Touch panel | Full parameters control, system & voltage event log |
| Remote duplication | On request by dedicated software connected to the same network (Ethernet) |
| Communication | Modbus TCP/IP |

POWER QUALITY EVENT MONITOR

| | |
|------------------|------------------------------------|
| Events recorded | Voltage SAG |
| Events detection | Input voltage |
| SAG threshold | Continuous (under minimum voltage) |

STANDARDS & CERTIFICATIONS

| | |
|-----------------|---------------|
| Quality | ISO9001 |
| Environmental | ISO14001 |
| Health & Safety | OHSAS18001 |
| Marking | CE |
| Performance | IEC 61439-1/2 |



All ORTEA equipments are designed and built in compliance with the Low Voltage and Electromagnetic Compatibility European Directives with regard to the CE marking requirements. ORTEA products are built with suitable quality components and that the manufacturing process is constantly verified in accordance with the Quality Control Plans which the Company applies in compliance with the ISO 9001 Standards. The commitment towards environmental issues and safety at work issues is guaranteed by the certification of the Management System according to the ISO14001 and OHSAS18001 Standards. In order to obtain better performance, the products described in the present document can be altered by the Company at any date and without prior notice. Technical data and descriptions therefore do not hold any contractual value.

OXYGEN RANGE

| Type | Rated power | Input voltage range | Max input current (peak) | Output voltage | Rated output current | Eff. | Correction time | Cabinet dimensions* | Weight* |
|------|-------------|---------------------|--------------------------|----------------|----------------------|------|-----------------|---------------------|---------|
| | [kVA] | [V] | [A] | [V] | [A] | [%] | [ms] | WxDxH [mm] | [kg] |

| Oxygen 10-40 input voltage compensation: $\pm 10\%$ continuous / -40% for 1 minute (100% nominal output voltage) | | | | | | | | | |
|---|------|---------|-------------|-----|------|-----|----|----------------|------|
| 200-10-40 | 200 | 360-440 | 321 (481) | 400 | 289 | >98 | <3 | 1200x800x2000 | 800 |
| 250-10-40 | 250 | 360-440 | 401 (601) | 400 | 361 | >98 | <3 | 1200x800x2000 | 900 |
| 320-10-40 | 320 | 360-440 | 513 (770) | 400 | 462 | >98 | <3 | 1200x800x2000 | 1150 |
| 400-10-40 | 400 | 360-440 | 642 (962) | 400 | 577 | >98 | <3 | 1200x1000x2200 | 1200 |
| 500-10-40 | 500 | 360-440 | 802 (1203) | 400 | 722 | >98 | <3 | 1200x1000x2200 | 1400 |
| 630-10-40 | 630 | 360-440 | 1010 (1516) | 400 | 909 | >98 | <3 | 2600x1400x2200 | 1600 |
| 800-10-40 | 800 | 360-440 | 1283 (1925) | 400 | 1155 | >98 | <3 | 2600x1400x2200 | 1800 |
| 1000-10-40 | 1000 | 360-440 | 1604 (2406) | 400 | 1443 | >98 | <3 | 4200x1000x2200 | 2100 |
| 1250-10-40 | 1250 | 360-440 | 2005 (3007) | 400 | 1804 | >98 | <3 | 4200x1000x2200 | 2300 |
| 1600-10-40 | 1600 | 360-440 | 2566 (3849) | 400 | 2309 | >98 | <3 | 4800x1400x2400 | 3200 |
| 2000-10-40 | 2000 | 360-440 | 3208 (4811) | 400 | 2887 | >98 | <3 | 4800x1400x2400 | 3600 |
| 2500-10-40 | 2500 | 360-440 | 4009 (6014) | 400 | 3609 | >98 | <3 | 4800x1400x2400 | 4000 |
| 3200-10-40** | 3200 | 360-440 | 5132 (7698) | 400 | 4619 | >98 | <3 | 4800x1400x2400 | 5000 |

| Oxygen 15-50 input voltage compensation: $\pm 15\%$ continuous / -50% for 1 minute (100% nominal output voltage) | | | | | | | | | |
|---|------|---------|-------------|-----|------|-----|----|----------------|------|
| 200-15-50 | 200 | 340-460 | 340 (577) | 400 | 289 | >98 | <3 | 1200x800x2000 | 1150 |
| 250-15-50 | 250 | 340-460 | 425 (722) | 400 | 361 | >98 | <3 | 1200x1000x2200 | 1200 |
| 320-15-50 | 320 | 340-460 | 543 (924) | 400 | 462 | >98 | <3 | 1200x1000x2200 | 1400 |
| 400-15-50 | 400 | 340-460 | 679 (1155) | 400 | 577 | >98 | <3 | 2600x1400x2200 | 1600 |
| 500-15-50 | 500 | 340-460 | 849 (1443) | 400 | 722 | >98 | <3 | 2600x1400x2200 | 1800 |
| 630-15-50 | 630 | 340-460 | 1070 (1819) | 400 | 909 | >98 | <3 | 2600x1400x2200 | 1900 |
| 800-15-50 | 800 | 340-460 | 1359 (2309) | 400 | 1155 | >98 | <3 | 4200x1000x2200 | 2300 |
| 1000-15-50 | 1000 | 340-460 | 1698 (2887) | 400 | 1443 | >98 | <3 | 4800x1400x2400 | 3200 |
| 1250-15-50 | 1250 | 340-460 | 2123 (3609) | 400 | 1804 | >98 | <3 | 4800x1400x2400 | 3600 |
| 1600-15-50 | 1600 | 340-460 | 2717 (4619) | 400 | 2309 | >98 | <3 | 4800x1400x2400 | 4000 |
| 2000-15-50** | 2000 | 340-460 | 3396 (5774) | 400 | 2887 | >98 | <3 | 4800x1400x2400 | 5000 |

