

Voltage Stabilisers



Founded in 1969, ORTEA SpA is a leading company in manufacturing and engineering voltage stabilisers and magnetic components.

Over forty years in the business and ongoing technical research have made of ORTEA a competitive and technologically advanced company. Close co-operation between design, production and marketing enables to meet the requirements of a constantly growing number of customers.

In 1996 ORTEA joined ICAR Group, made of Italian and European industrial units specialised in manufacturing capacitors and power factor correction systems.

Beside standard production, ORTEA can be extremely flexible in developing and manufacturing special equipment according to User's specification. All this thanks to the experience gained over many years of applied technological development.

Such development includes IT tools that enable the technical staff to elaborate electrical and mechanical designs for each «custom product» on a quick and cost-effective basis.

The belief that product quality and Customer satisfaction are the core of a modern organisation, led to the implementation of an ISO9001:2008 certified Company Managing System. The achievement of the ISO14001:2004 and OHSAS18001:2007 accreditation was a natural integration in order to optimise the Company's performance, showing at the same time the commitment towards environmental and safety at work issues.



ISO 9001 • ISO 14001
OHSAS 18001





ORTEA is well established in the global market. Thanks to strategically positioned offices and distributors and efficient commercial relations, ORTEA's products are installed and working in a large number of countries.



- ▲ ORTEA headquarters (Italy)
- ▲ ORTEA branches (Russia, Ivory Coast, Kenya, Venezuela)



Experience.

In its **over 45 years** of business, Ortea (founded in 1969) has gained **experience** and **know-how** that enabled continuous growth and evolution. This never-ending process has allowed the Company to assume a **leading role worldwide** in designing and manufacturing voltage stabilisers.



Reliability.

Thanks also to its long-established **Quality System**, ORTEA can ensure the production of **reliable** and **long lasting products**, each one of them accurately **tested**.



Flexibility.

In addition to the standard production, ORTEA's extremely flexible organization is able to develop and manufacture **cost-effective special equipment** based on the Customer's specification.



Speed.

ORTEA can manage the purchasing orders **very quickly**. Review of offer/order, design, production planning, manufacturing and strict test routines: all the **processes** have been **analysed** and **optimised** in order to eliminate idle time and shorten delivery terms.



Research & Development.

ORTEA invests a **considerable amount** in **R&D** concerning new products and technology. It is acknowledged that modern challenges in a globalised and competitive market can be won only when you're «ahead of time».



Synergy.

Co-operation between Headquarters, Subsidiaries, Distributors and Customers aimed at a careful **analysis of markets** and **demand** enable ORTEA the development of **up-to-date products**.

By working together, marketing, design, production and after-sales service allow the Company to meet the necessities set forth by an increasingly **globalised** and competitive **market**.



After-sales.

The **continuous monitoring** and **analysis** of requests and claims carried out by the after-sales service enables the **improvement** the **quality** of both **products** and **service** to the Customer.

ORTEA after-sales organization can act **quickly**, providing for precise issue analysis, supply of advise and **know-how** and, if necessary, provision of **spare parts** in order to solve any anomaly.



Quality.

Aiming at providing for the **best quality**, the manufacturing process includes checks during production and detail test sessions for each stabiliser.

The approved Integrated Managing System ensures the control of every manufacturing phase, starting from checking the components at reception and ending with the best package in relation to the transport type.

The Integrated Managing System is **ISO9001:2008** – **ISO14001:2004** – **OHSAS18001:2007** approved.

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The issue

Electrical devices are designed to work in distributing systems defined by set **nominal values** in terms of voltage and frequency (for example, 400V at 50Hz).

In actual fact, electric energy distribution **might not ensure the stability** of said nominal parameters. Voltage in particular can **vary** even considerably in relation to the nominal value. These variation can cause **undesired** and **potentially dangerous conditions** for the users.

Voltage 'fluctuations' can be 'fast' and waste themselves away in a few milliseconds (for example, distribution lines hit by lightning) or 'slow', with duration that can last several seconds, minutes or even hours depending on the cause.

Slow fluctuations can be generated by increased voltage level ('surge' due to poor MV regulation at distribution level, disconnection of large loads, overvoltage at generators output, etc) or – more frequently – by decreased voltage level ('sags' due to connection of large loads, motor startup, undersized distribution lines, faults to ground, poor MV voltage regulation, etc).

In case of voltage variation, the **voltage stabiliser** is the **solution** that guarantees for **the best cost/benefit ratio**.

The continuous availability of **stable voltage supply** independently from input fluctuation is very often a key feature to ensure **efficiency** and **reliability** for the User.

Reduced productivity, data loss, security failure, machine faults, inaccurate information and domestic inconveniences are only a few examples of potential problems caused by unsteady supply. Obviously, all that results in higher managing cost.

The solution

The **voltage stabiliser** has proven to be an effective solution able to prevent potentially dangerous situations created by input voltage instability.

The main application fields where devices sensitive to voltage variations can be used include:

- **Industrial sector:** oil & gas, laser cutting, water shearing, tobacco industry, textile industry, galvanic processes, machinery in general.
- **Food & Beverage:** industry, intensive breeding, food processing, packaging, bottling.
- **Tertiary & servicing:** banks, hotels & tourist resorts, data centre, laboratories, small businesses, private users.
- **Telecommunications:** TV/Radio stations, telecom networks.
- **Public sector:** hospitals, public offices & institutions.
- **Renewable sources:** solar and wind farms.

In all these applications, voltage fluctuation, even though within the tolerance admitted by the Standards, can generate **operating issues**. In that case, devices particularly sensitive can show errors or malfunctions beyond the acceptable limit.

Typical situations where voltage can be subject to fluctuation beyond the admitted tolerance are:

- Loads supplied by weak or undersized distributing lines (rural areas or locations supplied by long distributing lines such as breeding farms, tourist resorts, hotels, etc).
- Users located near distributing station and therefore subject to voltage increase.
- Private premises with high power installations (swimming pool pumps, big chillers, special lighting systems, lifts) and/or particularly voltage sensitive loads (high power consumer electronics, etc.).
- Loads located near large industrial plants where individual high power devices (MV motors) can induce voltage reduction at startup.
- Island operating loads (ships, offshore rigs, loads not connected to the public grid).

In comparison to other types of equipment, the **voltage stabiliser** offers a number of advantages that very often make it the **optimum solution**:

- Usually lower price.
- High output voltage stability guaranteed even for wide input fluctuation.
- Absence of introduced harmonic distortion.
- Robust and reliable construction, allowing for use in hard environments.
- Overload capability up to twice the rated current (max 2 mins).
- No concerns in terms of storage, transportation, maintenance and disposal due to the fact that batteries are not used.
- Smooth and reliable regulation of the load voltage ensuring a $\pm 0.5\%$ accuracy even with important input voltage variation.
- High efficiency.
- High inrush current withstand capability.
- Reduced dimension, simple to run, 'plug&play' operating mode.



Design criteria

A **voltage stabiliser** is a power device destined to be positioned between the mains and the User. The purpose is to ensure that the User is fed a voltage subject to a variation much lower ($\pm 0.5\%$ with regards to the nominal value) than the one guaranteed by the distributing system.

The **stabilization** is performed on the «**true rms**» voltage and it is not affected by harmonics in the mains. Due to the fact that the regulation does not involve any intervention on the sinewave, **neither an appreciable harmonic distortion nor a phase displacement is introduced** on the downstream line.

The stabiliser **is not affected by the load power factor** ($\cos \varphi$) and can operate **with a load percentage varying between 0% and 100% on each phase**. **Regulation speed** depends on the input voltage variation percentage and on the type of construction. Indicatively, said speed ranges between 8 and 30 millise/V. Basically, a voltage stabiliser is made of a **buck/boost transformer**, a **voltage regulator** and an **electronic control**. Based on a **microprocessor** that samples at high frequency the output voltage, the control system drives the regulator gearmotor. By doing so, the regulator rollers change their position and therefore the voltage drawn and supplied to the buck/boost transformer primary winding. Being the secondary voltage of the buck/boost transformer in phase or in opposition to the supply, the voltage drawn from the regulator is added or subtracted to the mains voltage, thus compensating its variations. The voltage regulator is nothing but an **autotransformer with continuously variable transformer ratio**. Depending on the stabiliser power, the regulator can be either **toroidal** or **columnar**.

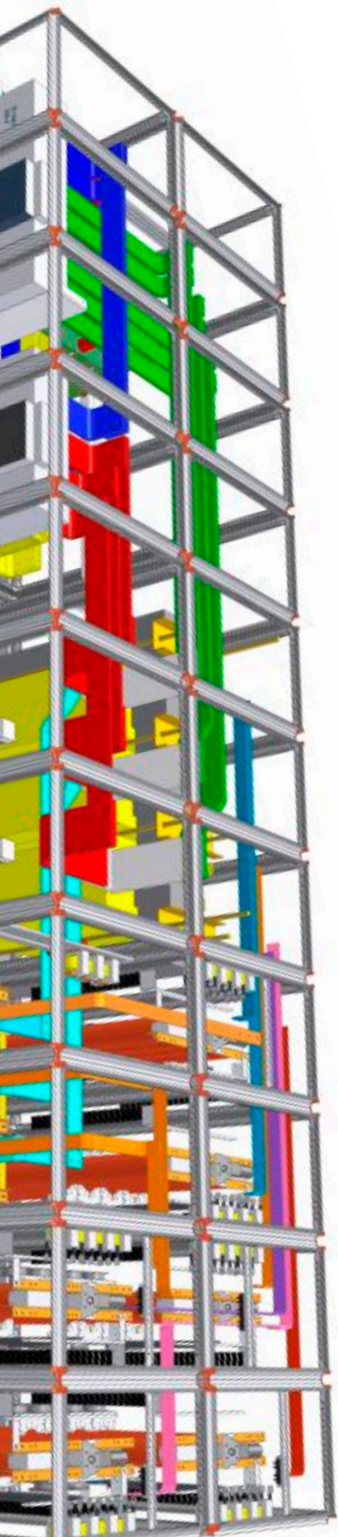
The stabilisers are designed and built in compliance with the European Directives concerning CE marking (Low Voltage and Electromagnetic Compatibility Directives).

Standard units are housed in an IP21 metallic enclosure RAL7035 painted. Cooling is guaranteed by natural air circulation aided by extracting fans over a certain temperature.

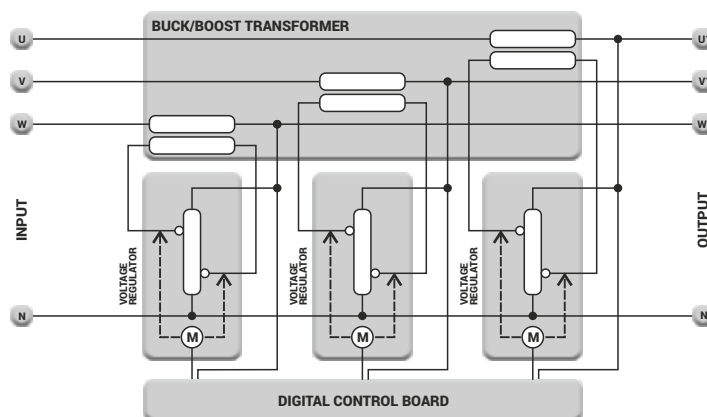
The voltage stabiliser operating nominal voltage can be chosen from values (generally included in the range 380V / 415V). Such setting can be performed at the factory or at the Customer's premises according to the instructions given in the reference technical handbook.

On Sirius and Sirius Advance stabilisers, the output voltage reference and the main configuration parameters can be set in different ways:

- through the local LCD display;
- directly by communicating with the microprocessor via a PC connection (through RS232 and USB interfaces);
- from a remote station (via Ethernet, GPRS modem or MODBUS TCP/IP protocol).



Working principle of an electro-mechanical digital voltage stabiliser



Main components

1. Buck/boost transformer

Often referred to as 'booster' transformer, it is a standard dry-type transformer with the secondary winding connected in series to the mains and the primary winding supplied by the voltage regulator.

2. Voltage regulator

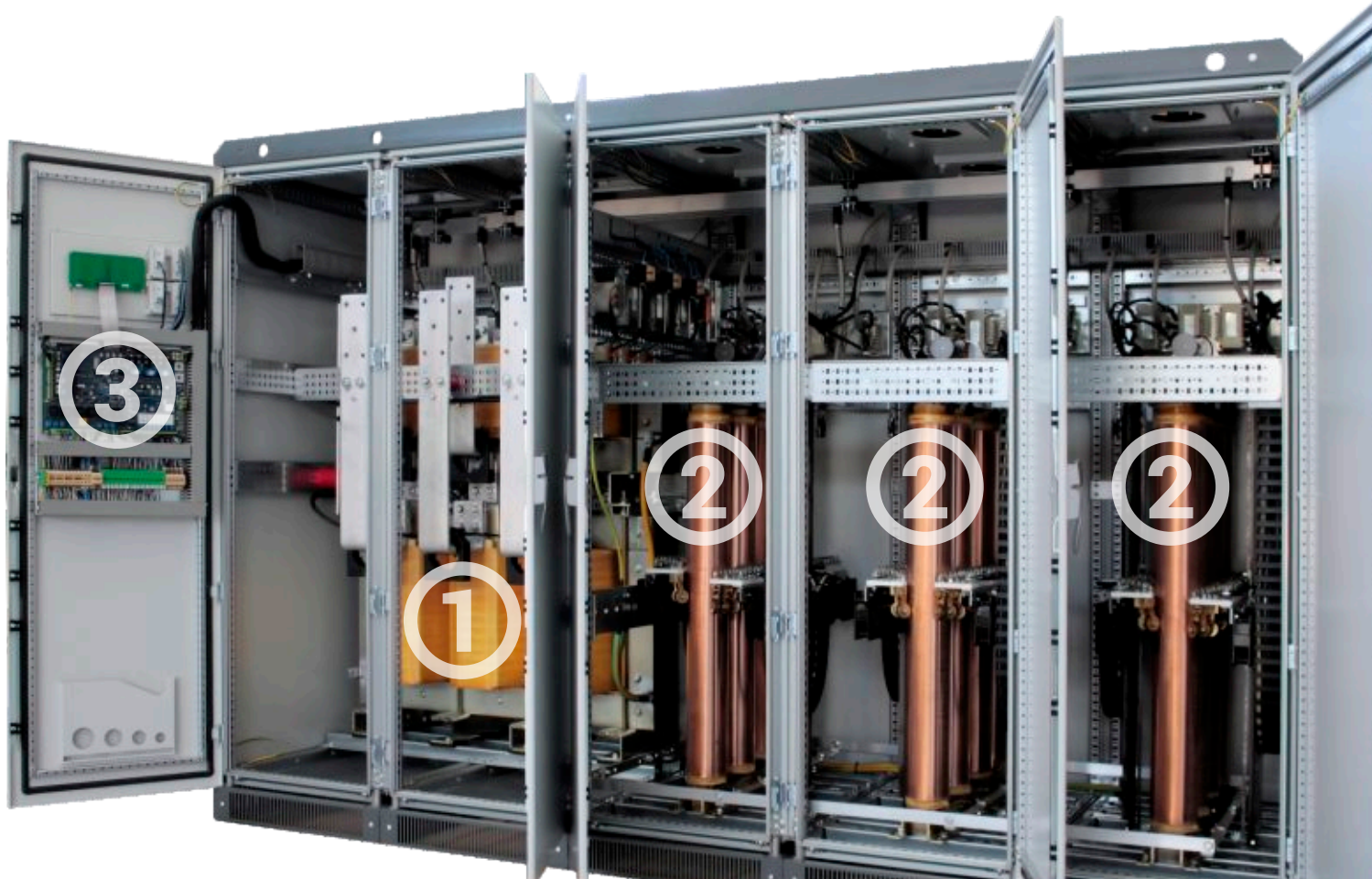
Basically, it is an autotransformer with continuously variable transformer ratio. The voltage intake varies depending on the position of the rolling contacts; therefore the voltage supplied to the booster transformer primary winding also varies. Being the voltage across the regulator contacts (and consequently that on the secondary winding of the booster transformer) either in phase or in opposition to the supply voltage, it is then added or subtracted to the supply voltage, thus compensating its variations.

3. Auxiliary circuit with microprocessor

The DSP (Digital Signal Processor) microprocessor-based control circuit (specifically designed for drives with totally digitalised signal) compares the output voltage value to the reference one sampling it 2000 times per second.

When an anomaly is detected, the control drives the voltage regulator gearmotor. By doing so, the regulator rollers change their position thus varying the voltage drawn and supplied to the buck/boost transformer primary winding. The input voltage variation is therefore automatically compensated.

The control system operates so that the output accuracy is $\pm 0.5\%$. The microprocessor is fitted with the soft stop function enabling a precise positioning of the regulator rollers regulation to work smoothly even in case of strong fluctuation of the input voltage.



Criteria for choosing the right type

Number of phases

The number of phases of a stabiliser depends on the type of load:

- single-phase load: single-phase stabiliser;
- combination of several single-phase loads on the same line: three-phase stabiliser or a single-phase stabiliser on each load;
- three-phase load: three-phase stabiliser.

Rated voltage

Due to the fact that the nominal voltage varies internationally, establish the rated voltage required at the stabiliser input and output. In case of three-phase systems, provide with the line-to-line voltage value. The standard voltage stabiliser can operate with:

- frequency 50Hz: nominal voltage 380V-400V-415V;
- frequency 60Hz: nominal voltage 440V-460V-480V.

Input variation range

It's key information for the choice and the design of the stabiliser.

Establish the amplitude of the oscillation of the input voltage and always keep a safety margin on such percentage: for example, if the measured fluctuation is $\pm 16\%$, then choose a stabiliser suitable for $\pm 20\%$ variation.

Note: if the input variation exceeds the nominal one, the difference is added to the output precision. For example, if a stabiliser designed for $\pm 15\%$ input variation receives a $+20\%$ voltage, the output precision shall not be $\pm 0.5\%$ but $\pm 5.5\%$.

Type of regulation

The three-phase voltage stabilisers perform an independent regulation on each phase. The connection to the distributing line neutral wire is mandatory.

Should the neutral wire not be available, a specific accessory component must be added.

For special applications, three-phase stabilisers regulating the average value of the three output voltages are also available on request.

Rated power

All the stabilisers are designed for the maximum input current, but it is advisable to consider an extra safety margin for possible future expansions.

In a voltage stabiliser, the power is expressed in kVA, whilst the load power is usually expressed in kW. Remember that the link between these two measuring units is provided by the power factor ($\cos \varphi$): $\text{kVA} = \text{kW} / \cos \varphi$

Also, remember that if the power factor and/or the load power in kW cannot be easily established, measure the absorbed currents in order to allow for a correct design of the stabiliser and keeping in mind that:

$\text{kVA (1-ph.)} = \text{load voltage} \times \text{load current}$

$\text{kVA (3-ph.)} = \sqrt{3} \times \text{phase to phase load voltage} \times \text{load current}$

Installation

Choose the other characteristics of the stabiliser considering the installation conditions.

The following aspect must be known:

- IP protection degree required.
- Indoor or outdoor installation.
- Site altitude and climatic characteristics.
- Ambient temperature.
- Possible environmental hazards such as aggressive atmosphere, exposure to chemical components and so on.

Accessories

A standard voltage stabiliser can be enriched with a number of accessories:

- Interruption and protection devices.
- Load protection against over/undervoltage.
- Bypass line.
- Input isolating transformer.
- Total protection kit.
- Surge arrestor (SPD).
- Integrated automatic power factor correction system.
- EMI/RFI filter.
- Neutral point reactor.
- Up to IP54 protection degree for both indoor and outdoor installation.

Special construction

By means of some modifications, it is possible to obtain special stabilisers able to:

- deal with asymmetrical input voltage variation (for example, from -25% to $+10\%$ of the nominal voltage);
- deliver an output voltage different from the input one (for example, $V_{in} = 400V \pm 15\%$, $V_{out} = 460V \pm 0.5\%$).

Electro-mechanical digital voltage stabilisers

Vega	Single-phase	0.3-25kVA
Antares	Single-phase	15-135kVA
Orion	Three-phase	2-250kVA
Orion plus	Three-phase	30-1250kVA
Sirius	Three-phase	60-6000kVA
Sirius advance	Three-phase	60-4000kVA

	Single-phase		Three-phase			
	Vega	Antares	Orion	Orion plus	Sirius	Sirius advance
Output accuracy $\pm 0,5\%$	✓	✓	✓	✓	✓	✓
Regulator rolling contacts	✓	✓	✓	✓	✓	✓
Toroidal regulator	✓	up to 80kVA	✓	up to 250kVA	x	x
Columnar regulator	x	from 100kVA	x	from 300kVA	✓	✓
Control electronic board	✓	✓	✓	✓	✓	✓
Remote communication board	x	x	x	x	✓	✓
Local display	✓	x	x	x	✓	✓
Alarm signal code	LCD Display	LED (board)	LED (board)	x	x	x
External alarm LEDs	x	x	x	✓	✓	✓
External phase indication LEDs	x	x	x	✓	✓	✓
Acoustic alarm	✓	✓	✓	✓	✓	✓
USB connection	x	x	x	from 300kVA	✓	✓
RS232 connection	x	from 100kVA	●	✓	x	x
GPRS modem connection	x	x	x	x	✓	✓
Ethernet connection	x	x	x	x	✓	✓
MODBUS TCP/IP protocol	x	x	x	x	✓	✓
Maintenance required signal	x	x	x	✓	✓	✓
Regulator protection (magneto-thermal)	✓	✓	✓	up to 250kVA	x	x
Regulator protection (electronic)	x	x	x	from 300kVA	✓	✓
Varistor protection	✓	✓	up to 45kVA	x	x	x
Overvoltage protection SPD cl. I	●	●	●	●	✓	✓
Overvoltage protection SPD cl. II	●	●	from 60kVA	✓	✓	✓
Digital voltmeter	✓	x	x	x	x	x
Multimetre / Line analyser	x	✓	✓	✓	✓	✓
Air conditioning cooling	x	●	●	●	●	●
Load variation up to 100%	✓	✓	✓	✓	✓	✓
Overload up to 200% for 2 mins.	✓	✓	✓	✓	✓	✓
Harmonic distortion	none introduced	none introduced	none introduced	none introduced	none introduced	none introduced
IP21 degree protection	✓	✓	✓	✓	✓	✓
Protection degree other than IP21	●	●	●	●	●	●
Indoor installation	✓	✓	✓	✓	✓	✓
Outdoor installation	●	●	●	●	●	●
Ambient temperature	-25/+45°C	-25/+45°C	-25/+45°C	-25/+45°C	-25/+45°C	-25/+45°C
Storage temperature	-25/+60°C	-25/+60°C	-25/+60°C	-25/+60°C	-25/+60°C	-25/+60°C
Max relative humidity	95%	95%	95%	95%	95%	95%

✓ standard
x not available
● optional



Vega



single-phase
0.3-25kVA

Standard features

Selectable output voltage (dip-switch)*	220-230-240V
Frequency	50/60Hz $\pm 5\%$
Admitted load variation	Up to 100%
Cooling	Natural ventilation
Ambient temperature	-25/+45°C
Storage temperature	-25/+60°C
Max relative humidity	95%
Admitted overload	200% 2 min.
Harmonic distortion	None introduced
Colour	RAL 7035
Protection degree	IP21
Instrumentation	Output digital voltmeter
Installation	Indoor

* The 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.

