

History drives the future



**DUCATI** energia



***Actisine Pro***  
**Modular**  
**Active Power Filter**



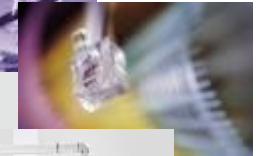
# Key Features

- Modular and easy to extend
- **3 Level Technology**
- **Space-saving high power density design**
- **Hot-scalable power modules**
- **60A/80A per module**
- **Flexible Power Capacity Combination**
- Apply to 3 Phase 3 Wires/4 Wires System
- Advanced DSP technology, programmable
- Close/Open Loop Control
- Compensate up to 51st harmonics
- Power Factor Correction
- Correct unbalance three phase utility
- No problem of overload
- **Advanced Operation Interface— 7" Colorful LCD Touch Screen**



# Application

- **Utilities Industry**
- **Steel, Chemical, Automotive Industry**
- **Semiconductor Factory**
- **Printing, Pulp and Paper Industry**
- **Office, Building and Data Center**
- **Airport**
- **UPS and MCC ( Motor Control Centers )**
- **Medical Center (MRI)**
- **Elevator and HVAC System**
- **Oil Drilling Platform**



# Modular design

## ◆ Control Module

- 208V/400V/440V/480V
- Each controller can manipulate 6 Power Modules.
- 440mm x 630mm x 85mm ( w x d x h )

## ◆ Power Module

- 208V/400V/440V/480V **80A**
- 208V/400V/440V/480V **60A**
- 440mm x 630mm x 176mm ( w x d x h )

## ● Hot-scalable design

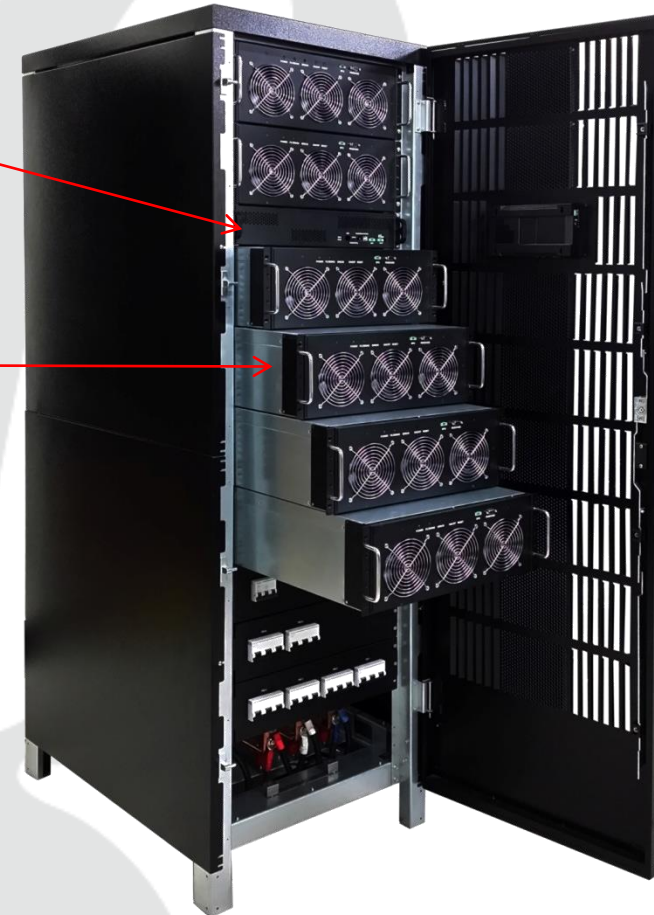
## ● Provides Hot-swappable Rack Rail Kit