The values listed in the tables are referred to 400V nominal voltage

* Size and Weight may change

** Available only for 480V / 60Hz

Optional accessories

Input automatic circuit breaker

Short circuit output protection

Manual maintenance by-pass

Input isolating transformer

EMI/RFI filters

OXYGEN K RANGE

| Type | Rated power | Input voltage range | Max input current (peak) | Output voltage | Rated output current | Eff. | Correction time | Cabinet dimensions* | Weight* |
|------|-------------|---------------------|--------------------------|----------------|----------------------|------|-----------------|---------------------|---------|
| | [kVA] | [V] | [A] | [V] | [A] | [%] | [ms] | LxPxH [mm] | [kg] |

| Oxygen 10-40 input voltage compensation: $\pm 10\%$ continuous / -40% for 1 minute (100% nominal output voltage) | | | | | | | | | |
|---|------|---------|-------------|-----|------|-----|----|----------------|------|
| 200-10-40K | 200 | 360-440 | 321 (481) | 400 | 289 | >98 | <3 | 1600x800x2000 | 925 |
| 250-10-40K | 250 | 360-440 | 401 (601) | 400 | 361 | >98 | <3 | 1600x800x2000 | 1025 |
| 320-10-40K | 320 | 360-440 | 513 (770) | 400 | 462 | >98 | <3 | 1600x800x2000 | 1275 |
| 400-10-40K | 400 | 360-440 | 642 (962) | 400 | 577 | >98 | <3 | 1800x1000x2200 | 1370 |
| 500-10-40K | 500 | 360-440 | 802 (1203) | 400 | 722 | >98 | <3 | 1800x1000x2200 | 1570 |
| 630-10-40K | 630 | 360-440 | 1010 (1516) | 400 | 909 | >98 | <3 | 3200x1400x2200 | 1800 |
| 800-10-40K | 800 | 360-440 | 1283 (1925) | 400 | 1155 | >98 | <3 | 3200x1400x2200 | 2000 |
| 1000-10-40K | 1000 | 360-440 | 1604 (2406) | 400 | 1443 | >98 | <3 | 4800x1000x2200 | 2300 |
| 1250-10-40K | 1250 | 360-440 | 2005 (3007) | 400 | 1804 | >98 | <3 | 5400x1000x2200 | 2930 |
| 1600-10-40K | 1600 | 360-440 | 2566 (3849) | 400 | 2309 | >98 | <3 | 6000x1400x2400 | 3840 |
| 2000-10-40K | 2000 | 360-440 | 3208 (4811) | 400 | 2887 | >98 | <3 | 6000x1400x2400 | 4300 |
| 2500-10-40K | 2500 | 360-440 | 4009 (6014) | 400 | 3609 | >98 | <3 | 6000x1400x2400 | 5000 |
| 3200-10-40K** | 3200 | 360-440 | 5132 (7698) | 400 | 4619 | >98 | <3 | 6800x1400x2400 | 6200 |

| Oxygen 15-50 input voltage compensation: $\pm 15\%$ continuous / -50% for 1 minute (100% nominal output voltage) | | | | | | | | | |
|---|------|---------|-------------|-----|------|-----|----|----------------|------|
| 200-15-50K | 200 | 340-460 | 340 (577) | 400 | 289 | >98 | <3 | 1600x800x2000 | 1275 |
| 250-15-50K | 250 | 340-460 | 425 (722) | 400 | 361 | >98 | <3 | 1800x1000x2200 | 1325 |
| 320-15-50K | 320 | 340-460 | 543 (924) | 400 | 462 | >98 | <3 | 1800x1000x2200 | 1525 |
| 400-15-50K | 400 | 340-460 | 679 (1155) | 400 | 577 | >98 | <3 | 3200x1400x2200 | 1770 |
| 500-15-50K | 500 | 340-460 | 849 (1443) | 400 | 722 | >98 | <3 | 3200x1400x2200 | 2000 |
| 630-15-50K | 630 | 340-460 | 1070 (1819) | 400 | 909 | >98 | <3 | 3200x1400x2200 | 2100 |
| 800-15-50K | 800 | 340-460 | 1359 (2309) | 400 | 1155 | >98 | <3 | 4800x1000x2200 | 2500 |
| 1000-15-50K | 1000 | 340-460 | 1698 (2887) | 400 | 1443 | >98 | <3 | 6000x1400x2400 | 3830 |
| 1250-15-50K | 1250 | 340-460 | 2123 (3609) | 400 | 1804 | >98 | <3 | 6000x1400x2400 | 4240 |
| 1600-15-50K | 1600 | 340-460 | 2717 (4619) | 400 | 2309 | >98 | <3 | 6000x1400x2400 | 4650 |
| 2000-15-50K** | 2000 | 340-460 | 3396 (5774) | 400 | 2887 | >98 | <3 | 6000x1400x2400 | 5730 |

The values listed in the tables are referred to 400V nominal voltage

* Size and Weight may change

** Available only for 480V / 60Hz

Compared to the standard model, the K model is equipped with:

- Input automatic circuit breaker
- Output automatic circuit breaker
- Manual by-pass line with interlocked automatic circuit breaker

Optional accessories

- Input isolating transformer
- EMI/RFI filters