Accessories

Interrupting devices
Load protection against over/undervoltage
Manual by-pass line
Input isolating transformer
SPD surge arrestor
EMI/RFI filters
IP54 protection degree for indoor and outdoor installation

Rating in relation to the input variation percentage

$\pm 15\%$	$\pm 20\%$	$\pm 25\%$	$\pm 30\%$	$+15\%/-25\%$	$+15\%/-35\%$	$+15\%/-45\%$
1	0.7	0.5	0.3	0.7	0.5	0.3
2.5	2	1.5	1	2	1.5	1
5	4	3	2	4	3	2
7	5	4	3	5	4	3
10	7	5	4	7	5	4
15	10	7	5	10	7	5
20	15	10	7	15	10	7
25	20	15	10	20	15	10



All ORTEA stabilisers 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 9001:2008 Standards. The commitment towards environmental issues and safety at work matters is guaranteed by the certification of the Management System according to the ISO14001:2004 and OHSAS18001:2007 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 do hold therefore any contractual value.

Vega single-phase 0.3-25kVA

Vega stabilisers are available for different ranges of input voltage fluctuation.

Standard models offer a **double input connection** so that with the same unit two different input variations ($\pm 15/\pm 20\%$ or $\pm 25/\pm 30\%$) can be dealt with.

An **automatic circuit breaker** is mounted on the regulation circuit **to protect** against overload and short circuit on the voltage regulator, whilst the auxiliary circuit is protected by **fuses**.

A **digital display** on the front panel shows the output voltage and the alarms (min/max output voltage, gearmotor lock, internal overheating, regulator overload)

The control logic is based on a digital **microprocessor**.

All Vega stabilisers are fitted with the **same control card**, thus simplifying maintenance operations and spare parts storage.



Wide range

- symmetrical: **$\pm 15\%$, $\pm 20\%$, $\pm 25\%$, $\pm 30\%$** (other on request)
 - asymmetrical: **$+15\%/-25\%$, $+15\%/-35\%$, $+15\%/-45\%$** (other on request)
- Output voltage accuracy: **$\pm 0.5\%$** .



Technology

Control logic based on digital **microprocessor** operating with a software specifically developed for Ortea.



Long life

Ortea system voltage regulator with **rollers** (without brushes, which are subject to heavy wear & tear).



Protection

The voltage regulator is protected by a **circuit breaker** with magneto thermal release.
The auxiliary circuit is protected by **fuses**.



Instrumentation

A **digital display** providing with output voltage and alarm readings is fitted on the front panel.

Vega

single-phase
0.3-25kVA

Type	Input voltage variation range	Rating	Input voltage range	Maximum input current	Output voltage $\pm 0.5\%$	Output current	Efficiency	Speed regulation	Cabinet	Weight
	[%]	[kVA]	[V]	[A]	[V]	[A]	[%]	[ms/V]	Type	[kg]

Input voltage variation range $\pm 20\%/\pm 15\%$ (the values listed in the table are referred to 230V nominal voltage)

0.7-20	± 20	0.7	184-276	3.8		3		12		
1-15	± 15	1	195-265	5	230	4.3	>96	16	12	16
2-20	± 20	2	184-276	11		8.7		12		
2.5-15	± 15	2.5	195-265	13	230	11	>96	16	12	24
4-20	± 20	4	184-276	21		17		12		
5-15	± 15	5	195-265	26	230	22	>96	16	12	28
5-20	± 20	5	184-276	28		22		12		
7-15	± 15	7	195-265	35	230	30	>98	16	13	41
7-20	± 20	7	184-276	38		30		12		
10-15	± 15	10	195-265	51	230	43	>98	16	13	47
10-20	± 20	10	184-276	54		43		12		
15-15	± 15	15	195-265	76	230	65	>98	16	13	55
15-20	± 20	15	184-276	81		65		12		
20-15	± 15	20	195-265	102	230	87	>98	16	22	92
20-20	± 20	20	184-276	109		87		12		
25-15	± 15	25	195-265	128	230	109	>98	16	22	115

Input voltage variation range $\pm 30\%/\pm 25\%$ (the values listed in the table are referred to 230V nominal voltage)

0.3-30	± 30	0.3	161-300	1.9		1.3		8		
0.5-25	± 25	0.5	172-288	2.9	230	2.2	>96	10	12	16
1-30	± 30	1	161-300	6.2		4.3		8		
1.5-25	± 25	1.5	172-288	8.7	230	6.5	>96	10	12	24
2-30	± 30	2	161-300	12		8.7		8		
3-25	± 25	3	172-288	17	230	13	>96	10	12	28
3-30	± 30	3	161-300	19		13		8		
4-25	± 25	4	172-288	23	230	17	>98	10	13	41
4-30	± 30	4	161-300	25		17		8		
5-25	± 25	5	172-288	29	230	22	>98	10	13	47
5-30	± 30	5	161-300	31		22		8		
7-25	± 25	7	172-288	40	230	30	>98	10	13	56
7-30	± 30	7	161-300	44		30		8		
10-25	± 25	10	172-288	57	230	43	>98	10	22	92
10-30	± 30	10	161-300	62		43		8		
15-25	± 25	15	172-288	87	230	65	>98	10	22	115

Vega

single-phase
0.3-25kVA

Type	Input voltage variation range	Rating	Input voltage range	Maximum input current	Output voltage $\pm 0.5\%$	Output current	Efficiency	Speed regulation	Cabinet	Weight
	[%]	[kVA]	[V]	[A]	[V]	[A]	[%]	[ms/V]	Type	[kg]

Input voltage variation range **+15%/-25%** (the values listed in the table are referred to 230V nominal voltage)

0.7-15/25	+15/-25	0.7	172-265	4	230	3	>96	12	12	17
2-15/25	+15/-25	2	172-265	12	230	8.7	>96	12	12	25
4-15/25	+15/-25	4	172-265	23	230	17	>96	12	12	29
5-15/25	+15/-25	5	172-265	29	230	22	>98	12	13	42
7-15/25	+15/-25	7	172-265	40	230	30	>98	12	13	48
10-15/25	+15/-25	10	172-265	57	230	43	>98	12	13	56
15-15/25	+15/-25	15	172-265	87	230	65	>98	12	22	92
20-15/25	+15/-25	20	172-265	116	230	87	>98	12	22	115

Input voltage variation range **+15%/-35%** (the values listed in the table are referred to 230V nominal voltage)

0.5-15/35	+15/-35	0.5	150-265	3.4	230	2.2	>96	10	12	17
1.5-15/35	+15/-35	1.5	150-265	10	230	6.5	>96	10	12	25
3-15/35	+15/-35	3	150-265	20	230	13	>96	10	12	29
4-15/35	+15/-35	4	150-265	26	230	17	>98	10	13	42
5-15/35	+15/-35	5	150-265	34	230	22	>98	10	13	48
7-15/35	+15/-35	7	150-265	46	230	30	>98	10	13	56
10-15/35	+15/-35	10	150-265	66	230	43	>98	10	22	92
15-15/35	+15/-35	15	150-265	100	230	65	>98	10	22	115

Input voltage variation range **+15%/-45%** (the values listed in the table are referred to 230V nominal voltage)

0.3-15/45	+15/-45	0.3	126-265	2.4	230	1.3	>96	8	12	17
1-15/45	+15/-45	1	126-265	7.8	230	4.3	>96	8	12	25
2-15/45	+15/-45	2	126-265	16	230	8.7	>96	8	12	29
3-15/45	+15/-45	3	126-265	24	230	13	>98	8	13	42
4-15/45	+15/-45	4	126-265	31	230	17	>98	8	13	48
5-15/45	+15/-45	5	126-265	40	230	22	>98	8	13	56
7-15/45	+15/-45	7	126-265	55	230	30	>98	8	22	92
10-15/45	+15/-45	10	126-265	78	230	43	>98	8	22	115



Antares

single-phase
15-135kVA



Standard features

Selectable output voltage (dip-switch)*	220-230-240V
Frequency	50/60Hz $\pm 5\%$
Admitted load variation	Up to 100%
Cooling	Natural ventilation (aided with fans)
Ambient temperature	-25/+45°C
Storage temperature	-25/+60°C
Max relative humidity	95%
Admitted overload	200% 2 min.
Harmonic distortion	None introduced
Colour	RAL 7035
Protection degree	IP21
Instrumentation	Output digital multimeter
Installation	Indoor
Overvoltage protection	Class II output surge arrestor

* The 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.

Accessories

Interrupting devices
Load protection against over/undervoltage
Manual by-pass line
Input isolating transformer
SPD surge arrestor
EMI/RFI filters
IP54 protection degree for indoor and outdoor installation

Rating in relation to the input variation percentage

$\pm 15\%$	$\pm 20\%$	$\pm 25\%$	$\pm 30\%$	+15%/-25%	+15%/-35%	+15%/-45%
35	25	20	15	25	20	15
45	35	25	20	35	25	20
60	45	35	25	45	35	25
80	60	45	35	60	45	35
100	80	60	45	80	60	45
135	100	80	60	100	80	60



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Antares single-phase 15-135kVA

Antares stabilisers are available for different ranges of input voltage fluctuation.

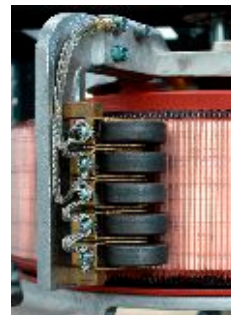
Standard models offer a **double input connection** so that with the same unit two different input variations ($\pm 1.5\%$ / $\pm 20\%$ or $\pm 25\%$ / $\pm 30\%$) can be dealt with.

An **automatic circuit breaker** is provided on the regulation circuit **to protect** against overload and short circuit on the voltage regulator whilst the auxiliary circuit is protected by **fuses**.

The instrumentation consists of a **digital multimeter** installed on the cabinet front panel. The alarms (min/max output voltage, gearmotor lock, internal overheating, regulator overload) are recognizable by means of LEDs on the control card.

The control logic is based on a digital **microprocessor**.

All Antares stabilisers are fitted with the **same control card**, thus simplifying maintenance operations and spare parts storage.



Wide range

- symmetrical: **$\pm 15\%$, $\pm 20\%$, $\pm 25\%$, $\pm 30\%$** (other on request)
 - asymmetrical: **$+15\%/-25\%$, $+15\%/-35\%$, $+15\%/-45\%$** (other on request)
- Output voltage accuracy: **$\pm 0.5\%$** .



Technology

Control logic based on digital **microprocessor** operating with a software specifically developed for Ortea.



Long life

Ortea system voltage regulator with **rollers** (without brushes, which are subject to heavy wear & tear).



Protection

The voltage regulator is protected by a **circuit breaker** with magneto thermal release.
The auxiliary circuit is protected by **fuses**.
Overvoltage protection: Class II output **surge arrestor**.



Instrumentation

The digital measuring instrumentation is installed on the front panel and consist of an output **digital multimeter**.

Antares

single-phase
15-135kVA

Type	Input voltage variation range	Rating	Input voltage range	Maximum input current	Output voltage $\pm 0.5\%$	Output current	Efficiency	Speed regulation	Cabinet	Weight
	[%]	[kVA]	[V]	[A]	[V]	[A]	[%]	[ms/V]	Type	[kg]

Input voltage variation range **$\pm 20\%/ \pm 15\%$** (the values listed in the table are referred to 230V nominal voltage)

25-20	± 20	25	184-276	136	230	109	>98	12 16	23	180
35-15	± 15	35	195-265	179	230	152	>98	12 16	31	200
35-20	± 20	35	184-276	190	230	152	>98	12 16	40	320
45-15	± 15	45	195-265	230	230	196	>98	12 16	51	550
45-20	± 20	45	184-276	245	230	196	>98	12 16	51	650
60-15	± 15	60	195-265	307	230	261	>98	12 16		
60-20	± 20	60	184-276	326	230	261	>98	12 16		
80-15	± 15	80	195-265	409	230	348	>98	12 16		
80-20	± 20	80	184-276	435	230	348	>98	12 16		
100-15	± 15	100	195-265	511	230	435	>98	12 16		
100-20	± 20	100	184-276	544	230	435	>98	12 16		
135-15	± 15	135	195-265	690	230	587	>98	12 16		

Input voltage variation range **$\pm 30\%/ \pm 25\%$** (the values listed in the table are referred to 230V nominal voltage)

15-30	± 30	15	161-300	93	230	65	>98	8 10	23	180
20-25	± 25	20	172-288	116	230	87	>98	8 10	31	200
20-30	± 30	20	161-300	124	230	87	>98	8 10	40	320
25-25	± 25	25	172-288	145	230	109	>98	8 10	40	390
25-30	± 30	25	161-300	156	230	109	>98	8 10	51	550
35-25	± 25	35	172-288	203	230	152	>98	8 10	51	650
35-30	± 30	35	161-300	217	230	152	>98	8 10		
45-25	± 25	45	172-288	261	230	196	>98	8 10		
45-30	± 30	45	161-300	279	230	196	>98	8 10		
60-25	± 25	60	172-288	348	230	261	>98	8 10		
60-30	± 30	60	161-300	373	230	261	>98	8 10		
80-25	± 25	80	172-288	464	230	348	>98	8 10		

Antares

single-phase
15-135kVA

Type	Input voltage variation range	Rating	Input voltage range	Maximum input current	Output voltage $\pm 0.5\%$	Output current	Efficiency	Speed regulation	Cabinet	Weight
	[%]	[kVA]	[V]	[A]	[V]	[A]	[%]	[ms/V]	Type	[kg]

Input voltage variation range **+15%/-25%** (the values listed in the table are referred to 230V nominal voltage)

25-15/25	+15/-25	25	172-265	145	230	109	>98	14	23	190
35-15/25	+15/-25	35	172-265	203	230	152	>98	14	31	210
45-15/25	+15/-25	45	172-265	261	230	196	>98	14	40	330
60-15/25	+15/-25	60	172-265	348	230	261	>98	14	40	400
80-15/25	+15/-25	80	172-265	464	230	348	>98	14	51	560
100-15/25	+15/-25	100	172-265	580	230	435	>98	14	51	660

Input voltage variation range **+15%/-35%** (the values listed in the table are referred to 230V nominal voltage)

20-15/35	+15/-35	20	150-265	134	230	87	>98	11	23	200
25-15/35	+15/-35	25	150-265	167	230	109	>98	11	31	220
35-15/35	+15/-35	35	150-265	234	230	152	>98	11	40	340
45-15/35	+15/-35	45	150-265	301	230	196	>98	11	40	410
60-15/35	+15/-35	60	150-265	401	230	261	>98	11	51	570
80-15/35	+15/-35	80	150-265	535	230	348	>98	11	51	670

Input voltage variation range **+15%/-45%** (the values listed in the table are referred to 230V nominal voltage)

15-15/45	+15/-45	15	126-265	118	230	65	>98	9	23	210
20-15/45	+15/-45	20	126-265	158	230	87	>98	9	31	230
25-15/45	+15/-45	25	126-265	198	230	109	>98	9	40	350
35-15/45	+15/-45	35	126-265	276	230	152	>98	9	40	420
45-15/45	+15/-45	45	126-265	356	230	196	>98	9	51	580
60-15/45	+15/-45	60	126-265	474	230	261	>98	9	51	680



Orion

three-phase
2-250kVA



Standard features

Voltage stabilisation	Independent phase control
Selectable output voltage (dip-switch)*	220-230-240V (L-N) / 380-400-415V (L-L)
Frequency	50/60Hz $\pm 5\%$
Admitted load variation	Up to 100%
Admitted load imbalance	100%
Cooling	Natural air ventilation up to 45kVA $\pm 15\%$ Aided with fans from 60kVA $\pm 15\%$
Ambient temperature	-25/+45°C
Storage temperature	-25/+60°C
Max relative humidity	95%
Admitted overload	200% 2 min.
Harmonic distortion	None introduced
Colour	RAL 7035
Protection degree	IP21
Instrumentation	Output digital multimeter
Installation	Indoor
Overvoltage protection	Class II output surge arrestor (from 60kVA $\pm 15\%$)

* The 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.

Accessories

Interrupting devices
Load protection against over/undervoltage
Manual by-pass line
Input isolating transformer
SPD surge arrestor
EMI/RFI filters
Neutral point reactor
IP54 protection degree for indoor and outdoor installation



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Orion three-phase 2-250kVA



Rating in relation to the input variation percentage

±15%	±20%	±25%	±30%	+15%/-25%	+15%/-35%	+15%/-45%
5	4	3	2	4	3	2
10	7	4	3	7	4	3
15	10	7	4	10	7	4
20	15	10	7	15	10	7
30	20	15	10	20	15	10
45	30	20	15	30	20	15
60	45	30	20	45	30	20
80	60	45	30	60	45	30
105	80	60	45	80	60	45
135	105	80	60	105	80	60
150	120	90	80	n.d.	n.d.	n.d.
175	135	105	90	n.d.	n.d.	n.d.
200	150	120	105	n.d.	n.d.	n.d.
250	175	135	120	n.d.	n.d.	n.d.

Orion stabilisers are available for different ranges of input voltage fluctuation.

Standard models offer a **double input connection** so that with the same unit two different input variations ($\pm 1.5\%$ / $\pm 20\%$ or $\pm 25\%$ / $\pm 30\%$) can be dealt with.

The output voltage regulation is performed **independently on each phase** (stabilization of each phase-to-neutral voltage).

Orion stabilisers are used with **three-phase loads** and **single-phase loads** with **100% current imbalance** across the phases and asymmetrical mains voltage.

For the correct operation, Orion voltage stabilisers require the **neutral wire presence**. Operation without neutral wire connection is achievable by adding a device able to generate it (D/Yn isolating transformer or neutral point reactor).

An automatic **circuit breaker** is mounted on the regulation circuit **to protect** against overload and short circuit on the voltage regulator, whilst the auxiliary circuit is protected by **fuses**.

The instrumentation consists of a **multi-task digital line analyser**. Such instrument is able to provide with information regarding the voltage stabiliser output parameters, such as phase and linked voltage, current, power factor, active power, apparent power, reactive power, etc..

The alarms (min/max output voltage, gearmotor lock, internal overheating, regulator overload) are recognizable by means of LEDs on the control card.

Voltage control and stabilisation, performed on the **true RMS value**, are managed by the digital **microprocessor**.

Each phase of every stabiliser belonging to this range is controlled by the **same control board** used on Vega and Antares models, thus simplifying maintenance operations and spare parts storage.

Up to 45kVA, the stabilisers are equipped with wheels for easy handling.

Orion three-phase 2-250kVA



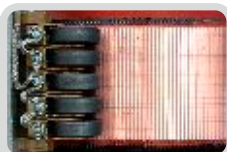
Wide range

- symmetrical: **±15%, ±20%, ±25%, ±30%** (other on request)
 - asymmetrical: **+15%/-25%, +15%/-35%, +15%/-45%** (other on request)
- Output voltage accuracy: **±0.5%**.



Technology

Control and stabilisation, performed on the **true RMS** value, are based on a digital **microprocessor** operating with a software specifically developed for Ortea.
Independent regulation on each phase.



Long life

Ortea system voltage regulator with **rollers** (without brushes, which are subject to heavy wear & tear).



Protection

The voltage regulator is protected by a **circuit breaker** with magneto thermal release.
The auxiliary circuit is protected by **fuses**.
Overvoltage protection: Class II output **surge arrester**.



Instrumentation

Multi-task digital analyser mounted on the front panel (linked and phase voltage, current, frequency, power factor, active power, reactive power, apparent power etc.).