## ● Easy to install in standard 19" rack cabinet

Control Module

Power Module

Rack Rail Kit



# Frame

## ◆ Frame 1 :

- 600mm x 900mm x 1950mm ( w x d x h)
- Install up to 6 Power Module, 480A

## ◆ Frame 2:

- 600mm x 900mm x 1500mm ( w x d x h)
- Install up to 4 Power Module, 320A



Control Module

Power Module

CT Terminal

Input Breaker

Input Bus bar

7" LCD Touch Display



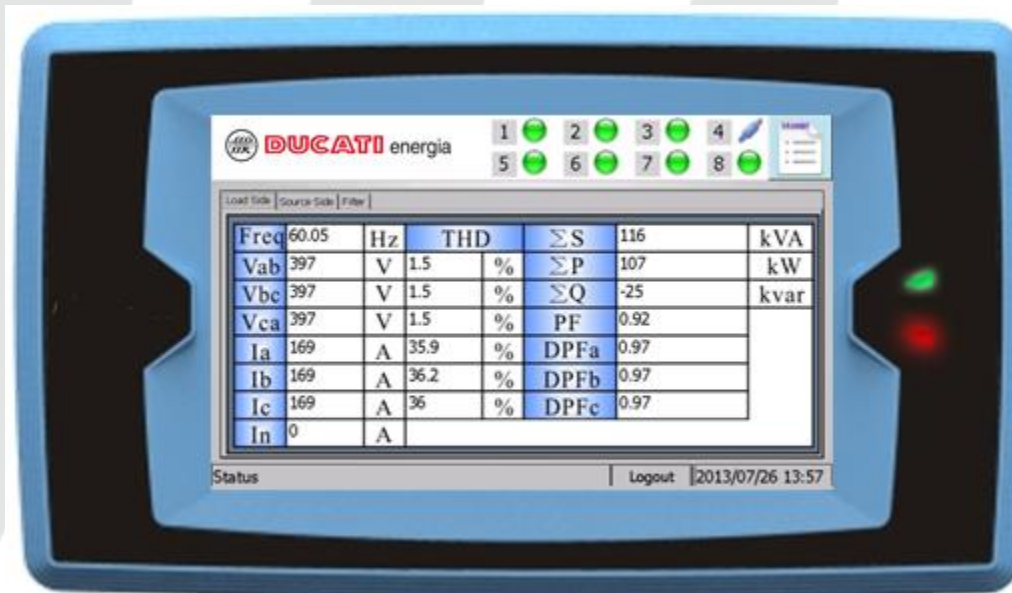
# Key Features

- 7" LCD Touch Screen
- Easy Operation
- Display Voltage/Current waveform, parameter and spectrum
- Multiple Languages
- Come with Ethernet & RS-485 communication ports
- Programmable Output Dry Contact x 3, Input Contact x 1



