

three-phase
100-4000A

OPTI*net*[®]
power quality



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 ±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 arrester - Class II output surge arrester - 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 (Un = 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.



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 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

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, 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, thus guaranteeing **prompt assistance** worldwide.