Orion

three-phase
2-250kVA

Type	Input voltage variation range	Rating	Input voltage range	Maximum input current	Output voltage $\pm 0.5\%$	Output current	Efficiency	Speed regulation	Cabinet	Weight
	[%]	[kVA]	[V]	[A]	[V]	[A]	[%]	[ms/V]	Type	[kg]

Input voltage variation range $\pm 20\%/\pm 15\%$ (the values listed in the table are referred to 400V nominal voltage)

4-20	± 20	4	320-480	7.3		5.8		12		90
5-15	± 15	5	340-460	8.5	400	7.2	>96	16	22	
7-20	± 20	7	320-480	13		10		12		96
10-15	± 15	10	340-460	16	400	14	>96	16	22	
10-20	± 20	10	320-480	17		14		12		110
15-15	± 15	15	340-460	25	400	21	>96	16	22	
15-20	± 20	15	320-480	26		21		12		155
20-15	± 15	20	340-460	34	400	29	>98	16	23	
20-20	± 20	20	320-480	36		29		12		180
30-15	± 15	30	340-460	51	400	43	>98	16	23	
30-20	± 20	30	320-480	54		43		12		200
45-15	± 15	45	340-460	76	400	65	>98	16	23	
45-20	± 20	45	320-480	81		65		12		310
60-15	± 15	60	340-460	102	400	87	>98	16	31	
60-20	± 20	60	320-480	109		86		12		430
80-15	± 15	80	340-460	136	400	116	>98	16	40	
80-20	± 20	80	320-480	145		116		12		490
105-15	± 15	105	340-460	179	400	152	>98	16	51	
105-20	± 20	105	320-480	190		152		12		580
135-15	± 15	135	340-460	230	400	195	>98	16	51	
120-20	± 20	120	320-480	217		174		12		710
150-15	± 15	150	340-460	255	400	217	>98	16	55	
135-20	± 20	135	320-480	244		195		12		850
175-15	± 15	175	340-460	298	400	253	>98	16	55	
150-20	± 20	150	320-480	271		217		12		910
200-15	± 15	200	340-460	340	400	289	>98	16	55	
175-20	± 20	175	320-480	316		253		12		950
250-15	± 15	250	340-460	425	400	361	>98	16	55	

Orion

three-phase
2-250kVA

Type	Input voltage variation range	Rating	Input voltage range	Maximum input current	Output voltage $\pm 0.5\%$	Output current	Efficiency	Speed regulation	Cabinet	Weight
	[%]	[kVA]	[V]	[A]	[V]	[A]	[%]	[ms/V]	Type	[kg]

Input voltage variation range $\pm 30\%/\pm 25\%$ (the values listed in the table are referred to 400V nominal voltage)

2-30	± 30	2	280-520	4.1	400	2.9	>96	8	22	90
3-25	± 25	3	300-500	5.7	400	4.3	>96	10	22	90
3-30	± 30	3	280-520	6.1	400	4.3	>96	8	22	96
4-25	± 25	4	300-500	7.7	400	5.8	>96	10	22	96
4-30	± 30	4	280-520	8.3	400	5.8	>96	8	22	110
7-25	± 25	7	300-500	13	400	10	>96	10	22	110
7-30	± 30	7	280-520	14	400	10	>98	8	23	155
10-25	± 25	10	300-500	19	400	14	>98	10	23	155
10-30	± 30	10	280-520	20	400	14	>98	8	23	180
15-25	± 25	15	300-500	29	400	22	>98	10	23	180
15-30	± 30	15	280-520	31	400	22	>98	8	23	200
20-25	± 25	20	300-500	39	400	29	>98	10	23	200
20-30	± 30	20	280-520	41	400	29	>98	8	31	310
30-25	± 25	30	300-500	57	400	43	>98	10	31	310
30-30	± 30	30	280-520	61	400	43	>98	8	40	430
45-25	± 25	45	300-500	86	400	65	>98	10	40	430
45-30	± 30	45	280-520	93	400	65	>98	8	51	490
60-25	± 25	60	300-500	116	400	87	>98	10	51	490
60-30	± 30	60	280-520	124	400	87	>98	8	51	580
80-25	± 25	80	300-500	155	400	116	>98	10	51	580
80-30	± 30	80	280-520	165	400	116	>98	8	55	710
90-25	± 25	90	300-500	173	400	130	>98	10	55	710
90-30	± 30	90	280-520	185	400	130	>98	8	55	850
105-25	± 25	105	300-500	203	400	152	>98	10	55	850
105-30	± 30	105	280-520	217	400	152	>98	8	55	910
120-25	± 25	120	300-500	231	400	173	>98	10	55	910
120-30	± 30	120	280-520	247	400	173	>98	8	55	950
135-25	± 25	135	300-500	260	400	195	>98	10	55	950

Orion

three-phase

2-250kVA

Type	Input voltage variation range	Rating	Input voltage range	Maximum input current	Output voltage $\pm 0.5\%$	Output current	Efficiency	Speed regulation	Cabinet	Weight
	[%]	[kVA]	[V]	[A]	[V]	[A]	[%]	[ms/V]	Type	[kg]

Input voltage variation range **+15%/-25%** (the values listed in the table are referred to 400V nominal voltage)

4-15/25	+15/-25	4	300-460	7.7	400	5.8	>96	14	22	100
7-15/25	+15/-25	7	300-460	13	400	10	>96	14	22	110
10-15/25	+15/-25	10	300-460	19	400	14	>96	14	22	120
15-15/25	+15/-25	15	300-460	29	400	22	>98	14	23	165
20-15/25	+15/-25	20	300-460	39	400	29	>98	14	23	190
30-15/25	+15/-25	30	300-460	57	400	43	>98	14	23	220
45-15/25	+15/-25	45	300-460	87	400	65	>98	14	31	330
60-15/25	+15/-25	60	300-460	116	400	87	>98	14	40	450
80-15/25	+15/-25	80	300-460	155	400	116	>98	14	51	510
105-15/25	+15/-25	105	300-460	203	400	152	>98	14	51	600

Input voltage variation range **+15%/-35%** (the values listed in the table are referred to 400V nominal voltage)

3-15/35	+15/-35	3	260-460	6.6	400	4.3	>96	10	22	100
4-15/35	+15/-35	4	260-460	8.9	400	5.8	>96	10	22	110
7-15/35	+15/-35	7	260-460	15	400	10	>96	10	22	120
10-15/35	+15/-35	10	260-460	22	400	14	>98	10	23	165
15-15/35	+15/-35	15	260-460	34	400	22	>98	10	23	190
20-15/35	+15/-35	20	260-460	45	400	29	>98	10	23	220
30-15/35	+15/-35	30	260-460	66	400	43	>98	10	31	330
45-15/35	+15/-35	45	260-460	100	400	65	>98	10	40	450
60-15/35	+15/-35	60	260-460	134	400	87	>98	10	51	510
80-15/35	+15/-35	80	260-460	178	400	116	>98	10	51	600

Input voltage variation range **+15%/-45%** (the values listed in the table are referred to 400V nominal voltage)

2-15/45	+15/-45	2	220-460	5.3	400	2.9	>96	8	22	100
3-15/45	+15/-45	3	220-460	7.8	400	4.3	>96	8	22	110
4-15/45	+15/-45	4	220-460	11	400	5.8	>96	8	22	120
7-15/45	+15/-45	7	220-460	18	400	10	>98	8	23	165
10-15/45	+15/-45	10	220-460	25	400	14	>98	8	23	190
15-15/45	+15/-45	15	220-460	39	400	22	>98	8	23	220
20-15/45	+15/-45	20	220-460	53	400	29	>98	8	31	330
30-15/45	+15/-45	30	220-460	78	400	43	>98	8	40	450
45-15/45	+15/-45	45	220-460	118	400	65	>98	8	51	510
60-15/45	+15/-45	60	220-460	158	400	87	>98	8	51	600



Orion Plus

three-phase
30-1250kVA



Standard features

Voltage stabilisation	Independent phase control
PC selectable output voltage*	from 210 to 255V (L-N) from 360 to 440V (L-L)
Frequency	50/60Hz $\pm 5\%$
Admitted load variation	Up to 100%
Admitted load imbalance	100%
Cooling	Natural air ventilation. Up to 35°C aided with fans
Ambient temperature	-25/+45°C
Storage temperature	-25/+60°C
Max relative humidity	95%
Admitted overload	200% 2 min.
Harmonic distortion	None introduced
Colour	RAL 7035
Protection degree	IP21
Instrumentation	Input & output digital multimeter
Installation	Indoor
Overvoltage protection	<ul style="list-style-type: none"> – Class II output surge arrestor – Optimal voltage return through supercapacitors – in case of blackout

* The 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.

Accessories

Interrupting devices
Load protection against over/undervoltage
Manual by-pass line
Total protection kit
Input isolating transformer
Integrated automatic power factor correction system
SPD surge arrestor
EMI/RFI filters
Neutral point reactor
IP54 protection degree for indoor and outdoor installation



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Orion Plus three-phase 30-1250kVA

Rating in relation to the input variation percentage

±15%	±20%	±25%	±30%	+15%/-35%	+15%/-45%
80	60	45	30	45	30
105	80	60	45	60	45
135	105	80	60	80	60
150	120	90	80	90	80
175	135	105	90	105	90
200	150	120	105	120	105
250	175	135	120	135	120
320	250	200	150	200	150
400	300	250	200	250	200
500	400	300	250	300	250
630	500	400	300	400	300
800	630	500	400	500	400
1000	800	630	500	630	500
1250	1000	800	630	800	630

Orion Plus stabilisers are available for different ranges of input voltage fluctuation. In the ±15%/ ±20% and ±25%/ ±30% types, the change of input range is obtained through different internal connections.

The Orion Plus voltage stabilisers regulate the output voltage **independently on each phase**.

Similarly to the Orion stabilisers, they can supply **any single-phase, bi-phase and three-phase load** even in case of and up to **100% unbalanced load current** and asymmetrical mains distribution.

In this configuration, the presence of **the neutral wire is required**. The stabiliser can also operate without neutral wire by adding a device able to generate it (D/zn or D /yn isolating transformer or neutral point reactor).

The stabilisers are cooled via **natural air ventilation**, assisted by extracting fans when the cabinet internal temperature exceeds 35°C).

The instrumentation consists of **two multi-task digital line analysers** which are able to provide with information regarding the status of the lines upstream and downstream the voltage stabiliser (phase and linked voltages, current, power factor, active power, apparent power, reactive power, etc.)

The operating status of the stabiliser can be **monitored** by means of the **LEDs** on the front panel displaying all the **information** regarding each phase operating mode ('power on'; reaching of voltage regulation limits; increase/decrease of voltage regulation) and the possible **alarms** (minimum and maximum voltage, maximum current: overtemperature; ventilation failure). The alarm indicators are accompanied by an acoustic alarm.

– Up to 250kVA ±15%, the regulation circuit is protected against overload and short circuit on the voltage regulator by an **automatic circuit breaker**.

– From 300kVA ±15%, an **electronic voltage regulator protection system** activates in case of overload on the voltage regulator. In such condition, the load supply is not interrupted, but the stabiliser output voltage is automatically set to the lower between the mains voltage and the pre-set output voltage.

The service continuity is guaranteed, although the voltage is not stabilised. When the overload condition ceases to exist, the stabiliser switches automatically back to regular functioning.

The auxiliary circuits are protected by **fuses**.

The control logic, performed on the **true RMS** value, is based on **DSP microprocessors**.

The unit parameters and the output voltage reference can be **set** by using a **personal computer**, thus allowing for dealing directly in the field with any problems related to voltage stability.

All Orion Plus stabilisers are provided with **Class II SPD surge arrestors**.



Orion Plus

three-phase
30-1250kVA



Wide range

- symmetrical: **±15%, ±20%, ±25%, ±30%** (other on request)
 - asymmetrical: **+15%/-35%, +15%/-45%** (other on request)
- Output voltage accuracy: **±0.5%**.

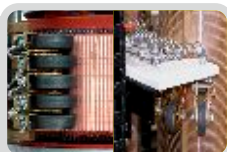


Technology

Control and stabilisation, performed on the **true RMS** value, are based on a digital **microprocessor** operating with a software specifically developed for Ortea.

Parameters and reference voltage can be **set** via a **PC**, thus allowing for adjusting the stabiliser to the actual site conditions.

Independent regulation on each phase.



Long life

Ortea system voltage regulator with **rollers** (without brushes, which are subject to heavy wear & tear). Depending on the rating, the voltage regulator could be **toroidal** or **columnar**.



Protection

Up to 250kVA ±15%: The voltage regulator is protected by a three-phase automatic **circuit breaker**.

The auxiliary circuit is protected by **fuses**.

Overvoltage protection: Class II output **surge arrestor**.



Protection

From 300kVA ±15%: The stabiliser is provided of an **electronic** voltage regulator **protection system** activates in case of overload on the voltage regulator. In such conditions, the **load supply is not interrupted**.

The auxiliary circuit is protected by **fuses**.

Overvoltage protection: Class II output **surge arrestor**.



Protection

Output voltage reset to the minimum value in case of blackout by means of **supercapacitors** banks in order to ensure the correct shutdown.



Instrumentation

Two **multi-task digital analyser** mounted on the front panel (linked and phase voltage current, frequency, power factor, active power, reactive power, apparent power etc.).



Monitoring

The stabiliser **operating mode** can be easily **monitored** by means of the **LEDs** on the front panel, which provide with **information** and **alarms**.

Orion Plus

three-phase
30-1250kVA

Type	Input voltage variation range	Rating	Input voltage range	Maximum input current	Output voltage $\pm 0.5\%$	Output current	Efficiency	Speed regulation	Cabinet	Weight
	[%]	[kVA]	[V]	[A]	[V]	[A]	[%]	[ms/V]	Type	[kg]

Input voltage variation range $\pm 20\%/\pm 15\%$ (the values listed in the table are referred to 400V nominal voltage)

60-20	± 20	60	320-480	109		86		12		
80-15	± 15	80	340-460	136	400	116	>98	16	51	430
80-20	± 20	80	320-480	145		116		12		
105-15	± 15	105	340-460	179	400	152	>98	16	51	490
105-20	± 20	105	320-480	190		152		12		
135-15	± 15	135	340-460	229	400	195	>98	16	51	580
120-20	± 20	120	320-480	216		173		14		
150-15	± 15	150	340-460	255	400	217	>98	18	55	710
135-20	± 20	135	320-480	244		195		14		
175-15	± 15	175	340-460	298	400	253	>98	18	55	760
150-20	± 20	150	320-480	271		217		14		
200-15	± 15	200	340-460	340	400	289	>98	18	55	850
175-20	± 20	175	320-480	316		253		14		
250-15	± 15	250	340-460	425	400	361	>98	18	55	950
250-20	± 20	250	320-480	446		361		15		
320-15	± 15	320	340-460	544	400	462	>98	20	55	850
300-20	± 20	300	320-480	543		434		15		
400-15	± 15	400	340-460	680	400	578	>98	20	55	1100
400-20	± 20	400	320-480	723		578		15		
500-15	± 15	500	340-460	851	400	723	>98	20	53	1400
500-20	± 20	500	320-480	904		723		15		
630-15	± 15	630	340-460	1071	400	910	>98	20	67	1600
630-20	± 20	630	320-480	1138		910		18		
800-15	± 15	800	340-460	1360	400	1156	>98	24	62	2000
800-20	± 20	800	320-480	1445		1156		18		
1000-15	± 15	1000	340-460	1700	400	1445	>98	24	62	2200
1000-20	± 20	1000	320-480	1806		1445		18		
1250-15	± 15	1250	340-460	2125	400	1806	>98	24	63	2400

Orion Plus

three-phase
30-1250kVA

Type	Input voltage variation range	Rating	Input voltage range	Maximum input current	Output voltage $\pm 0.5\%$	Output current	Efficiency	Speed regulation	Cabinet	Weight
	[%]	[kVA]	[V]	[A]	[V]	[A]	[%]	[ms/V]	Type	[kg]

Input voltage variation range $\pm 30\%/\pm 25\%$ (the values listed in the table are referred to 400V nominal voltage)

30-30	± 30	30	280-520	61	400	43	>98	8	51	430
45-25	± 25	45	300-500	86	400	65	>98	10	51	490
45-30	± 30	45	280-520	93	400	65	>98	8	51	490
60-25	± 25	60	300-500	116	400	87	>98	10	51	580
60-30	± 30	60	280-520	124	400	87	>98	8	51	580
80-25	± 25	80	300-500	155	400	116	>98	10	55	710
80-30	± 30	80	280-520	166	400	116	>98	9	55	710
90-25	± 25	90	300-500	173	400	130	>98	11	55	760
90-30	± 30	90	280-520	185	400	130	>98	9	55	760
105-25	± 25	105	300-500	203	400	152	>98	11	55	850
105-30	± 30	105	280-520	217	400	152	>98	9	55	850
120-25	± 25	120	300-500	231	400	173	>98	11	55	950
120-30	± 30	120	280-520	247	400	173	>98	9	55	950
135-25	± 25	135	300-500	260	400	195	>98	11	55	1200
150-30	± 30	150	280-520	310	400	217	>98	10	55	1200
200-25	± 25	200	300-500	385	400	289	>98	12	55	1300
200-30	± 30	200	280-520	413	400	289	>98	10	55	1300
250-25	± 25	250	300-500	481	400	361	>98	12	53	1400
250-30	± 30	250	280-520	515	400	361	>98	10	53	1400
300-25	± 25	300	300-500	579	400	434	>98	12	67	1600
300-30	± 30	300	280-520	620	400	434	>98	10	67	1600
400-25	± 25	400	300-500	771	400	578	>98	12	62	2000
400-30	± 30	400	280-520	826	400	578	>98	12	62	2000
500-25	± 25	500	300-500	963	400	723	>98	15	62	2200
500-30	± 30	500	280-520	1032	400	723	>98	12	62	2200
630-25	± 25	630	300-500	1214	400	910	>98	15	63	2400
630-30	± 30	630	280-520	1300	400	910	>98	12	63	2400
800-25	± 25	800	300-500	1541	400	1156	>98	15	63	2400

Orion Plus

three-phase
30-1250kVA

Type	Input voltage variation range	Rating	Input voltage range	Maximum input current	Output voltage $\pm 0.5\%$	Output current	Efficiency	Speed regulation	Cabinet	Weight
	[%]	[kVA]	[V]	[A]	[V]	[A]	[%]	[ms/V]	Type	[kg]

Input voltage variation range **+15%/-35%** (the values listed in the table are referred to 400V nominal voltage)

45-15/35	+15/-35	45	260-460	100	400	65	>98	10	51	470
60-15/35	+15/-35	60	260-460	134	400	87	>98	10	51	550
80-15/35	+15/-35	80	260-460	178	400	116	>98	10	51	600
90-15/35	+15/-35	90	260-460	200	400	130	>98	11	55	850
105-15/35	+15/-35	105	260-460	234	400	152	>98	11	55	950
120-15/35	+15/-35	120	260-460	266	400	173	>98	11	55	1050
135-15/35	+15/-35	135	260-460	300	400	195	>98	11	55	1200
200-15/35	+15/-35	200	260-460	445	400	289	>98	12	55	1500
250-15/35	+15/-35	250	260-460	555	400	361	>98	12	52	1650
300-15/35	+15/-35	300	260-460	668	400	434	>98	12	52	1750
400-15/35	+15/-35	400	260-460	889	400	578	>98	12	62	2100
500-15/35	+15/-35	500	260-460	1111	400	723	>98	15	63	2900
630-15/35	+15/-35	630	260-460	1400	400	910	>98	15	63	3050
800-15/35	+15/-35	800	260-460	1778	400	1156	>98	15	64	3800

Input voltage variation range **+15%/-45%** (the values listed in the table are referred to 400V nominal voltage)

30-15/45	+15/-45	30	220-460	78	400	43	>98	8	51	470
45-15/45	+15/-45	45	220-460	118	400	65	>98	8	51	550
60-15/45	+15/-45	60	220-460	158	400	87	>98	8	51	600
80-15/45	+15/-45	80	220-460	211	400	116	>98	9	55	850
90-15/45	+15/-45	90	220-460	236	400	130	>98	9	55	950
105-15/45	+15/-45	105	220-460	276	400	152	>98	9	55	1050
120-15/45	+15/-45	120	220-460	315	400	173	>98	9	55	1250
150-15/45	+15/-45	150	220-460	395	400	217	>98	10	55	1450
200-15/45	+15/-45	200	220-460	525	400	289	>98	10	52	1650
250-15/45	+15/-45	250	220-460	656	400	361	>98	10	52	1800
300-15/45	+15/-45	300	220-460	789	400	434	>98	10	62	2200
400-15/45	+15/-45	400	220-460	1051	400	578	>98	12	63	3000
500-15/45	+15/-45	500	220-460	1315	400	723	>98	12	63	3200
630-15/45	+15/-45	630	220-460	1655	400	910	>98	12	64	4000



Sirius

three-phase
60-6000kVA



Standard features

Voltage stabilisation	Independent phase control
Output voltage selectable via display, PC and/or Ethernet*	from 210 to 255V (L-N) from 360 to 440V (L-L)
Frequency	50/60Hz $\pm 5\%$
Admitted load variation	Up to 100%
Admitted load imbalance	100%
Cooling	Natural air ventilation. Up to 35°C aided with fans
Ambient temperature	-25/+45°C
Storage temperature	-25/+60°C
Max relative humidity	95%
Admitted overload	200% 2 min.
Harmonic distortion	None introduced
Colour	RAL 7035
Protection degree	IP21
Instrumentation	– Input & output digital multimeter with RS485 port – LCD display
Installation	Indoor
Regulator overload protection	Digital control
Communication system	Ethernet / GPRS / USB / MODBUS TCP/IP
Overvoltage protection	– Class I input surge arrestor – Class II output surge arrestor – Optimal voltage return through supercapacitors – in case of blackout

* The 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.

Accessories

Interrupting devices
Load protection against over/undervoltage
Manual by-pass line
Total protection kit
Input isolating transformer
Integrated automatic power factor correction system
EMI/RFI filters
Neutral point reactor
IP54 protection degree for indoor and outdoor installation



All ORTEA stabilisers 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 9001:2008 Standards. The commitment towards environmental issues and safety at work matters is guaranteed by the certification of the Management System according to the ISO 14001:2004 and OHSAS 18001:2007 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 do hold therefore any contractual value.

Sirius

three-phase

60-6000kVA

Rating in relation to the input variation percentage

±10%	±15%	±20%	±25%	±30%	+15%/-35%	+15%/-45%
200	125	100	80	60	80	60
250	160	125	100	80	100	80
320	200	160	125	100	125	100
400	250	200	160	125	160	125
500	320	250	200	160	200	160
630	400	320	250	200	250	200
800	500	400	320	250	320	250
1000	630	500	400	320	400	320
1250	800	630	500	400	500	400
1600	1000	800	630	500	630	500
2000	1250	1000	800	630	800	630
2500	1600	1250	1000	800	1000	800
3200	2000	1600	1250	1000	1250	1000
4000	2500	2000	1600	1250	1600	1250
5000	3200	2500	2000	1600	2000	1600
6000	4000	3200	2500	2000	2500	2000

Sirius stabilisers are available for different ranges of input voltage fluctuation. In the $\pm 15\%$ / $\pm 20\%$ and $\pm 25\%$ / $\pm 30\%$ types, the change of input range is obtained through different internal connections (only up to 2000kVA $\pm 15\%$ and equivalent).

Sirius stabilisers are equipped with **columnar voltage regulators** which enable the achievement of **high ratings** (up to 6000kVA) and a **solid and reliable construction**, thus **meeting the most diverse industrial applications**.

The Sirius voltage stabilisers regulate the output voltage **independently on each phase**. Similarly to the other models, they can supply **any single-phase, bi-phase and three-phase load** even in case of and up to **100% unbalanced load current** and asymmetrical mains distribution.

In any case, the presence of the **neutral wire is required**. The stabiliser can also operate without neutral wire by adding a device able to generate it (D/zn or D/yn isolating transformer or neutral point reactor).

The stabilisers are cooled via **natural air ventilation**, assisted by extracting fans when the cabinet internal temperature exceeds 35°C.

The instrumentation consists of **two multi-task digital line analysers** (fitted with RS485 port) able to provide with information regarding the status of the lines upstream and downstream the voltage stabiliser (phase and linked voltages, current, power factor, active power, apparent power, reactive power, etc.)

The operating status of the stabiliser can be **monitored** by means of the **LEDs** on the front panel displaying all the **information** regarding each phase operating mode ('power on'; reaching of voltage regulation limits; increase/decrease of voltage regulation) and the possible **alarms** (minimum and maximum voltage, maximum current: overtemperature; ventilation failure). The alarm indicators are accompanied by an acoustic alarm.

Monitoring activities can be **run remotely** by installing the **STABIMON software** provided with the unit on a PC (connected to the stabiliser via Ethernet or a GPRS modem). The readings are **stored locally by the control system** and **sent** via the **Internet** (if an Ethernet or GPRS modem connection is established) to a server at Ortea HQ, thus providing the Service centre with the necessary information.

It is also possible to communicate with the stabiliser with the **Modbus TCP/IP** protocol (standard communication protocol between electronic industrial equipment) via an Ethernet connection with RJ45 cable.

The control system is also provided with two **USB ports** for downloading stored data and uploading new releases of the control card software.

The Sirius stabiliser is provided with an **electronic voltage regulator protection system** activates in case of overload on the voltage regulator. In such condition the load supply is not interrupted, but the stabiliser output voltage is automatically set to the lower between the mains voltage and the pre-set



Sirius

three-phase

60-6000kVA



output voltage. The **service continuity is guaranteed**, although the voltage is not stabilised. When the overload condition ceases to exist, the stabiliser switches automatically back to regular functioning. The control logic is managed by two **DSP microprocessors** (one performing the control and the other one managing the measurements) which obtain the output voltage stabilisation by adjusting its **true RMS** value. The whole system is **supervised** by a third '**bodyguard**' microprocessor that controls the correct functioning of the other microprocessors.

The unit parameters and reference output voltage value can be **set** via a **PC** connection, allowing for promptly dealing in the field with any issues concerning voltage stability.

The output voltage is reset to the minimum value in case of blackout by means of supercapacitor banks in order to ensure the correct shutdown.

All Sirius stabilisers are provided with Class I and Class II **SPD surge arrestors**.

Remote communication with the stabiliser

The all-in-one control card manages also the remote **communication** to the voltage stabiliser. The card is fitted with a **local display** (showing alarms and setting parameters) and with a keypad used to interact with the card itself.

The **remote data monitoring system** enables the user and Ortea Service Centre the chance of monitoring the stabiliser on-line wherever installed by means of the **STABIMON** dedicated software, supplied with each unit.

Alternatively, the communication with the stabiliser can be established via the **Modbus TCP/IP** protocol. Should the Ethernet connection not be available, the remote communication can be performed via an embedded GPRS modem. A common SIM data card purchased locally and inserted in the modem allows for a simple data transmission.



STABIMON software

STABIMON is the software managing the communication with the voltage stabiliser. The program can be run when the user wishes to communicate with the stabiliser or simply read the collected information.

In a single page, a dashboard provides with the main information concerning voltage, current, power and alarm status.

On the left-hand side of the page, each phase input voltage, current and cosphi are shown, while on the right-hand side, the corresponding output parameters are shown.

In the central area between input and output parameters, mains frequency and general information for the stabiliser identification are displayed.

The lower part of the screen is used to visualise communication errors (if any), input and output active, reactive and apparent powers, voltages and temperature measured on the base board.

The LED status as available on the stabiliser control panel is also reproduced (the LEDs are red in case of error).

Graphs and statistics relevant to the stabiliser operating status can also be displayed.



Wide range

- symmetrical: **±10%, ±15%, ±20%, ±25%, ±30%** (other on request)
 - asymmetrical: **+15%/-35%, +15%/-45%** (other on request)
- Output voltage accuracy: **±0.5%**.



Technology

Control and stabilisation, performed on the **true RMS** value, are based on two **two-way DSP-microprocessor** operating with a software specifically developed for Ortea and under the supervision provided by a third **microprocessor (bodyguard)**.

Parameters and reference voltage can be **set** via a **PC**, thus allowing for solving any problems related to voltage stability directly in the field.

Independent regulation on each phase.

Sirius

three-phase

60-6000kVA



Long life

Ortea system voltage regulator with **rollers** (without brushes, which are subject to heavy wear & tear). **Columnar voltage regulator** make possible to achieve **high ratings** (up to 6000kVA) and a solid and reliable construction



Protection

The stabiliser is provided of an **electronic** voltage regulator **protection system** activates in case of overload on the voltage regulator.
In such conditions, the **load supply is not interrupted**.
The auxiliary circuit is protected by **fuses**.



Protection

Overvoltage protection:
– Class I input **surge arrestor**.
– Class II output **surge arrestor**.



Protection

Output voltage reset to the minimum value in case of blackout by means of **supercapacitors** banks in order to ensure the correct shutdown.



Instrumentation

Two **multi-task digital analyser** mounted on the front panel and fitted with RS485 port (linked and phase voltage current, frequency, power factor, active power, reactive power, apparent power etc.).



Monitoring

The local **display** embedded in the front panel enables the visualization of **operating mode** and setting data.



Monitoring

The stabiliser **operating mode** can be easily **monitored** by means of the **LEDs** on the front panel, which provide with **information** and **alarms**.



Monitoring

Monitoring activities can be run remotely by installing on a PC (connected to the stabiliser via Ethernet) the **STABIMON software** provided with the unit.
It is also possible to communicate with the stabiliser with the **Modbus TCP/IP** protocol.



Monitoring

The control system is able to interface with the **Internet** thanks to its capability to connect with **Ethernet** and **Gprs** protocols.
This allows for a remote monitoring of the equipment made by Ortea at its headquarters, thus guaranteeing **prompt assistance** worldwide.

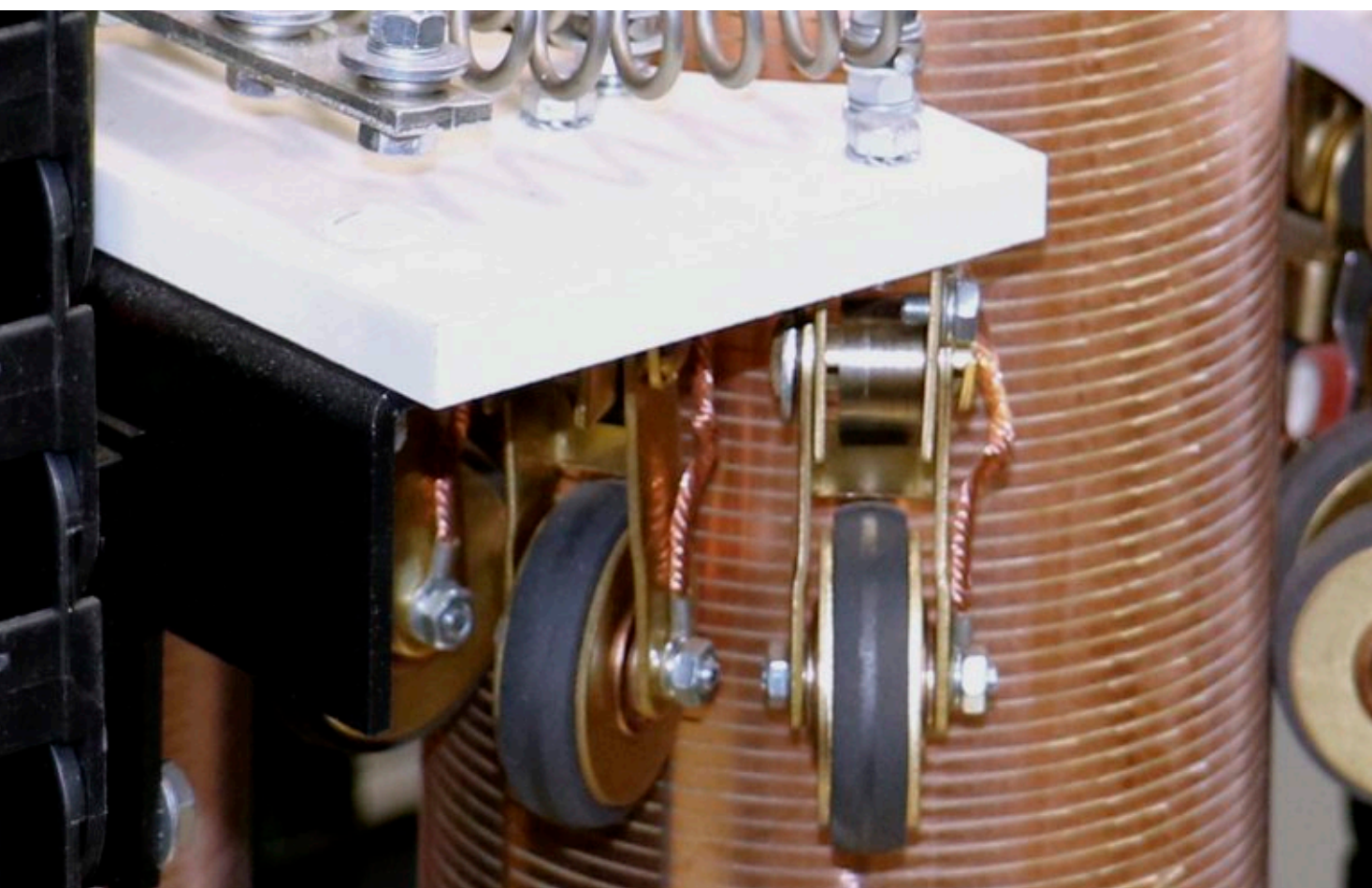
Sirius

three-phase
60-6000kVA

Type	Input voltage variation range	Rating	Input voltage range	Maximum input current	Output voltage $\pm 0.5\%$	Output current	Efficiency	Speed regulation	Cabinet	Weight
	[%]	[kVA]	[V]	[A]	[V]	[A]	[%]	[ms/V]	Type	[kg]

Input voltage variation range $\pm 10\%$ (the values listed in the table are referred to 400V nominal voltage)

200-10	± 10	200	360-440	321	400	289	>98	30	54	650
250-10	± 10	250	360-440	401	400	361	>98	30	54	670
320-10	± 10	320	360-440	514	400	462	>98	30	55	900
400-10	± 10	400	360-440	642	400	578	>98	30	55	950
500-10	± 10	500	360-440	803	400	723	>98	30	55	1050
630-10	± 10	630	360-440	1011	400	910	>98	30	55	1300
800-10	± 10	800	360-440	1284	400	1156	>98	30	53	1400
1000-10	± 10	1000	360-440	1606	400	1445	>98	30	62	1700
1250-10	± 10	1250	360-440	2007	400	1806	>98	36	62	2200
1600-10	± 10	1600	360-440	2569	400	2312	>98	36	63	2400
2000-10	± 10	2000	360-440	3211	400	2890	>98	36	64	3000
2500-10	± 10	2500	360-440	4014	400	3613	>98	36	70	4000
3200-10	± 10	3200	360-440	5138	400	4624	>98	36	70	4300
4000-10	± 10	4000	360-440	6422	400	5780	>98	45	80	6000
5000-10	± 10	5000	360-440	8028	400	7225	>98	45	80	7300
6000-10	± 10	6000	360-440	9634	400	8671	>98	54	90	11000



Sirius

three-phase
60-6000kVA

Type	Input voltage variation range	Rating	Input voltage range	Maximum input current	Output voltage $\pm 0.5\%$	Output current	Efficiency	Speed regulation	Cabinet	Weight
	[%]	[kVA]	[V]	[A]	[V]	[A]	[%]	[ms/V]	Type	[kg]

Input voltage variation range $\pm 20\%/\pm 15\%$ (the values listed in the table are referred to 400V nominal voltage)

100-20	± 20	100	320-480	180		144	>98	15	54	650
125-15	± 15	125	340-460	213	400	181	>98	20		
125-20	± 20	125	320-480	226	400	181	>98	15	54	670
160-15	± 15	160	340-460	272		231	>98	20		
160-20	± 20	160	320-480	289	400	231	>98	15	55	900
200-15	± 15	200	340-460	340		289	>98	20		
200-20	± 20	200	320-480	361	400	289	>98	15	55	950
250-15	± 15	250	340-460	425		361	>98	20		
250-20	± 20	250	320-480	452	400	361	>98	15	55	1050
320-15	± 15	320	340-460	544		462	>98	20		
320-20	± 20	320	320-480	578	400	462	>98	15	55	1300
400-15	± 15	400	340-460	680		578	>98	20		
400-20	± 20	400	320-480	722	400	578	>98	15	53	1400
500-15	± 15	500	340-460	851		723	>98	20		
500-20	± 20	500	320-480	903	400	723	>98	15	62	1700
630-15	± 15	630	340-460	1071		910	>98	20		
630-20	± 20	630	320-480	1138	400	910	>98	18	62	2200
800-15	± 15	800	340-460	1360		1156	>98	24		
800-20	± 20	800	320-480	1445	400	1156	>98	18	63	2400
1000-15	± 15	1000	340-460	1700		1445	>98	24		
1000-20	± 20	1000	320-480	1806	400	1445	>98	18	64	3000
1250-15	± 15	1250	340-460	2125		1806	>98	24		
1250-20	± 20	1250	320-480	2258	400	1806	>98	18	70	4000
1600-15	± 15	1600	340-460	2720		2312	>98	24		
1600-20	± 20	1600	320-480	2890	400	2312	>98	18	70	4300
2000-15	± 15	2000	340-460	3400		2890	>98	24		
2000-20	± 20	2000	320-480	3613	400	2890	>98	22	80	6000
2500-15	± 15	2500	340-460	4251	400	3613	>98	30	80	6000
2500-20	± 20	2500	320-480	4516	400	3613	>98	22	80	7300
3200-15	± 15	3200	340-460	5440	400	4624	>98	30	80	7300
3200-20	± 20	3200	320-480	5780	400	4624	>98	27	90	11000
4000-15	± 15	4000	340-460	6800	400	5780	>98	36	90	11000

Sirius

three-phase
60-6000kVA

Type	Input voltage variation range	Rating	Input voltage range	Maximum input current	Output voltage $\pm 0.5\%$	Output current	Efficiency	Speed regulation	Cabinet	Weight
	[%]	[kVA]	[V]	[A]	[V]	[A]	[%]	[ms/V]	Type	[kg]

Input voltage variation range $\pm 30\%/\pm 25\%$ (the values listed in the table are referred to 400V nominal voltage)

60-30	± 30	60	280-520	124	400	87	>98	10	54	650
80-25	± 25	80	300-500	154	400	116	>98	12	54	670
80-30	± 30	80	280-520	165	400	116	>98	10	54	670
100-25	± 25	100	300-500	193	400	144	>98	12	55	900
100-30	± 30	100	280-520	206	400	144	>98	10	55	900
125-25	± 25	125	300-500	241	400	181	>98	12	55	950
125-30	± 30	125	280-520	258	400	181	>98	10	55	950
160-25	± 25	160	300-500	308	400	231	>98	12	55	1050
160-30	± 30	160	280-520	330	400	231	>98	10	55	1050
200-25	± 25	200	300-500	385	400	289	>98	12	55	1300
200-30	± 30	200	280-520	413	400	289	>98	10	55	1300
250-25	± 25	250	300-500	482	400	361	>98	12	53	1400
250-30	± 30	250	280-520	516	400	361	>98	10	53	1400
320-25	± 25	320	300-500	617	400	462	>98	12	62	1700
320-30	± 30	320	280-520	661	400	462	>98	10	62	1700
400-25	± 25	400	300-500	770	400	578	>98	12	62	2200
400-30	± 30	400	280-520	826	400	578	>98	12	62	2200
500-25	± 25	500	300-500	963	400	723	>98	15	63	2400
500-30	± 30	500	280-520	1032	400	723	>98	12	63	2400
630-25	± 25	630	300-500	1214	400	910	>98	15	64	3000
630-30	± 30	630	280-520	1300	400	910	>98	12	64	3000
800-25	± 25	800	300-500	1541	400	1156	>98	15	70	4000
800-30	± 30	800	280-520	1651	400	1156	>98	12	70	4000
1000-25	± 25	1000	300-500	1927	400	1445	>98	15	70	4300
1000-30	± 30	1000	280-520	2064	400	1445	>98	12	70	4300
1250-25	± 25	1250	300-500	2408	400	1806	>98	15	80	6000
1250-30	± 30	1250	280-520	2580	400	1806	>98	15	80	6000
1600-25	± 25	1600	300-500	3083	400	2312	>98	18	80	7300
1600-30	± 30	1600	280-520	3303	400	2312	>98	15	80	7300
2000-25	± 25	2000	300-500	3853	400	2890	>98	18	90	11000
2000-30	± 30	2000	280-520	4130	400	2892	>98	18	90	11000
2500-25	± 25	2500	300-500	4817	400	3613	>98	22	90	11000

Sirius

three-phase
60-6000kVA

Type	Input voltage variation range	Rating	Input voltage range	Maximum input current	Output voltage $\pm 0.5\%$	Output current	Efficiency	Speed regulation	Cabinet	Weight
	[%]	[kVA]	[V]	[A]	[V]	[A]	[%]	[ms/V]	Type	[kg]

Input voltage variation range **+15%/-35%** (the values listed in the table are referred to 400V nominal voltage)

80-15/35	+15/-35	80	260-460	178	400	116	>98	12	54	770
100-15/35	+15/-35	100	260-460	222	400	144	>98	12	54	800
125-15/35	+15/-35	125	260-460	278	400	181	>98	12	55	1050
160-15/35	+15/-35	160	260-460	356	400	231	>98	12	55	1150
200-15/35	+15/-35	200	260-460	444	400	289	>98	12	55	1250
250-15/35	+15/-35	250	260-460	556	400	361	>98	12	52	1700
320-15/35	+15/-35	320	260-460	711	400	462	>98	12	52	1800
400-15/35	+15/-35	400	260-460	889	400	578	>98	12	63	2100
500-15/35	+15/-35	500	260-460	1111	400	723	>98	15	63	2900
630-15/35	+15/-35	630	260-460	1400	400	910	>98	15	64	3050
800-15/35	+15/-35	800	260-460	1778	400	1156	>98	15	70	3800
1000-15/35	+15/-35	1000	260-460	2223	400	1445	>98	15	70	4450
1250-15/35	+15/-35	1250	260-460	2779	400	1806	>98	15	72	4800
1600-15/35	+15/-35	1600	260-460	3557	400	2312	>98	18	82	7700
2000-15/35	+15/-35	2000	260-460	4446	400	2890	>98	18	82	9050
2500-15/35	+15/-35	2500	260-460	5558	400	3613	>98	22	92	13500

Input voltage variation range **+15%/-45%** (the values listed in the table are referred to 400V nominal voltage)

60-15/45	+15/-45	60	220-460	158	400	87	>98	10	54	850
80-15/45	+15/-45	80	220-460	211	400	116	>98	10	54	900
100-15/45	+15/-45	100	220-460	262	400	144	>98	10	55	1200
125-15/45	+15/-45	125	220-460	329	400	181	>98	10	55	1250
160-15/45	+15/-45	160	220-460	420	400	231	>98	10	55	1400
200-15/45	+15/-45	200	220-460	525	400	289	>98	10	52	1900
250-15/45	+15/-45	250	220-460	656	400	361	>98	10	52	2000
320-15/45	+15/-45	320	220-460	840	400	462	>98	10	63	2300
400-15/45	+15/-45	400	220-460	1051	400	578	>98	12	63	3200
500-15/45	+15/-45	500	220-460	1315	400	723	>98	12	64	3400
630-15/45	+15/-45	630	220-460	1655	400	910	>98	12	70	4200
800-15/45	+15/-45	800	220-460	2102	400	1156	>98	12	70	4900
1000-15/45	+15/-45	1000	220-460	2627	400	1445	>98	12	72	5300
1250-15/45	+15/-45	1250	220-460	3284	400	1806	>98	15	82	8700
1600-15/45	+15/-45	1600	220-460	4204	400	2312	>98	15	82	10100
2000-15/45	+15/-45	2000	220-460	5254	400	2890	>98	18	92	15000

Sirius Advance

three-phase
60-4000kVA



Standard features

Voltage stabilisation	Independent phase control
Output voltage selectable via display, PC and/or Ethernet*	from 210 to 255V (L-N) from 360 to 440V (L-L)
Frequency	50/60Hz $\pm 5\%$
Admitted load variation	Up to 100%
Admitted load imbalance	100%
Cooling	Natural air ventilation. Up to 35°C aided with fans
Ambient temperature	-25/+45°C
Storage temperature	-25/+60°C
Max relative humidity	95%
Admitted overload	200% 2 min.
Harmonic distortion	None introduced
Colour	RAL 7035
Protection degree	IP21
Instrumentation	– Input & output digital multimeter with RS485 port – LCD display – Reactive power regulator
Installation	Indoor
Regulator overload protection	Digital control
Communication system	Ethernet / GPRS / USB / MODBUS TCP/IP
Overvoltage protection	– Class I input surge arrestor – Class II output surge arrestor – Optimal voltage return through supercapacitors in case of blackout
Total protection and by-pass kit	– Input automatic circuit breaker – By-pass switch made of an interlocked automatic circuit breaker – Output interlocked motorized automatic circuit breaker with protection against overload, overvoltage, undervoltage, phase sequence error and phase failure
Integrated automatic power factor correction system	– Based on high energy density metallised polypropylene three-phase capacitors ($U_n = 525V$) – Three-phase blocking reactor (tuning frequency 180Hz)

* The 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.

Sirius Advance

three-phase
60-4000kVA

Accessories

Input isolating transformer
EMI/RFI filters
Neutral point reactor
IP54 protection degree for indoor and outdoor installation

Rating in relation to the input variation percentage

±15%	±20%	±25%	±30%	+15%/-35%	+15%/-45%
125	100	80	60	80	60
160	125	100	80	100	80
200	160	125	100	125	100
250	200	160	125	160	125
320	250	200	160	200	160
400	320	250	200	250	200
500	400	320	250	320	250
630	500	400	320	400	320
800	630	500	400	500	400
1000	800	630	500	630	500
1250	1000	800	630	800	630
1600	1250	1000	800	1000	800
2000	1600	1250	1000	1250	1000
2500	2000	1600	1250	1600	1250
3200	2500	2000	1600	2000	1600
4000	3200	2500	2000	2500	2000

Sirius Advance voltage stabilisers derive from the SIRIUS type, of which they maintain the main technical characteristics.

The standard integration of some functions and accessories usually offered as optional, **complete** and **enrich** the equipment.

The **additional features** are:

- Input automatic circuit breaker;
- Bypass switch via an interlocked automatic circuit breaker;
- Output interlocked motorized automatic circuit breaker;
- Integrated automatic power factor correction system.

The input **automatic circuit breaker** (QF1) ensures protection against failure and/or short-circuits inside the unit.

The **bypass automatic circuit breaker** (QF2) protects the line supplying the load against overload and shortcircuits in bypass condition.

The **output motorized automatic circuit breaker** (QF3), interlocked with the bypass switch, protects against overload, short-circuit, overvoltage, undervoltage, phase sequence error and phase failure.

The **integrated automatic Power Factor Correction system** maintains the power factor value ($\cos \phi$) to a high level ensuring the known advantages for the users but also affecting the sizing of the stabiliser.

The PFC system exploits **high energy density metallised polypropylene three-phase capacitors (Un=525V)** exclusively thus guaranteeing **robustness** and **reliability**. The addition of blocking reactors (detuned filters) eliminates undesired harmonics and protects the capacitors.

The reactive power controller is mounted on the external control synoptic panel.



Sirius Advance

three-phase
60-4000kVA



Wide range

- symmetrical: $\pm 15\%$, $\pm 20\%$, $\pm 25\%$, $\pm 30\%$ (other on request)
- asymmetrical: $+15\%/-35\%$, $+15\%/-45\%$ (other on request)

Output voltage accuracy: $\pm 0.5\%$.



Technology

Control and stabilisation, performed on the **true RMS** value, are based on two **two-way DSP-microprocessor** operating with a software specifically developed for Ortea and under the supervision provided by a third **microprocessor (bodyguard)**.

Parameters and reference voltage can be **set** via a **PC**, thus allowing for solving any problems related to voltage stability directly in the field.

Independent regulation on each phase.



Long life

Ortea system voltage regulator with **rollers** (without brushes, which are subject to heavy wear & tear).

Columnar voltage regulator make possible to achieve **high ratings** (up to 6000kVA) and a solid and reliable construction



Long life

Extended warranty: **5 years**.



Protection

The stabiliser is provided of an **electronic** voltage regulator **protection system** activates in case of overload on the voltage regulator.

In such conditions, the **load supply is not interrupted**.

The auxiliary circuit is protected by **fuses**.



Protection

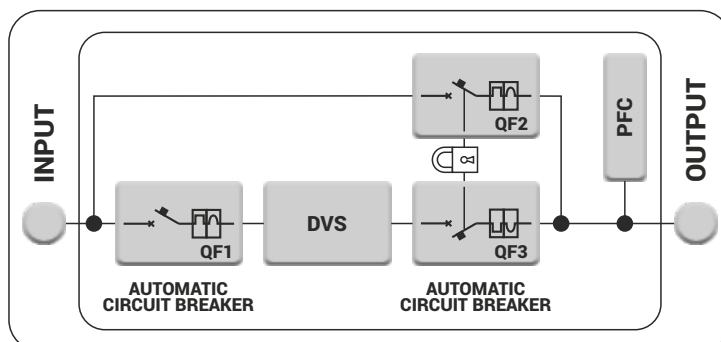
Overvoltage protection:

- Class I input **surge arrestor**.
- Class II output **surge arrestor**.



Protection

Output voltage reset to the minimum value in case of blackout by means of **supercapacitors** banks in order to ensure the correct shutdown.



Sirius Advance

three-phase
60-4000kVA



Protection

Total protection by-pass kit:

- Input automatic circuit breaker
- By-pass automatic circuit breaker
- Output motorized automatic circuit breaker



Instrumentation

Two **multi-task digital analyser** mounted on the front panel and fitted with RS485 port (linked and phase voltage current, frequency, power factor, active power, reactive power, apparent power etc.).



Power Factor Correction

The PFC system exploits **high energy density metallized polypropylene three-phase capacitors** ($U_n = 525V$) exclusively thus guaranteeing **robustness** and **reliability**.

The addition of blocking reactors (**detuned filters**) eliminates undesired harmonics and protects the capacitors.



Power Factor Correction

The **reactive power regulator** RPC are designed to provide the desired power factor while minimizing the wearing on the banks of capacitors, accurate and reliable in measuring and control functions are simple and intuitive in installation and construction.



Monitoring

The local **display** embedded in the front panel enables the visualization of **operating mode** and setting data.

The stabiliser **operating mode** can be easily **monitored** by means of the **LEDs** on the front panel, which provide with **information** and **alarms**.



Monitoring

Monitoring activities can be run remotely by installing on a PC (connected to the stabiliser via Ethernet) the **STABIMON software** provided with the unit.

It is also possible to communicate with the stabiliser with the **Modbus TCP/IP** protocol.



Monitoring

The control system is able to interface with the **Internet** thanks to its capability to connect with **Ethernet** and **Gprs** protocols.

This allows for a remote monitoring of the equipment made by Ortea at its headquarters, thus guaranteeing **prompt assistance** worldwide.



Sirius Advance

three-phase
60-4000kVA

Type	Input voltage variation range	Rating	Input voltage range	Maximum input current	Output voltage $\pm 0.5\%$	Output current	Efficiency	Speed regulation	Cabinet	Weight
	[%]	[kVA]	[V]	[A]	[V]	[A]	[%]	[ms/V]	Type	[kg]

Input voltage variation range $\pm 20\%/\pm 15\%$ (the values listed in the table are referred to 400V nominal voltage)

100-20	± 20	100	320-480	180	400	144	>98	15	47	880
125-15	± 15	125	340-460	213	400	181	>98	20	47	900
125-20	± 20	125	320-480	226	400	181	>98	15	47	900
160-15	± 15	160	340-460	272	400	231	>98	20	48	1150
160-20	± 20	160	320-480	289	400	231	>98	15	48	1150
200-15	± 15	200	340-460	340	400	289	>98	20	48	1220
200-20	± 20	200	320-480	361	400	289	>98	15	48	1220
250-15	± 15	250	340-460	425	400	361	>98	20	48	1450
250-20	± 20	250	320-480	452	400	361	>98	15	48	1450
320-15	± 15	320	340-460	544	400	462	>98	20	50	1700
320-20	± 20	320	320-480	578	400	462	>98	15	50	1700
400-15	± 15	400	340-460	680	400	578	>98	20	57	1880
400-20	± 20	400	320-480	722	400	578	>98	15	57	1880
500-15	± 15	500	340-460	851	400	723	>98	20	64	2200
500-20	± 20	500	320-480	903	400	723	>98	15	64	2200
630-15	± 15	630	340-460	1071	400	910	>98	20	64	2720
630-20	± 20	630	320-480	1138	400	910	>98	18	64	2720
800-15	± 15	800	340-460	1360	400	1156	>98	24	72	2950
800-20	± 20	800	320-480	1445	400	1156	>98	18	72	2950
1000-15	± 15	1000	340-460	1700	400	1445	>98	24	73	4240
1000-20	± 20	1000	320-480	1806	400	1445	>98	18	73	4240
1250-15	± 15	1250	340-460	2125	400	1806	>98	24	74	5500
1250-20	± 20	1250	320-480	2258	400	1806	>98	18	74	5500
1600-15	± 15	1600	340-460	2720	400	2312	>98	24	75	5980
1600-20	± 20	1600	320-480	2890	400	2312	>98	18	75	5980
2000-15	± 15	2000	340-460	3400	400	2890	>98	24	85	7840
2000-20	± 20	2000	320-480	3613	400	2890	>98	22	85	7840
2500-15	± 15	2500	340-460	4251	400	3613	>98	30	87	9600
2500-20	± 20	2500	320-480	4516	400	3613	>98	22	87	9600
3200-15	± 15	3200	340-460	5440	400	4624	>98	30	87	9600
3200-20	± 20	3200	320-480	5780	400	4624	>98	27	95	12800
4000-15	± 15	4000	340-460	6800	400	5780	>98	36	95	12800

Sirius Advance

three-phase
60-4000kVA

Type	Input voltage variation range	Rating	Input voltage range	Maximum input current	Output voltage $\pm 0.5\%$	Output current	Efficiency	Speed regulation	Cabinet	Weight
	[%]	[kVA]	[V]	[A]	[V]	[A]	[%]	[ms/V]	Type	[kg]

Input voltage variation range $\pm 30\%/\pm 25\%$ (the values listed in the table are referred to 400V nominal voltage)

60-30	± 30	60	280-520	124	400	87	>98	10	47	880
80-25	± 25	80	300-500	154	400	116	>98	12	47	900
80-30	± 30	80	280-520	165	400	116	>98	10	47	900
100-25	± 25	100	300-500	193	400	144	>98	12	48	1150
100-30	± 30	100	280-520	206	400	144	>98	10	48	1150
125-25	± 25	125	300-500	241	400	181	>98	12	48	1220
125-30	± 30	125	280-520	258	400	181	>98	10	48	1220
160-25	± 25	160	300-500	308	400	231	>98	12	48	1450
160-30	± 30	160	280-520	330	400	231	>98	10	48	1450
200-25	± 25	200	300-500	385	400	289	>98	12	50	1700
200-30	± 30	200	280-520	413	400	289	>98	10	50	1700
250-25	± 25	250	300-500	482	400	361	>98	12	57	1880
250-30	± 30	250	280-520	516	400	361	>98	10	57	1880
320-25	± 25	320	300-500	617	400	462	>98	12	64	2200
320-30	± 30	320	280-520	661	400	462	>98	10	64	2200
400-25	± 25	400	300-500	770	400	578	>98	12	64	2720
400-30	± 30	400	280-520	826	400	578	>98	12	64	2720
500-25	± 25	500	300-500	963	400	723	>98	15	72	2950
500-30	± 30	500	280-520	1032	400	723	>98	12	72	2950
630-25	± 25	630	300-500	1214	400	910	>98	15	73	4240
630-30	± 30	630	280-520	1300	400	910	>98	12	73	4240
800-25	± 25	800	300-500	1541	400	1156	>98	15	74	5500
800-30	± 30	800	280-520	1651	400	1156	>98	12	74	5500
1000-25	± 25	1000	300-500	1927	400	1445	>98	15	75	5980
1000-30	± 30	1000	280-520	2064	400	1445	>98	12	75	5980
1250-25	± 25	1250	300-500	2408	400	1806	>98	15	85	7840
1250-30	± 30	1250	280-520	2580	400	1806	>98	15	85	7840
1600-25	± 25	1600	300-500	3083	400	2312	>98	18	87	9600
1600-30	± 30	1600	280-520	3303	400	2312	>98	15	87	9600
2000-25	± 25	2000	300-500	3853	400	2890	>98	18	95	12800
2000-30	± 30	2000	280-520	4130	400	2892	>98	18	95	12800
2500-25	± 25	2500	300-500	4817	400	3613	>98	22	95	12800

Sirius Advance

three-phase
60-4000kVA

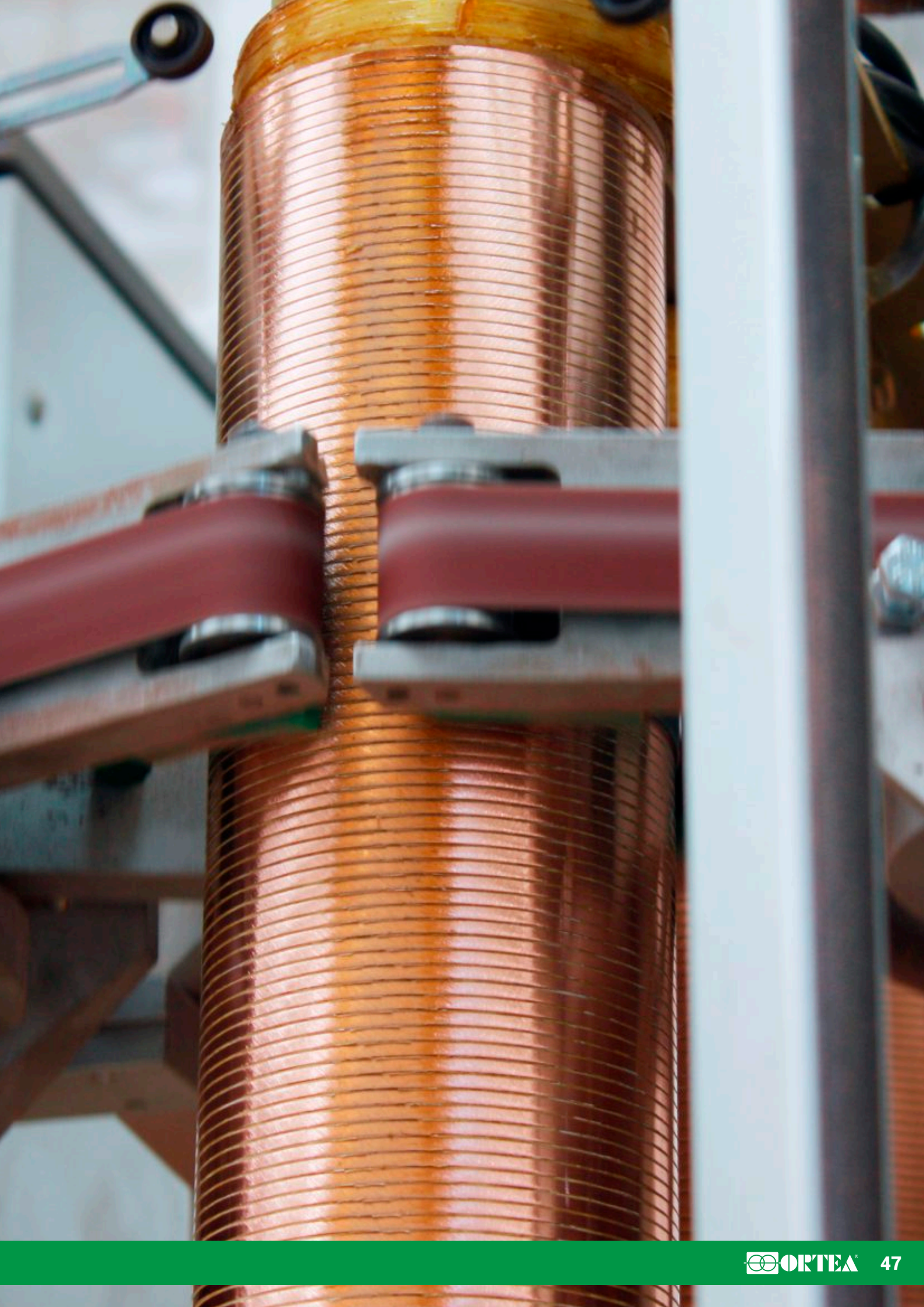
Type	Input voltage variation range	Rating	Input voltage range	Maximum input current	Output voltage $\pm 0.5\%$	Output current	Efficiency	Speed regulation	Cabinet	Weight
	[%]	[kVA]	[V]	[A]	[V]	[A]	[%]	[ms/V]	Type	[kg]

Input voltage variation range **+15%/-35%** (the values listed in the table are referred to 400V nominal voltage)

80-15/35	+15/-35	80	260-460	178	400	116	>98	12	47	1000
100-15/35	+15/-35	100	260-460	222	400	144	>98	12	47	1030
125-15/35	+15/-35	125	260-460	278	400	181	>98	12	48	1300
160-15/35	+15/-35	160	260-460	356	400	231	>98	12	48	1420
200-15/35	+15/-35	200	260-460	444	400	289	>98	12	48	1650
250-15/35	+15/-35	250	260-460	556	400	361	>98	12	58	2100
320-15/35	+15/-35	320	260-460	711	400	462	>98	12	58	2220
400-15/35	+15/-35	400	260-460	889	400	578	>98	12	65	2600
500-15/35	+15/-35	500	260-460	1111	400	723	>98	15	65	3420
630-15/35	+15/-35	630	260-460	1400	400	910	>98	15	71	3700
800-15/35	+15/-35	800	260-460	1778	400	1156	>98	15	73	5040
1000-15/35	+15/-35	1000	260-460	2223	400	1445	>98	15	74	5950
1250-15/35	+15/-35	1250	260-460	2779	400	1806	>98	15	76	6480
1600-15/35	+15/-35	1600	260-460	3557	400	2312	>98	18	86	9540
2000-15/35	+15/-35	2000	260-460	4446	400	2890	>98	18	95	11350
2500-15/35	+15/-35	2500	260-460	5558	400	3613	>98	22	C30	15500

Input voltage variation range **+15%/-45%** (the values listed in the table are referred to 400V nominal voltage)

60-15/45	+15/-45	60	220-460	158	400	87	>98	10	47	1080
80-15/45	+15/-45	80	220-460	211	400	116	>98	10	47	1130
100-15/45	+15/-45	100	220-460	262	400	144	>98	10	48	1450
125-15/45	+15/-45	125	220-460	329	400	181	>98	10	48	1520
160-15/45	+15/-45	160	220-460	420	400	231	>98	10	48	1800
200-15/45	+15/-45	200	220-460	525	400	289	>98	10	58	2300
250-15/45	+15/-45	250	220-460	656	400	361	>98	10	58	2420
320-15/45	+15/-45	320	220-460	840	400	462	>98	10	65	2800
400-15/45	+15/-45	400	220-460	1051	400	578	>98	12	65	3720
500-15/45	+15/-45	500	220-460	1315	400	723	>98	12	71	4050
630-15/45	+15/-45	630	220-460	1655	400	910	>98	12	73	5440
800-15/45	+15/-45	800	220-460	2102	400	1156	>98	12	74	6400
1000-15/45	+15/-45	1000	220-460	2627	400	1445	>98	12	76	6980
1250-15/45	+15/-45	1250	220-460	3284	400	1806	>98	15	86	10540
1600-15/45	+15/-45	1600	220-460	4204	400	2312	>98	15	C30	12400
2000-15/45	+15/-45	2000	220-460	5254	400	2890	>98	18	C30	16800



three-phase
100-4000A



Standard features	OPTInet	OPTInet Plus	OPTInet Advance
Voltage stabilisation	Independent phase control		
Output voltage selectable via display, PC and/or Ethernet*	from 210V to 230V (L-N) from 360V to 400V (L-L)		
Frequency	50/60Hz $\pm 5\%$		
Admitted load variation	Up to 100%		
Admitted load imbalance	100%		
Cooling	Natural air ventilation. Up to 35°C aided with fans		
Ambient temperature	-25/+45°C		
Storage temperature	-25/+60°C		
Max relative humidity	95%		
Admitted overload	200% 2 min.		
Harmonic distortion	None introduced		
Colour	RAL 7035		
Protection degree	IP21		
Instrumentation	<ul style="list-style-type: none"> – Input & output digital multimeter with RS485 port – LCD display 		<ul style="list-style-type: none"> – Input & output digital multimeter with RS485 port – LCD display – Reactive power regulator
Installation	Indoor		
Regulator overload protection	Digital control		
Communication system	Ethernet / GPRS / USB / MODBUS TCP/IP		
Overvoltage protection	<ul style="list-style-type: none"> – Class I input surge arrestor – Class II output surge arrestor – Optimal voltage return through supercapacitors in case of black-out 		
Protection against electromagnetic / radio-frequency noise	EMI/RFI filter		
Total protection by-pass kit	<ul style="list-style-type: none"> – Input automatic circuit breaker – By-pass switch made of an interlocked automatic circuit breaker – Output interlocked motorized automatic circuit breaker with protection against overload, overvoltage, undervoltage, phase sequence error and phase failure 		
Integrated automatic power factor correction system	<ul style="list-style-type: none"> – Based on high energy density metallised polypropylene three-phase capacitors ($U_n = 525V$) – Three-phase blocking reactor (180Hz) 		

* The 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.



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Accessories

Input isolating transformer

Neutral point reactor

IP54 protection degree for indoor and outdoor installation

OPTInet has been specifically designed to meet the ever increasing **power quality** issues that can be easily found in a wide range of industrial applications.

OPTInet combines the established and consolidated characteristics proper of ORTEA voltage stabilisers with features that enable the achievement of **energy saving** and **power quality** improvement. One of the factors that most affect energy saving is given by the fact that electrical appliances are usually designed to operate with an input voltage included in range rather than just one nominal voltage. Nevertheless, supplying a device a voltage **higher than the rated one** implies **higher consumption** and decrease of the expected life.

For example, supplying resistive loads 240V instead of 230V implies approximately 10% increase in the power consumption

This situation can be found worldwide due to the fact that several distribution systems are rated for a **voltage higher than 400V** (United Kingdom, Australia, parts of India, and so on): OPTInet provide with a practical and efficient answer to such issue.

Furthermore, higher supplying voltage might induce problems in magnetic components (possibility of magnetic core saturation).

Other factors such as proximity to power plants or distribution stations and voltage supplied at high level to cover the far end of distribution lines might affect performance of the supplied loads and energy bills.

In order to **optimise energy consumption**, the first step is a **load survey** performed by a qualified technician aiming at assessing the existing situation, deciding what steps need to be taken and **estimating the potential energy savings**. The survey is made necessary by the fact that not all loads are voltage-sensitive.

To sum up, the main parameters that allow for the estimation of the energy saving are:

- Mains voltage different from the load nominal one: the higher the difference, the better the energy saving.
- Level of load sensitivity to voltage variations.

An accurate analysis shall allow for the **best solution** in terms of design and rating. In some cases, it could be more sensible and economical to install an optimiser only for specific types of loads.

All OPTInet devices are fitted with a EMI/RFI filter to protect against electromagnetic/radio-frequency noise.

OPTInet is specifically designed to allow the adjustment of the voltage received from the mains and bring it back to the value for which the load has been built. OPTInet optimises the load performance, thus obtaining **lower consumption, energy saving, cost reduction** and longer life expectancy.

OPTInet is available in three configurations:

- **OPTInet**: base version with adjustment and stabilisation of the output voltage.
- **OPTInet Plus**: version fitted with by-pass system made of three interlocked automatic circuit breakers.
- **OPTInet Advance**: top of the range type fitted with by-pass circuit and automatic power factor correction system.



Type of load sensitivity to the voltage variation

●	Incandescent, fluorescent and discharge lamps	Consumed power is in this case directly proportional to the square of the supply voltage and the load can be defined as voltage dependant. Using an optimiser can extend the expected life of the load by preventing the supplying voltage from being higher than the nominal one.
●	LED lamps	No advantage with these lamps due to the fact that they are supplied a constant voltage.
●	Asynchronous motor	Low rating motors (typically under 20/25kW), widely spread at a level both domestic and industrial, are considered as voltage dependant.
●	Inverter driven asynchronous motors	If the motor is driven by an inverter (speed electronic control) then it becomes voltage independent.
●	Production lines	Usually, voltage dependant loads (low rating motors and heating systems) are mixed with voltage independent loads (electronic devices). Only a careful investigation can establish the energy savings entity. A typical application is provided by the refrigerating banks used in supermarkets, made of combination of small motors directly fed by electronic units.
●	Electronic devices	Small equipment such as computers, office machines and telecom systems are generally fed via power supplies, which are insensitive to voltage variation.

● a little sensitive to voltage variation / ● sensitive to voltage variation

Type	Nominal current	Rating @ 415V	Selectable output voltage (±0.5%)	Efficiency	Speed regulation	Cabinet	Weight
	[A]	[kVA]	[V]	[%]	[ms/V]	Type	[kg]

OPTInet

OPTInet 100	100	72	360-400	>98	12	51	490
OPTInet 125	125	90	360-400	>98	12	51	580
OPTInet 160	160	115	360-400	>98	15	54	670
OPTInet 200	200	145	360-400	>98	15	55	900
OPTInet 250	250	180	360-400	>98	15	55	950
OPTInet 320	320	230	360-400	>98	15	55	1050
OPTInet 400	400	290	360-400	>98	15	55	1300
OPTInet 500	500	360	360-400	>98	15	53	1400
OPTInet 630	630	450	360-400	>98	15	62	1700
OPTInet 800	800	575	360-400	>98	18	62	2200
OPTInet 1000	1000	720	360-400	>98	18	63	2400
OPTInet 1250	1250	900	360-400	>98	18	64	3000
OPTInet 1600	1600	1150	360-400	>98	18	70	4000
OPTInet 2000	2000	1450	360-400	>98	18	70	4300
OPTInet 2500	2500	1800	360-400	>98	22	80	6000
OPTInet 3200	3200	2300	360-400	>98	22	80	7300
OPTInet 4000	4000	2900	360-400	>98	27	90	11000

Type	Nominal current	Rating @ 415V	Selectable output voltage (±0.5%)	Efficiency	Speed regulation	Cabinet	Weight
	[A]	[kVA]	[V]	[%]	[ms/V]	Type	[kg]

OPTInet Plus

OPTInet Plus 100	100	72	360-400	>98	20	41	590
OPTInet Plus 125	125	90	360-400	>98	20	41	680
OPTInet Plus 160	160	115	360-400	>98	20	44	770
OPTInet Plus 200	200	145	360-400	>98	20	47	1010
OPTInet Plus 250	250	180	360-400	>98	20	47	1075
OPTInet Plus 320	320	230	360-400	>98	20	47	1175
OPTInet Plus 400	400	290	360-400	>98	20	56	1470
OPTInet Plus 500	500	360	360-400	>98	20	52	1570
OPTInet Plus 630	630	450	360-400	>98	20	63	1900
OPTInet Plus 800	800	575	360-400	>98	20	63	2400
OPTInet Plus 1000	1000	720	360-400	>98	20	64	2600
OPTInet Plus 1250	1250	900	360-400	>98	24	66	3630
OPTInet Plus 1600	1600	1150	360-400	>98	24	72	4640
OPTInet Plus 2000	2000	1450	360-400	>98	30	72	4950
OPTInet Plus 2500	2500	1800	360-400	>98	30	82	6730
OPTInet Plus 3200	3200	2300	360-400	>98	30	83	8400
OPTInet Plus 4000	4000	2900	360-400	>98	30	92	12200

OPTInet Advance

OPTInet Advance 100	100	72	360-400	>98	20	47	690
OPTInet Advance 125	125	90	360-400	>98	20	47	780
OPTInet Advance 160	160	115	360-400	>98	20	53	900
OPTInet Advance 200	200	145	360-400	>98	20	56	1150
OPTInet Advance 250	250	180	360-400	>98	20	56	1220
OPTInet Advance 320	320	230	360-400	>98	20	50	1450
OPTInet Advance 400	400	290	360-400	>98	20	50	1700
OPTInet Advance 500	500	360	360-400	>98	20	57	1880
OPTInet Advance 630	630	450	360-400	>98	20	64	2200
OPTInet Advance 800	800	575	360-400	>98	20	64	2720
OPTInet Advance 1000	1000	720	360-400	>98	20	65	2950
OPTInet Advance 1250	1250	900	360-400	>98	24	72	4240
OPTInet Advance 1600	1600	1150	360-400	>98	24	73	5500
OPTInet Advance 2000	2000	1450	360-400	>98	30	73	5980
OPTInet Advance 2500	2500	1800	360-400	>98	30	82	7840
OPTInet Advance 3200	3200	2300	360-400	>98	30	84	9600
OPTInet Advance 4000	4000	2900	360-400	>98	30	93	12800



Energy saving

Load voltage optimization ending in performance improvement, increase of the equipment life expectancy and overall cost reduction.



Power Quality

Continuous voltage monitoring and regulation to a stable value aimed at providing for the optimum supply protected from potential electromagnetic and radio-frequency noise.



Long life

Ortea system voltage regulator with **rollers** (without brushes, which are subject to heavy wear & tear). **Columnar voltage regulator** make possible to achieve **high ratings** (up to 6000kVA) and a solid and reliable construction



Technology

Control and stabilisation, performed on the **true RMS** value, are based on two **two-way DSP-microprocessor** operating with a software specifically developed for Ortea and under the supervision provided by a third **microprocessor (bodyguard)**. **Parameters** and reference voltage can be **set** via a **PC**, thus allowing for solving any problems related to voltage stability directly in the field.

Independent regulation on each phase.



Protection

The stabiliser is provided of an **electronic** voltage regulator **protection system** activates in case of overload on the voltage regulator.

In such conditions, the **load supply is not interrupted**.

The auxiliary circuit is protected by **fuses**.



Protection

Overvoltage protection:

- Class I input **surge arrestor**.
- Class II output **surge arrestor**.



Protection

Output voltage reset to the minimum value in case of blackout by means of **supercapacitors** banks in order to ensure the correct shutdown.



Protection

Total protection by-pass kit (only for OPTInet Plus & Advance):

- Input automatic circuit breaker
- By-pass automatic circuit breaker
- Output motorized automatic circuit breaker



Instrumentation

Two **multi-task digital analyser** mounted on the front panel and fitted with RS485 port (linked and phase voltage current, frequency, power factor, active power, reactive power, apparent power etc.).



Power Factor Correction (only for OPTInet Advance)

The PFC system exploits **high energy density metallized polypropylene three-phase capacitors** ($U_n = 525V$) exclusively thus guaranteeing **robustness** and **reliability**.
The addition of blocking reactors (**detuned filters**) eliminates undesired harmonics and protects the capacitors.



Power Factor Correction (only for OPTInet Advance)

The **reactive power regulator** RPC are designed to provide the desired power factor while minimizing the wearing on the banks of capacitors, accurate and reliable in measuring and control functions are simple and intuitive in installation and construction.



Monitoring

The local **display** embedded in the front panel enables the visualization of **operating mode** and setting data.

The stabiliser **operating mode** can be easily **monitored** by means of the **LEDs** on the front panel, which provide with **information** and **alarms**.



Monitoring

Monitoring activities can be run remotely by installing on a PC (connected to the stabiliser via Ethernet) the **STABIMON software** provided with the unit.

It is also possible to communicate with the stabiliser with the **Modbus TCP/IP** protocol.

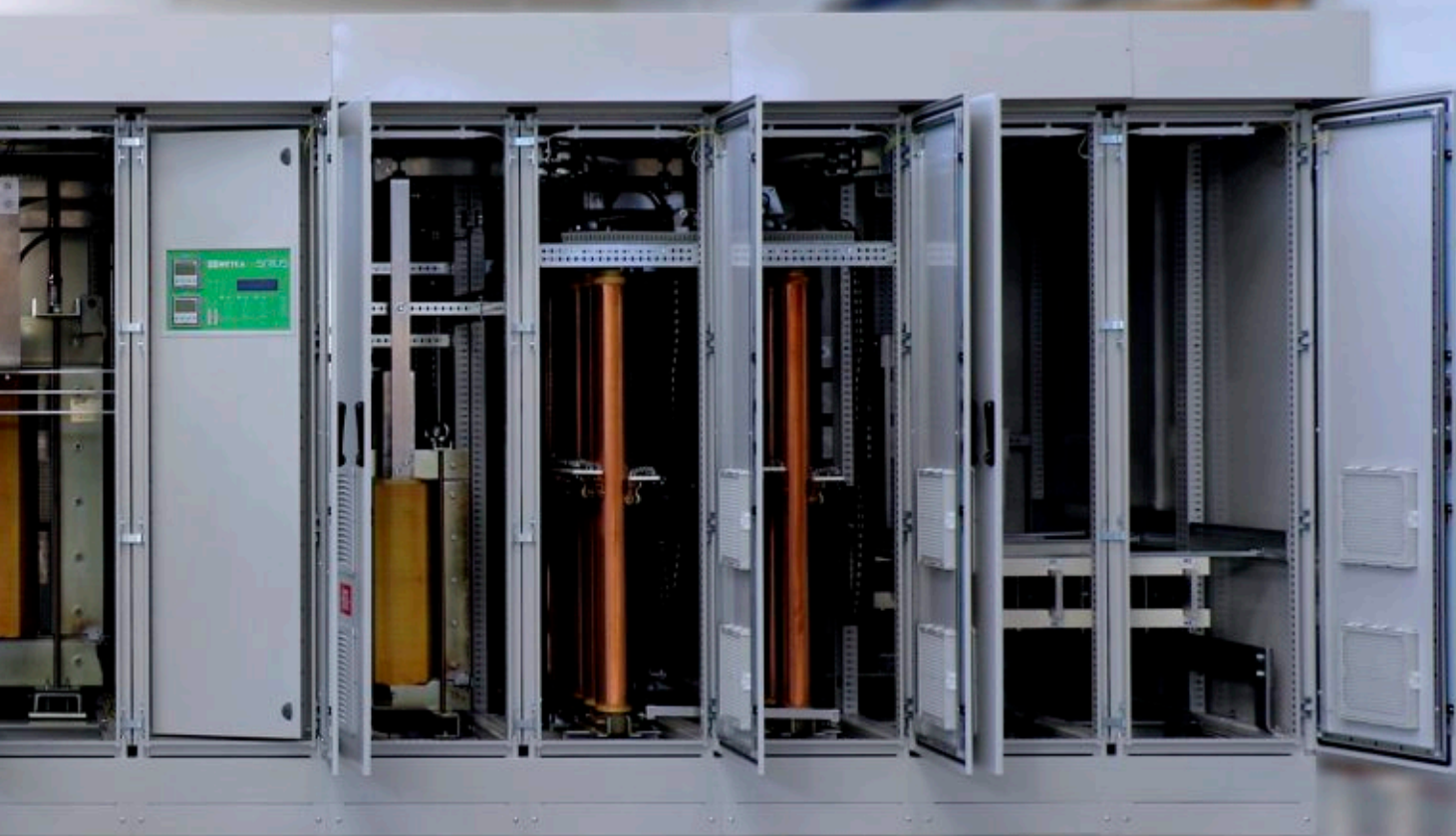


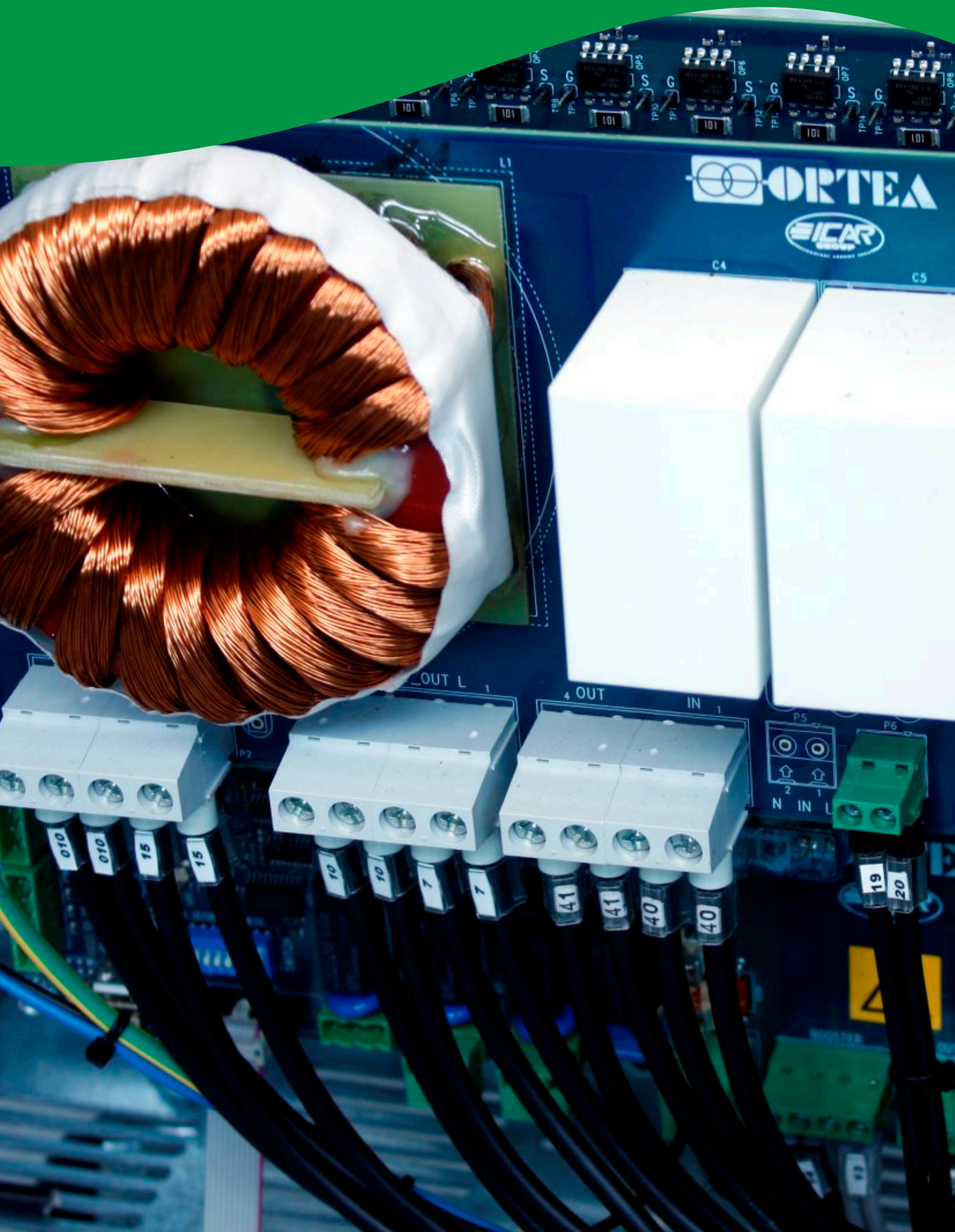
Monitoring

The control system is able to interface with the **Internet** thanks to its capability to connect with **Ethernet** and **Gprs** protocols.

This allows for a remote monitoring of the equipment made by Ortea at its headquarters, thus guaranteeing **prompt assistance** worldwide.







Static digital voltage stabilisers

The **static stabiliser** is used when the **correction speed** represents the critical issue (for example, computers, laboratory equipment, measuring benches and medical instrumentation).

The stabilisers are designed and built in compliance with the European Directives concerning CE marking (Low Voltage Directive and Electromagnetic Compatibility Directive).

The voltage stabiliser can operate with **input and output voltage different** (380V/415V) from the rated voltage (400V). Such setting can be performed at the factory or at the Customer's premises according to the instructions given in the handbook. The stabiliser operates with a **load variation range** for each phase **from 0 to 100%** and **is not affected by the power factor of the load**.

The standard cabinet is an IP21 metal enclosure with RAL7035 finish for indoor installation.

The operating principle is similar to the one described for the electro-mechanical stabilisers. The difference lies in the fact that the **voltage compensation** on the buck/boost primary winding is performed by an electronic board through **IGBT static switches** instead of the autotransformer with variable transformer ratio.

The **microprocessor**-based system monitors the output voltage and determines the opening/closing of the IGBT switch ensuring the best regulation.

The **Gemini** series is provided with a display (run by the control system microprocessor) showing output voltage and alarm signals. The **Aquarius** series is provided with an output digital multimeter.

Main standard components:

- Multi-tap autotransformer.
- Input automatic circuit breaker.
- Manual maintenance bypass.
- Automatic protection bypass (in the control board).
- Microprocessor-based control and command system.
- IGBT-based power regulation circuit.
- Input EMI/RFI filter.
- Output Class II surge arrestors.
- Digital display or multimeter.

Accessories

- Isolating transformer.
- IP54 cabinet for outdoor installation.

Gemini	Single-phase	4-40kVA
Aquarius	Three-phase	10-120kVA



Gemini

single-phase
4-40kVA



Standard features

Voltage regulation	IGBT control
Selectable output voltage*	220-230-240V
Frequency	50-60Hz $\pm 5\%$
Admitted load variation	Up to 100%
Cooling	Forced ventilation
Ambient temperature	-25/+45°C
Storage temperature	-25/+60°C
Max relative humidity	95%
Admitted overload	150% 2 sec.
Harmonic distortion	None introduced
Colour	RAL 7035
Protection degree	IP21
Instrumentation	Output digital voltmeter
Installation	Indoor
Overvoltage protection	Output class II surge arrestor
Protection	<ul style="list-style-type: none"> – Input automatic circuit breaker – Automatic by-pass protection – Manual maintenance by-pass

* The 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.



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Gemini

single-phase
4-40kVA

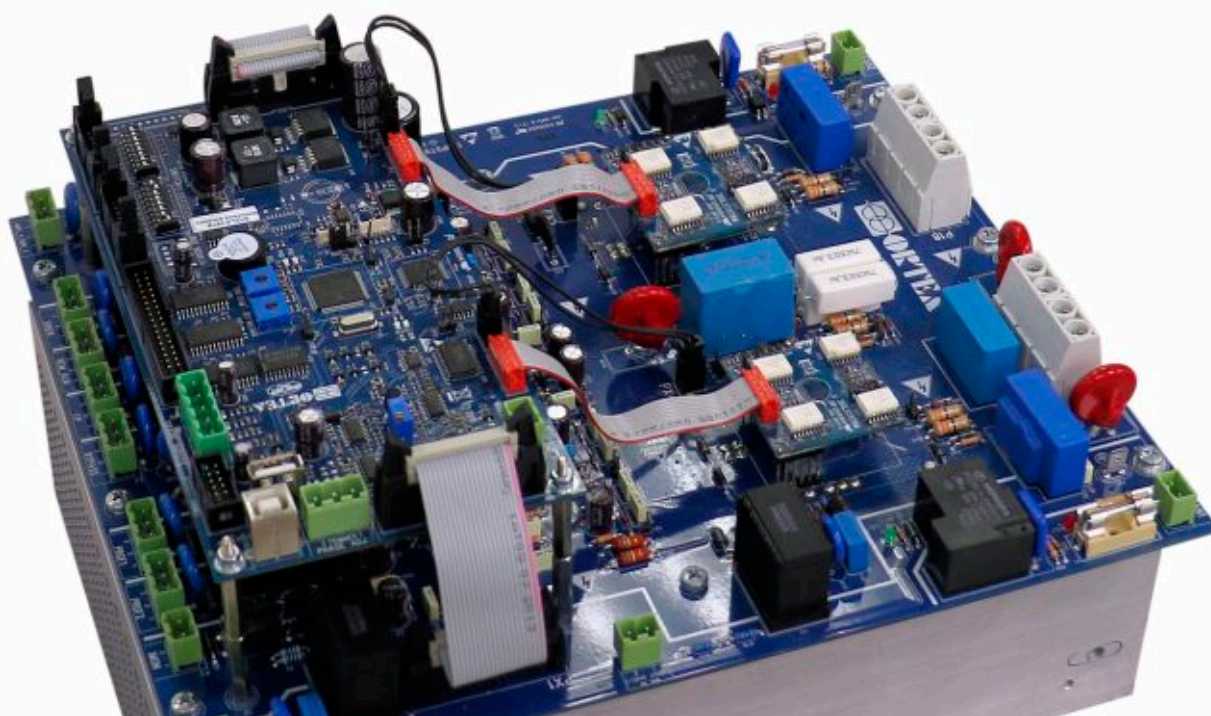
Type	Input voltage variation range	Rating	Input voltage range	Maximum input current	Output voltage $\pm 0.5\%$	Output current	Efficiency	Correction time	Cabinet	Weight
	[%]	[kVA]	[V]	[A]	[V]	[A]	[%]	[ms/V]	Type	[kg]

Input voltage variation range $\pm 20\%/\pm 15\%$ (the values listed in the table are referred to 230V nominal voltage)

ES7-20	± 20	7	184-276	38	230	30	>98	mezzo ciclo	13	32
ES10-15	± 15	10	195-265	51	230	43	>98	mezzo ciclo	13	40
ES10-20	± 20	10	184-276	54	230	43	>98	mezzo ciclo	13	40
ES15-15	± 15	15	195-265	76	230	65	>98	mezzo ciclo	22	57
ES15-20	± 20	15	184-276	81	230	65	>98	mezzo ciclo	22	57
ES20-15	± 15	20	195-265	102	230	87	>98	mezzo ciclo	23	80
ES20-20	± 20	20	184-276	109	230	87	>98	mezzo ciclo	23	80
ES30-15	± 15	30	195-265	153	230	130	>98	mezzo ciclo	23	95
ES30-20	± 20	30	184-276	163	230	130	>98	mezzo ciclo	23	95
ES40-15	± 15	40	195-265	205	230	174	>98	mezzo ciclo	23	95

Input voltage variation range $\pm 30\%/\pm 25\%$ (the values listed in the table are referred to 230V nominal voltage)

ES4-30	± 30	4	161-300	25	230	17	>98	mezzo ciclo	13	32
ES5-25	± 25	5	172-288	29	230	22	>98	mezzo ciclo	13	40
ES5-30	± 30	5	161-300	31	230	22	>98	mezzo ciclo	13	40
ES7-25	± 25	7	172-288	40	230	30	>98	mezzo ciclo	22	57
ES7-30	± 30	7	161-300	44	230	30	>98	mezzo ciclo	22	57
ES10-25	± 25	10	172-288	57	230	43	>98	mezzo ciclo	23	80
ES10-30	± 30	10	161-300	62	230	43	>98	mezzo ciclo	23	80
ES15-25	± 25	15	172-288	87	230	65	>98	mezzo ciclo	23	95
ES15-30	± 30	15	161-300	93	230	65	>98	mezzo ciclo	23	95
ES20-25	± 25	20	172-288	116	230	87	>98	mezzo ciclo	23	95





Aquarius

three-phase
10-120kVA



Standard features

Voltage regulation	IGBT control
Voltage stabilisation	Independent phase control
Selectable output voltage*	220-230-240V (L-N) / 380-400-415V (L-L)
Frequency	50-60Hz $\pm 5\%$
Admitted load variation	Up to 100%
Cooling	Forced ventilation
Ambient temperature	-25/+45°C
Storage temperature	-25/+60°C
Max relative humidity	95%
Admitted overload	150% 2 sec.
Harmonic distortion	None introduced
Colour	RAL 7035
Protection degree	IP21
Instrumentation	Output digital multimeter
Installation	Indoor
Overvoltage protection	Output class II surge arrestor
Protection	<ul style="list-style-type: none"> – Input automatic circuit breaker – Automatic by-pass protection – Manual maintenance by-pass

* The 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.



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Aquarius

three-phase
10-120kVA

Type	Input voltage variation range	Rating	Input voltage range	Maximum input current	Output voltage $\pm 0.5\%$	Output current	Efficiency	Correction time	Cabinet	Weight
	[%]	[kVA]	[V]	[A]	[V]	[A]	[%]	[ms/V]	Type	[kg]

Input voltage variation range **$\pm 20\%/\pm 15\%$** (the values listed in the table are referred to 400V nominal voltage)

ET20-20	± 20	20	320-480	36	400	29	>98	mezzo ciclo	23	130
ET30-15	± 15	30	340-460	51	400	43	>98	mezzo ciclo	23	170
ET30-20	± 20	30	320-480	54	400	43	>98	mezzo ciclo	23	170
ET45-15	± 15	45	340-460	76	400	65	>98	mezzo ciclo	31	200
ET45-20	± 20	45	320-480	81	400	65	>98	mezzo ciclo	31	200
ET60-15	± 15	60	340-460	102	400	87	>98	mezzo ciclo	35	250
ET60-20	± 20	60	320-480	109	400	87	>98	mezzo ciclo	35	250
ET90-15	± 15	90	340-460	153	400	130	>98	mezzo ciclo	35	300
ET90-20	± 20	90	320-480	162	400	130	>98	mezzo ciclo	35	300
ET120-15	± 15	120	340-460	204	400	173	>98	mezzo ciclo	35	300

Input voltage variation range **$\pm 30\%/\pm 25\%$** (the values listed in the table are referred to 400V nominal voltage)

ET10-30	± 30	10	280-520	20	400	14	>98	mezzo ciclo	23	130
ET15-25	± 25	15	300-500	29	400	22	>98	mezzo ciclo	23	170
ET15-30	± 30	15	280-520	31	400	22	>98	mezzo ciclo	23	170
ET20-25	± 25	20	300-500	39	400	29	>98	mezzo ciclo	31	200
ET20-30	± 30	20	280-520	41	400	29	>98	mezzo ciclo	31	200
ET30-25	± 25	30	300-500	57	400	43	>98	mezzo ciclo	35	250
ET30-30	± 30	30	280-520	61	400	43	>98	mezzo ciclo	35	250
ET45-25	± 25	45	300-500	86	400	65	>98	mezzo ciclo	35	300
ET45-30	± 30	45	280-520	93	400	65	>98	mezzo ciclo	35	300
ET60-25	± 25	60	300-500	116	400	87	>98	mezzo ciclo	35	300

Accessories

The characteristics described so far are relevant to the standard voltage stabilisers.

Accessories to perform specific tasks are available on request.

Combinations of one or more of the accessories listed in the following might result in an increase of the stabiliser overall dimensions and weight.

Accessories
Interrupting devices
Load protection against over/undervoltage
Manual by-pass line
Total protection kit
Input isolating transformer
Integrated automatic power factor correction system
SPD surge arrestor
EMI/RFI filters
Neutral point reactor
IP54 protection degree for indoor and outdoor installation

Interrupting devices

Every voltage stabiliser can be fitted with an automatic circuit breaker with thermal and magnetic release on the input and/or on the output. The input breaker protects the stabiliser and the downstream line against potential short-circuits on the input line. The output breaker protects the stabiliser against potential overload. The input breaker is sized according to the maximum input current, whilst the output one is sized in relation to the stabiliser rated current.

Nominal current	Breaking capacity	Additional module	
		Length	Weight
[A]	[kA]	[mm]	[kg]

10	6	not needed	
16	6	not needed	
20	6	not needed	
25	6	not needed	
32	6	not needed	
40	6	not needed	
50	6	not needed	
63	6	not needed	
80	10	not needed	
100	16	not needed	
125	16	not needed	
160	25	not needed	
200	36	not needed	
250	36	not needed	

Nominal current	Breaking capacity	Additional module	
		Length	Weight
[A]	[kA]	[mm]	[kg]

320	36	not needed	
400	36	not needed	
500	36	not needed	
630	36	not needed	
800	50	not needed	
1000	50	not needed	
1250	50	not needed	
1600	50	not needed	
2000	65	600	90
2500	65	600	90
3200	85	600	90
4000	85	600	90
5000	100	1200	200
6300	100	1200	200



Load protection against over/undervoltage

This circuit offers a double protection by:

- delaying the connection to the load each time the stabiliser switches on, so that the user can undergo a smooth start-up with an already stabilised voltage;
- protecting the load from surges, sags and overload by disconnecting the load from the stabiliser.

The protection intervenes when the output voltage is outside the set range (with regard to the rated value). When the supply goes back to the regular value, the load is automatically re-connected. Up to 320A, the protection is obtained with contactors. From 400A upwards, an automatic motorised circuit breaker is used.

The protection must be sized according to the stabiliser nominal current.

Nominal current	Additional module	
	Length	Weight
[A]	[mm]	[kg]

10	not needed	
16	not needed	
20	not needed	
25	not needed	
32	not needed	
40	not needed	
50	not needed	
63	not needed	
80	not needed	
100	not needed	
125	not needed	
160	not needed	
200	not needed	
250	not needed	

Nominal current	Additional module	
	Length	Weight
[A]	[mm]	[kg]

320	not needed	
400	not needed	
500	not needed	
630	not needed	
800	not needed	
1000	not needed	
1250	not needed	
1600	not needed	
2000	600	90
2500	600	90
3200	600	90
4000	1200	200
5000	1200	200
6300	1200	200



Manual by-pass line

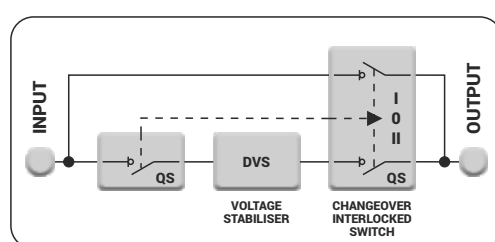
The bypass circuit enables the stabiliser to be segregated from the line supplying the load.

The operator can therefore access the internal components and perform maintenance or repairing sessions without having to disconnect the load.

For the duration of the bypass condition, the load is directly fed by the mains: the voltage is therefore not stabilised.

The by-pass line configuration can be:

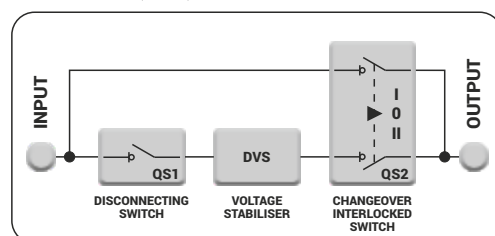
1. – I-O-II changeover interlocked switch (QS)



Nominal current	Additional module	
	Length	Weight
[A]	[mm]	[kg]

10	not needed	
16	not needed	
20	not needed	
25	not needed	
32	not needed	
40	not needed	
50	not needed	
63	not needed	
80	not needed	
100	not needed	

2. – Input disconnecting switch (QS1) – Output I-O-II changeover interlocked switch (QS2)



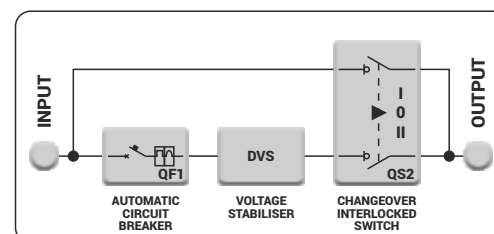
Nominal current	Additional module	
	Length	Weight
[A]	[mm]	[kg]

125	400	70
160	400	70
200	400	70
250	400	70

Nominal current	Additional module	
	Length	Weight
[A]	[mm]	[kg]

320	400	70
400	400	70
500	400	70
630	600	90
800	600	90
1000	600	90
1250	600	90
1600	600	90
2000	1200	200
2500	1200	200

3. – Input automatic circuit breaker (QF1) – Output I-O-II changeover interlocked switch (QS2)



Nominal current	Additional module	
	Length	Weight
[A]	[mm]	[kg]

125	400	70
160	400	70
200	400	70
250	400	70
320	400	70
400	400	70
500	600	90
630	600	90
800	600	90
1000	600	90
1250	600	90
1600	1200	200
2000	1200	200
2500	1200	200

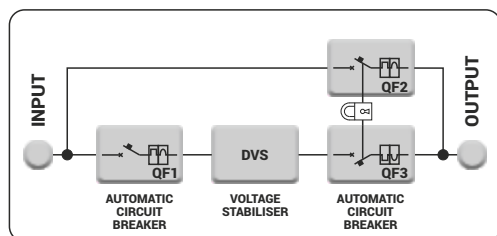
Total protection kit

The total protection kit includes:

- Input automatic circuit breaker (QF1).
- Bypass switch made of an interlocked automatic circuit breaker (QF2).
- Output interlocked motorized automatic circuit breaker (QF3).

The input automatic circuit breaker protects against potential faults and/or short-circuits inside the unit. The bypass switch with automatic circuit breaker protects the load supplying line against overload and short-circuits in bypass condition. The output motorized circuit breaker (interlocked with the bypass circuit breaker) protects against overload, shortcircuit, overvoltage, undervoltage, phase sequence error and phase failure

The total protection kit must be chosen according to the stabiliser maximum input current



QF1: Input automatic circuit breaker.

QF2: Bypass switch made of an interlocked automatic circuit breaker.

QF3: Output automatic circuit breaker.

QF3 is interlocked with QF2 by means of an individual key. When one of the breakers is closed, the other one is open and the closing spring cannot be manually loaded.

Current		Additional module	
Input	Output	Length	Weight
[A]	[A]	[mm]	[kg]
200	160	400	100
250	200	400	100
320	250	400	110
400	320	400	125
500	400	400	125
630	500	400	125
800	630	600	170
1000	800	600	200
1250	1000	600	200
1600	1250	600	200
2000	1600	1200	630
2500	2000	1200	640
3200	2500	1200	650
4000	3200	1200	730
5000	4000	1800	1100
6300	5000	1800	1200





Input isolating transformer

The input isolation transformer is the best solution to provide for:

- galvanic separation between the stabiliser and the mains;
- delta/star or delta/zig-zag connection in order to cancel the 3rd and triplen harmonics and improve the balance of the phase voltages;
- generation of a fixed and steady neutral point;
- protection from overvoltage generated by connecting/disconnecting manoeuvres on the line.

The transformer is fitted with electrostatic screen between primary and secondary winding. It is also possible to have high insulation level (10kV) between input and output.

The input isolating transformer must be chosen according to the stabiliser maximum input current.

Single-phase transformer for VEGA & ANTARES			
Current	Power	Cabinet (TRS+DVS)	Additional weight
[A]	[kVA]	[tipo]	[kg]
8	2	13	48
13	3	13	59
21	5	22	79
34	8	22	95
43	10	23	110
52	12	23	113
65	15	23	115
86	20	23	125
108	25	31	135
130	30	31	150
173	40	40	160
217	50	40	220
273	63	40	240
304	70	40	260
347	80	2x40	285
391	90	2x40	300
435	100	2x41	335
478	110	2x41	355
543	125	2x41	400
770	175	2x41	455

Dyn11 three-phase transformer for ORION			
Current	Power	Cabinet (TRS+DVS)	Additional weight
[A]	[kVA]	[tipo]	[kg]
17	12	31	135
21	15	31	145
28	20	31	170
36	25	40	205
43	30	40	225
57	40	40	290
72	50	2x40	335
91	63	2x40	365
101	70	2x40	370
115	80	2x40	395

Dzn0 three-phase transformer for ORION PLUS, SIRIUS & SIRIUS ADVANCE			
Current	Power	Cabinet (TRS+DVS)	Additional weight
[A]	[kVA]	[tipo]	[kg]
130	90	54	430
144	100	54	580
158	110	54	600
180	125	54	630
202	140	54	660
231	160	54	710
260	180	54	750
289	200	54	800
325	225	55	910
361	250	55	960
404	280	55	1020
462	320	55	1070
505	350	55	1120
578	400	55	1210
650	450	55	1290
722	500	55	1430
910	630	61	1700
1156	800	61	2000
1445	1000	61	2450
1806	1250	62	3100
2312	1600	62	3600
2890	2x1000	63	4900
3612	2x1250	63	5800
4650	2x1600	80	7200
5780	2x2000	80	8600
7250	2x2500	91	10600

Integrated automatic power factor correction system

A PFC system can be integrated in the same cabinet with a voltage stabiliser, offering the stabilisation and the correction of the power factor of the plant in the same solution. The result is a stabilised supply to the load and a higher power factor of the load itself, with the advantage of having available the maximum active power.

ORTEA PFC systems exploit high energy density metallised polypropylene three-phase capacitors ($U_n=525V$) exclusively thus guaranteeing robustness and reliability. Furthermore, the detuned filter protects the system against possible harmonics generated by non-linear loads.

DVS power	PHF power	Additional module	
		Length	Weight
[kVA]	[kvar]	[mm]	[kg]

80	44	400	85
100	69	400	115
125	69	400	115
160	69	400	115
200	94	400	135
250	125	600	160
320	150	600	175
400	175	600	190
500	225	600	210

DVS power	PHF power	Additional module	
		Length	Weight
[kVA]	[kvar]	[mm]	[kg]

630	300	600	260
800	350	600	295
1000	450	1200	485
1250	550	1200	520
1600	700	1200	580
2000	900	1800	770
2500	1100	1800	920
3200	1300	2400	1110
4000	1600	2400	1320

SPD surge arrestor

SPD arrestors protect the load and the stabiliser against voltage peaks of atmospheric or operational origin by discharging them to ground.

The installation depends on the system configuration. For example, in case of high ratings the suggested sequence would be: spark-gap arresters followed by an isolating device (ideally an isolating transformer) and varistor-based arresters on the output.

Current	Type	Discharge current	
[A]			

CLASS I	ORTEA	50kA	single-phase+N
CLASS I	ORTEA	50kA	three-phase+N
CLASS II	ORTEA	40kA	single-phase+N
CLASS II	ORTEA	40kA	three-phase+N

Current	Type	Discharge current	
[A]			

CLASS I	DEHN	100kA	single-phase+N
CLASS I	DEHN	200kA	three-phase+N
CLASS II	DEHN	40kA	single-phase+N
CLASS II	DEHN	40kA	three-phase+N

EMI/RFI filters

The addition of EMI/RFI filters is a valid solution to remove the electromagnetic interferences generated by many electronic devices (converters, switching power supplies, motor drives, etc.).

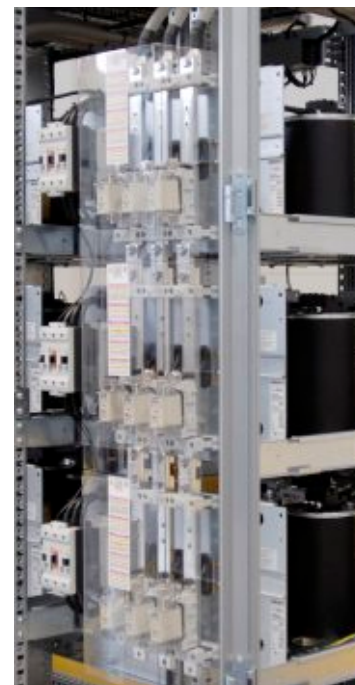
The EMI/RFI filters must be chosen according to the stabiliser rated output current.

Type	Rated current
	[A]

FL170.50.00	50
FL170.100.00	100
FL170.150.00	150
FL170.300.00	300
FL170.500.00	500

Type	Rated current
	[A]

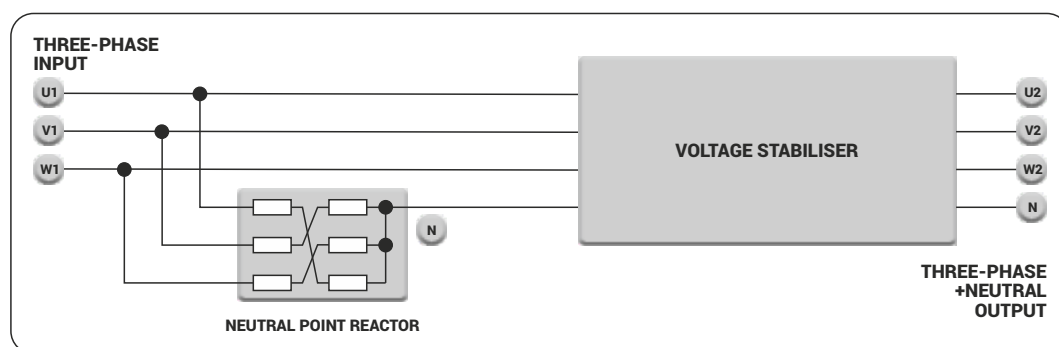
FL155.800.00	800
FL155.1000.00	1000
FL155.1600.00	1600
FL155.2500.00	2500





Neutral point reactor

The neutral point reactor creates a reference neutral for the system when the input AC mains does not include the neutral connection or when a stable neutral is required to supply the load. The neutral point inductor is available for all the voltage stabilisers.



IP54 protection degree for indoor and outdoor installation

IP54 indoor installation: These units are equipped with air conditioning units to ensure the correct ventilation and cooling of the internal magnetic and electrical components. The cabinet is completely sealed: this makes the stabiliser suitable for operating in damp and dusty environments.

IP54 outdoor installation: ORTEA's stabilisers are also available for outdoor installation.



Cabinets size

Type	Dimensions [mm]		
	W	D	H
11	210	400	200
12	300	460	300
13	300	560	300
21	300	500	900
22	410	530	1200
23	410	680	1200
31	600	600	1600
32	600	600	2000
33	800	600	2000
35	800	600	1800
36	1200	600	1600
37	1200	600	2000
40	600	800	1600
41	1000	800	1800
43	1200	800	1600
44	2000	800	2000
46	1800	800	1600
47	1600	800	1800
48	2200	800	1800
49	2200	800	2000
50	2400	800	1800
51	600	800	1800
52	1800	800	2000
53	1200	800	2000
54	600	800	2000
55	1200	800	1800
56	1800	800	1800
57	2400	800	2000
58	3000	800	2000
59	3600	800	2100

Type	Dimensions [mm]		
	W	D	H
60	600	1000	1800
61	1200	1000	1800
62	1800	1000	2000
63	2400	1000	2000
64	3000	1000	2000
65	3600	1000	2000
66	4200	1000	2000
67	1200	1000	2000
70	3600	1000	2100
71	4200	1000	2100
72	4800	1000	2100
73	5400	1000	2100
74	6000	1000	2100
75	6600	1000	2100
76	7200	1000	2100
80	3600	1400	2200
81	4200	1400	2200
82	4800	1400	2200
83	5400	1400	2200
84	6000	1400	2200
85	6600	1400	2200
86	7200	1400	2200
87	7800	1400	2200
90	4200	2000	2400
91	5400	2000	2400
92	6000	2000	2400
93	6600	2000	2400
94	7200	2000	2400
95	8400	2000	2400
C20	6000	2400	2400
C30	9000	2400	2400
HC40	12000	2400	2700



«Special» voltage stabiliser

Beside designing and manufacturing **customised stabilisers** tailored on the Customer's requirements, ORTEA developed product series particularly thought and **optimised** for **specific necessities and/or applications**.

Here below is a list summarizing said series.

BTS series	Telecommunication (TLC)
DLC series	Line conditioners
BC series	Broadcasting
AOT series	Mains filters
OUTDOOR series	Outdoor installations
F&B series	Food & Beverage, packaging and bottling industry

BTS series

The acronym **BTS** stands for **Base Transceiver Station** and is used to indicate all the transmitting and receiving devices that enable the radio coverage in a telecom cell.

This is definitely an application where **high quality voltage supply**, regardless of the incoming fluctuation, is very often the key for ensuring **efficiency** and **reliability**, fundamental qualities to guarantee operating continuity.

Disrupted service, loss of data, security failure, inaccurate information and general inconvenience are examples of possible problems caused by unstable supply. Of course, all this results in increased costs.

A **voltage stabiliser** is a device able to respond to changes in the voltage level on the input line caused by sags (due to undersized distribution lines, connection of large loads to the network, ground faults, etc.) and surges (generated by disconnection of large loads, increased voltage at the generating plant, atmospheric events, etc.) The duration of such phenomena depends on their cause and is not easily predictable. Sags are generally more common especially where the distribution is not efficient

The voltage stabiliser **specifically designed for BTS** sites has proved to be an efficient solution in the telecommunication field.

In comparison to a standard voltage stabiliser, a BTS unit offers the following characteristics:

- IP54 metallic enclosure for outdoor installation.
- Manual by-pass.
- Input and output circuit breakers.
- Input digital voltmeter.
- Output Class II surge arrestors.
- Optional isolating transformer.

The stabilisers can be single-phase, three-phase or specifically designed for receiving a three-phase input and releasing a single-phase output. With the three-phase configuration, the regulation is performed independent on each phase and the voltage stabiliser requires the neutral wire presence for a correct operation. If the neutral wire is not available, the addition of a D/Y isolating transformer or neutral-point reactor is required.

Three-phase stabilisers can be used with three-phase loads and up to 100% unbalanced single-phase loads, even in case of asymmetric mains.

The **instrumentation** is installed on the cabinet door. An output digital multimeter provides with information on the line downstream the voltage stabiliser (phase and linked voltages, current, power factor, active power, apparent power, reactive power, etc).

Minimum voltage, maximum voltage, internal overheating and overload on the voltage regulator are signalled by an acoustic alarm.

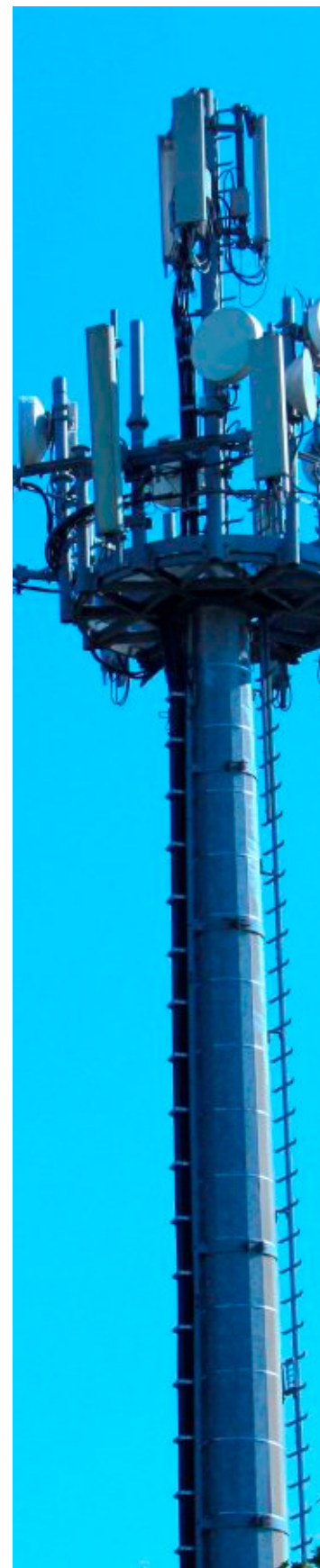
The stabiliser exploits a **microprocessor-based control** logic.

Main features

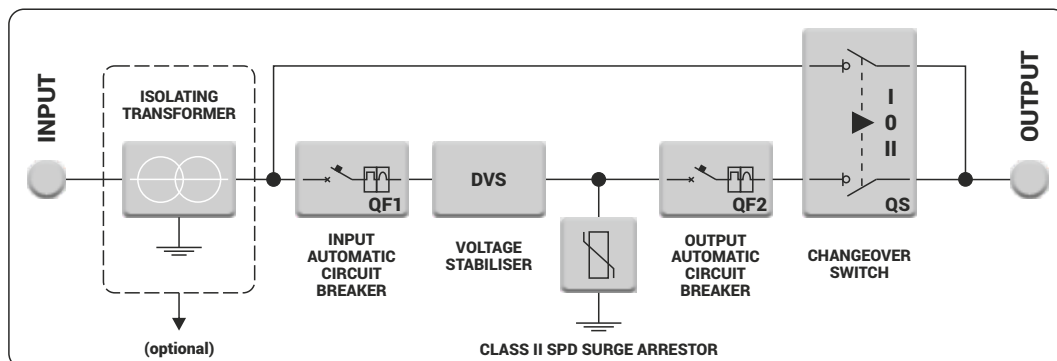
- Power design based on the maximum input current.
- Regulation based on the «rms voltage» and insensitivity to harmonics on the mains.
- Full functionality with load charge variable from 0 to 100%.
- Up to 30% harmonic content admitted on the load current.
- Insensitivity to the load power factor.
- No generation of noticeable harmonics in the output voltage.

Protections and signals

- Motor rotation stop due to regulation reaching the limit switches.
- Maximum and minimum line voltage alarm.
- Ambient thermostat (set to 65°C).
- Automatic circuit breaker to protect the voltage regulator.
- Fuses to protect the auxiliary circuits.
- Class II surge arrestors.



BTS series



Standard features	BTS1	BTS3	BTS3/1
Number of phases	1	3	3/1
Output voltage*	220-230-240V (L-N)	380-400-415V (L-L)	380-400-415V (L-L) input 220-230-240V (L-N) output
Nominal rating	from 5kVA to 80kVA		
Input voltage range	$\pm 15\%$ - $\pm 20\%$ - $\pm 25\%$ - $\pm 30\%$ - $+15\%$ - -25% - $+15\%$ - -35% - $+15\%$ - -45%		
Output voltage range	$\pm 0.5\%$		
Frequency	50-60Hz $\pm 5\%$		
Admitted load variation	Up to 100%		
Admitted load imbalance	n.a.	100%	n.a.
Cooling	Natural air ventilation (air extraction over 35°C)		
Ambient temperature	-25/+45°C		
Storage temperature	-25/+60°C		
Maximum relative humidity	95%		
Admitted overload	200% 2 min.		
Harmonic distortion	None introduced		
Colour	RAL 7035		
Protection degree	IP54		
Installation	Outdoor		
Overvoltage protection	class II surge arrestor		

* The 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.



All ORTEA stabilisers 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 9001:2008 Standards. The commitment towards environmental issues and safety at work matters is guaranteed by the certification of the Management System according to the ISO 14001:2004 and OHSAS 18001:2007 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 do hold therefore any contractual value.

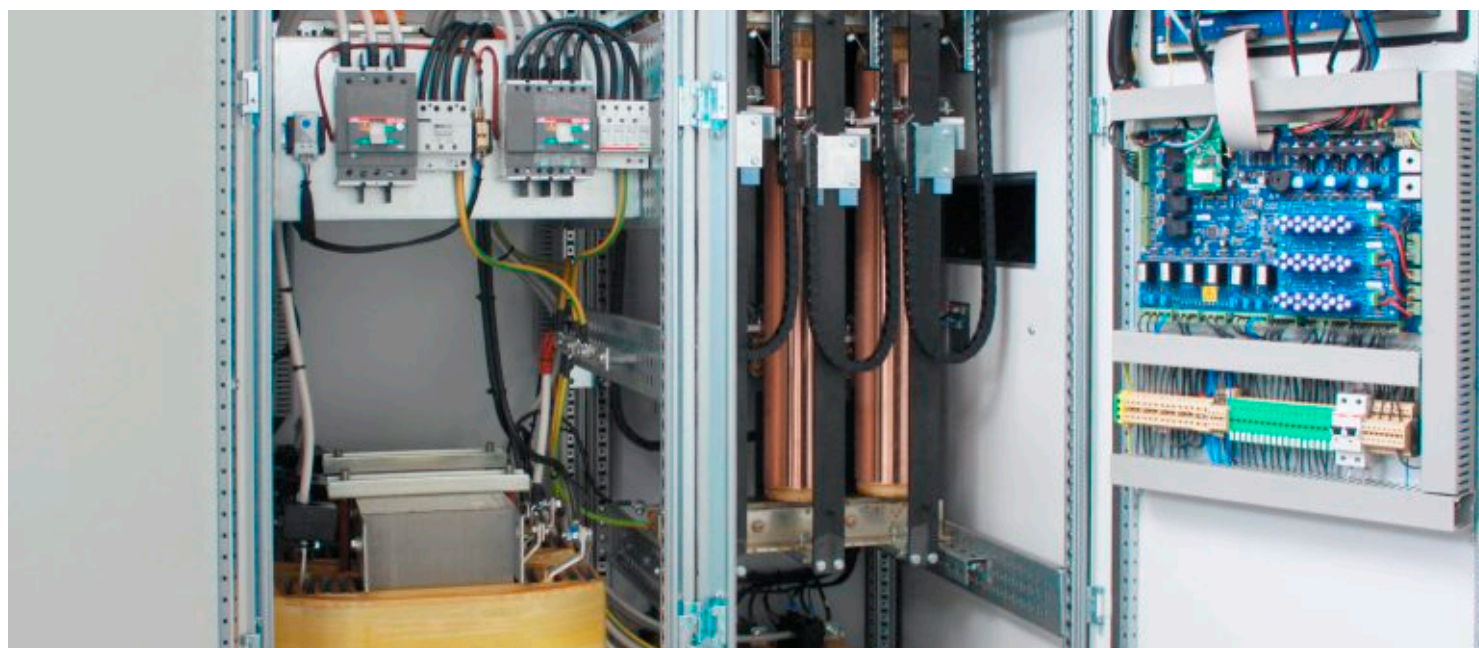
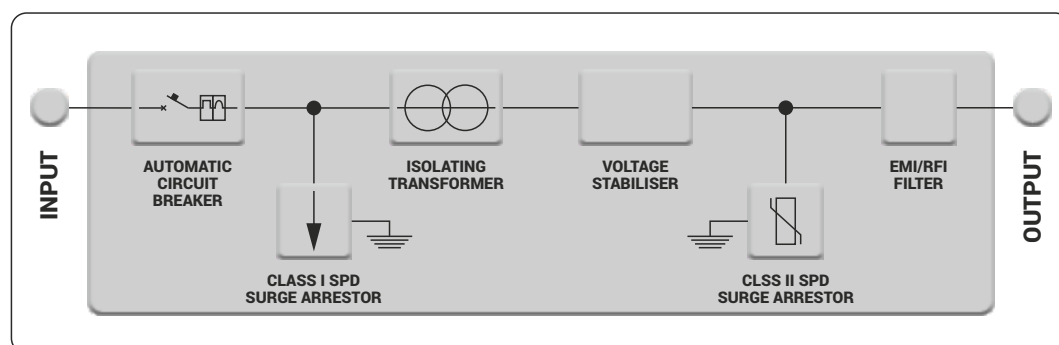
DLC series

ORTEA product range is completed by a range of **line conditioners** based on voltage stabilisers and **provided with additional protective devices**.

The following sketch shows the typical line conditioners:

- **Input automatic circuit breaker** (protection against short-circuit).
- Delta/Star or Delta/Zig-zag **input isolation transformer** (complete galvanic isolation between the mains and the load and cancellation of third and triplen harmonics).
- **Class 1 SPD surge protective device** (protection against lightning).
- **Class 2 SPD surge protective device** (protection against transients).
- **EMI/RFI filter** (protection against electro-magnetic and radio-frequency noise).

Lybra	Single-phase	Vega/Antares	+ advanced protection	0.3-135kVA
Aries	Three-phase	Orion	+ advanced protection	2-250kVA
Aries Plus	Three-phase	Orion Plus	+ advanced protection	30-1250kVA
Discovery	Three-phase	Sirius	+ advanced protection	60-6000kVA



BC series

The acronym **DVB** stands for Digital Video Broadcasting and is used to indicate all the devices transmitting and receiving digital signal. The availability of **high quality voltage supply** is the key for ensuring operating continuity.

The BC series is specifically designed for DVB stations and consists of a **digital voltage stabiliser** able to compensate for voltage variation on the input line generated by sags or surges, completed by **additional devices** for the **protection** against transients and electric noise generated by electronic appliances.

Usually, a BC stabiliser includes

- Digital voltage stabiliser.
- Isolating transformer.
- Input & output automatic circuit breakers.
- Input Class I surge arrestors.
- Output Class II surge arrestors.
- EMI/RFI filter.
- Instrumentation (voltmeter/multimetre).

For outdoor installation, the unit is housed in side an **IP54 metallic enclosure**.

Small ratings can be assembled in enclosures suitable for installation in **19" rack cabinets**.



AOT series

AOTs (wave absorbers) are obtained by assembling in a cabinet a combination of **protective devices** to deal with **transients** carried by the distributing lines.

In order to achieve the most complete protection level, the AOT combines two complementary concepts: **smoothing** and **filtering**. The task is performed through surge arrestors, isolating transformers, detuning reactors and capacitors.

AOTs must be installed upstream and in series to the equipment that needs protection in order to avoid inductive and /or capacitive effects on the lines.

Usually, AOTs include:

- Input automatic circuit breaker.
- Parallel surge arrestors (redundant system).
- Isolating transformer.
- Capacitors.
- Detuning/blocking reactor
- Output automatic circuit breaker.

The operation can be divided in three phases:

1. The surge arrestors discharge to ground the direct overvoltage energy.
2. The isolating transformer ensures galvanic isolation between the mains and the equipment to be protected.
3. The filtering module eliminates the residual energy.



OUTDOOR series

All ORTEA voltage stabilisers can be assembled in cabinets specifically designed for **outdoor installation**.

The standard outdoor cabinets are built for an **IP54** protection degree and are painted with powder paint for **C3** anti-corrosion class (C4 on request).

On request, ORTEA is also able to provide with units destined to be installed in particularly aggressive environments (for example, AISI304 and AISI316 stainless steel cabinets).



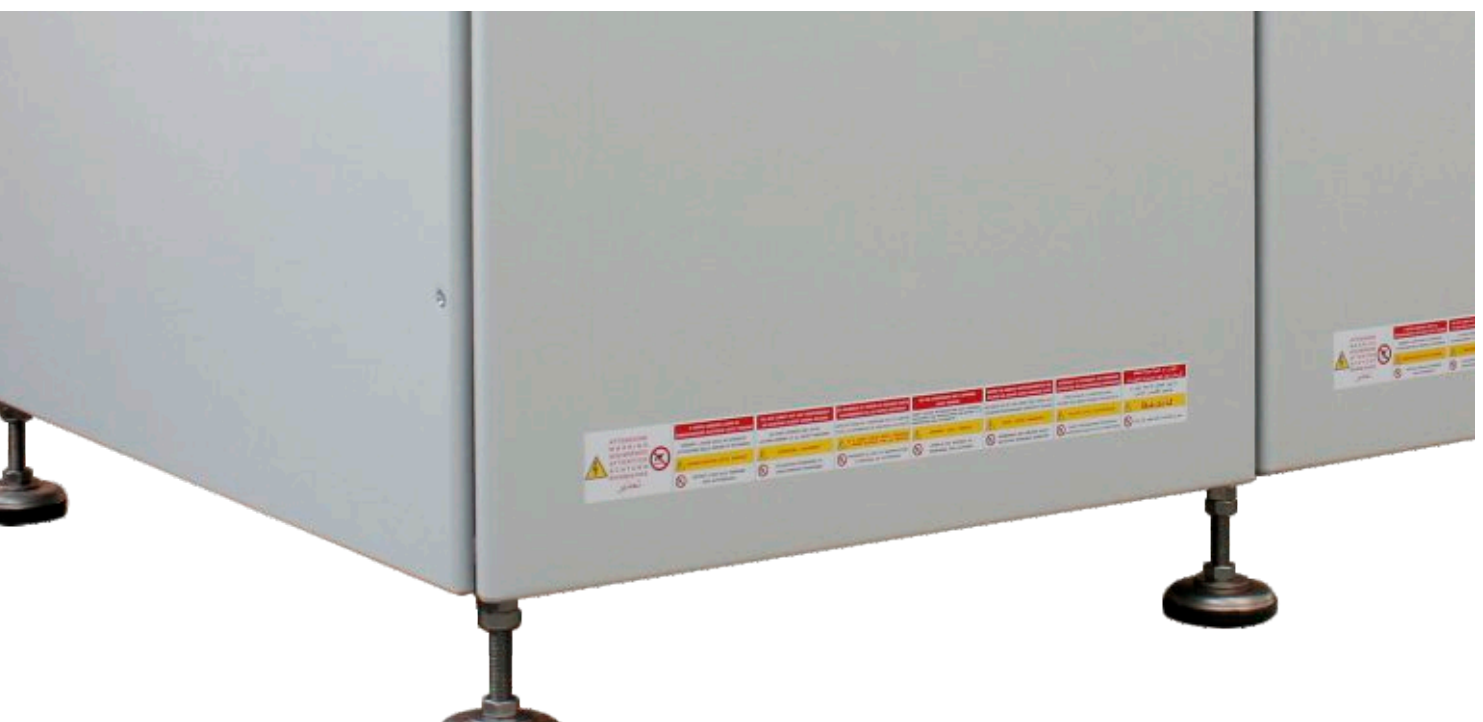
F&B series

Specifically designed for **food & beverage, packaging** and **bottling industries**, these voltage stabilisers are housed in an **IP54** cabinet cooled via **air conditioning units**.

The stabiliser is therefore protected against dust or other volatile substances and liquid sprays.

The configuration includes **raised feet**, so that normal cleaning routines can be performed underneath the stabiliser.

On request, the cabinet can be in **stainless steel**.



Warranty terms

1.1 Warranty

The purchased equipment is under warranty against any material or workmanship defects that might occur within the terms indicated in the following starting from the date of purchase and for all mechanical, electrical and electronic parts.

During the warranty period, the Manufacturer will repair or replace any defective parts, unless said defects are due to:

- improper handling, storage and/or use;
- wear & tear resulting from normal usage;
- incompetence or negligence on the Buyer's side when installing, running and maintaining the unit;
- interventions performed by or on behalf of the Buyer without written authorization;
- failure to comply with instructions given by the Manufacturer;
- removal, alteration or forgery of the nameplate and the data indicated thereof; and
- fortuitous or force majeure events such as (but not limited to) fire, earthquake, flood, riot and revolution, war, political instability, terroristic act, strike, etc.).

Moreover, the provided warranty will immediately become null and void in case of:

- failure to comply with the payment terms;
- failure to carry out routine and / or extraordinary maintenance;
- improper use of the equipment; and
- external phenomena beyond the unit's scope and control.

In case of failure, the Buyer shall contact the Head Office where the Manufacturer will decide whether the repair can be performed on location, or if the equipment has to be shipped to the Manufacturer's facilities or to an after-sale Service Centre authorised by the Manufacturer.

If the repairing intervention can be performed at the Buyer's facility, all the expenses relevant to travelling, boarding and lodging of the Seller personnel shall be at the Buyer's charge, whilst spare parts and labour costs shall be at the Manufacturer's charge. However, the Buyer shall produce copy of the purchasing document (invoice) and report the detected anomaly prior to the intervention.

If the intervention is performed at the Manufacturer's facility, the equipment shall be duly packed and shipped back at the Buyer's expense and risk. The shipment after the repairing operations shall be under the Manufacturer's responsibility.

Unless otherwise agreed upon in writing, this warranty does not cover the replacement of the entire equipment under no circumstances whatsoever. Nothing shall be due to the Buyer for the time in which the equipment is left idle. The Buyer may not claim any compensations and/or reimbursements for expenses or indirect damages caused by the equipment failure.

Parts provided as spare parts and/or replacements are subject to the same warranty terms. Repair or replacement of a defective part does not extend the original warranty period on the product as a whole.

The competent place of jurisdiction for any disputes is in Monza (Italy).

1.2 Proper use

While the unit is functioning, the operator must be protected from any risks associated with the functioning mode.

The proper / correct use of the equipment allows for full exploitation of its characteristics in complete safety. For such purpose:

- follow the instructions in the user manual;
- check the integrity of equipment and components;
- comply with instructions and warnings provided;
- check status of preservation and keep maintenance on the equipment under control;
- check the status of cables and electrical connections;
- comply with the nameplate data such as (but not limited to) power, voltage and amperage;
- use the equipment for the purpose intended by the Manufacturer;
- operate the equipment in the environmental conditions for which it was designed;
- cut off the power supply in case of inspection, repair and maintenance;
- use suitable work clothing and personal protective equipment (PPE);
- immediately report any malfunction (bad behaviour, suspicion of rupture, incorrect movement and noise beyond the standard level) to the department manager and switch off the equipment;
- comply with the recommended maintenance frequency, recording every control and comment related to the performed intervention.

1.3 Misuse / Improper use

The Manufacturer defines as «misuse / improper use» of the equipment any other than what described in the previous paragraph and in addition to that:

- modification of the operating parameters. Should it be necessary to make any modification to the equipment, the Buyer shall contact the Manufacturer;
- use of unsuitable or inadequate energy sources;
- employment of not adequately trained/skilled personnel to run the unit;
- failure to comply with the maintenance instructions or maintenance incorrectly carried out;
- use of non-original spare parts or unsuitable ones;
- modification and / or tapering with the equipment safety devices;
- performance of control operations, maintenance, or repairs without having first disconnected the energy supply;
- performance of temporary repairs or remedial measures not complying with the instructions..

WARNING. The Manufacturer declines all responsibility for damage to persons or belongings due to improper use as defined above.

1.4 Warranty terms

24 months from invoice date for VEGA, ANTARES, ORION, ORION PLUS, GEMINI and AQUARIUS.

36 months from invoice date for SIRIUS.

60 months from invoice date for SIRIUS ADVANCE.

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