# Advance operation interface

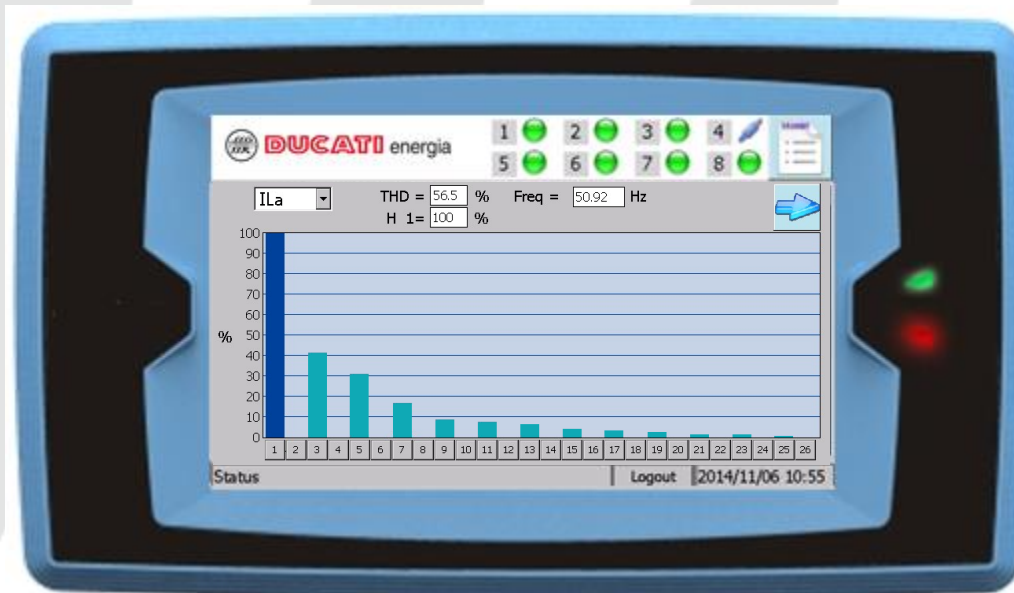
- Power Parameters





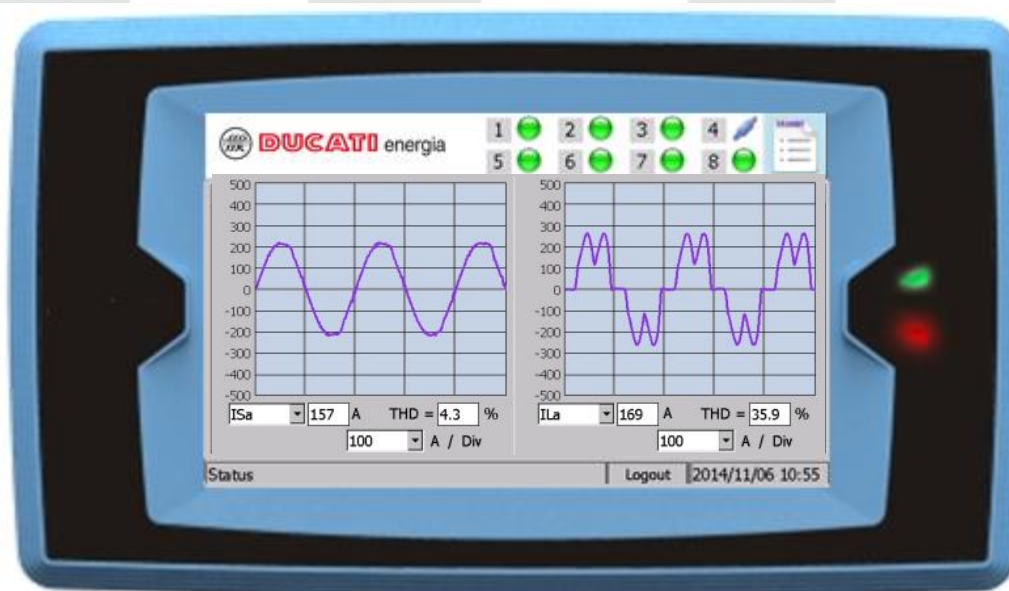
# Advance operation interface

- Harmonic Spectrum



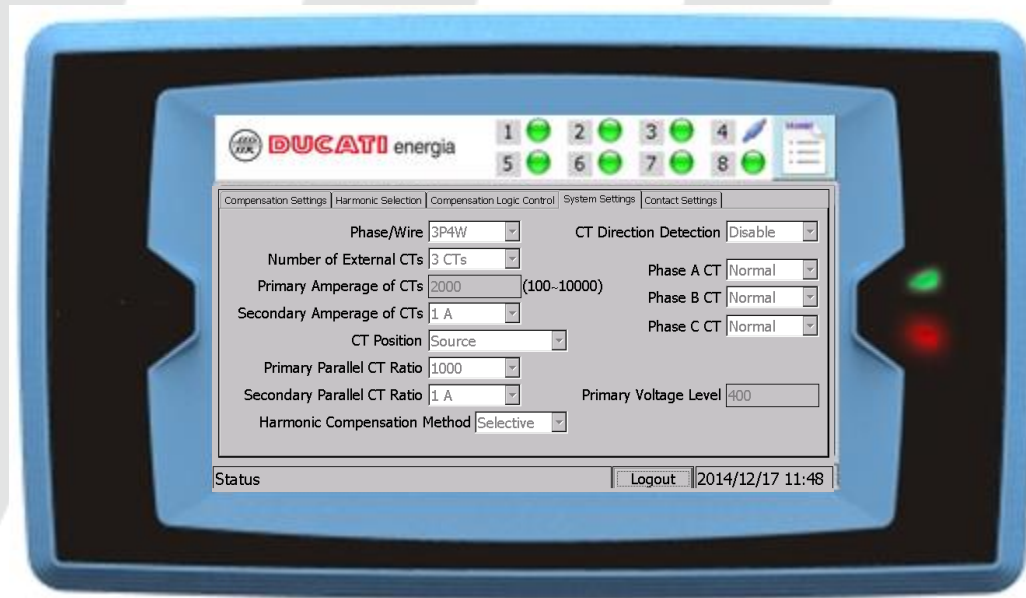
# Advance operation interface

- Waveform



# Advance operation interface

- System Configuration
- Programmable CT Ratio



# Advance operation interface

- Harmonic Enable/Disable
- Power Factory Correction Enable/Disable
- Balance Utility Current Enable/Disable



# Advance operation interface

- Harmonic Order Selection from 2<sup>nd</sup> to 51<sup>st</sup>



# Communication

**Local Service**



RS-232/USB



Ethernet/RS-485



**Remote Monitoring Center**





# Service software

The image displays three overlapping windows from the Enersine Pro Expert Service Program. The top window shows the main configuration page with sections for Compensation Gain, Phase Limit Current(%), Load Rate Percent(%), and Synchronous Gain and Phase. The middle window shows the Compensation Settings, System Settings, and Compensation Logic Control sections. The bottom window shows the Harmonic configuration table.

**Enersine Pro Expert Service Program - Main Configuration**

Phase	Compensation Gain	Phase Limit Current(%)	Load Rate Percent(%)
Phase A	16384	100	100
Phase B	16384	100	100
Phase C	16384	100	100

**Enersine Pro Expert Service Program - Compensation Settings**

Harmonic Compensation: Enable  
Power Factor Correction: Enable  
Compensation Priority: Harmonic  
Reactive Power: Dynamic  
Target DPF (cos  $\phi$ ): 0.95  
Fixed KVAR: 10 %

**Enersine Pro Expert Service Program - System Settings**

Phase / Wire: 3P4W  
Number of External CTs: 3CTs  
Primary Amperage of CTs(100 ~ 10000): 1000  
Secondary Amperage of CTs(1/5): 1  
CT Position: Source  
CT Direction Detection: Enable

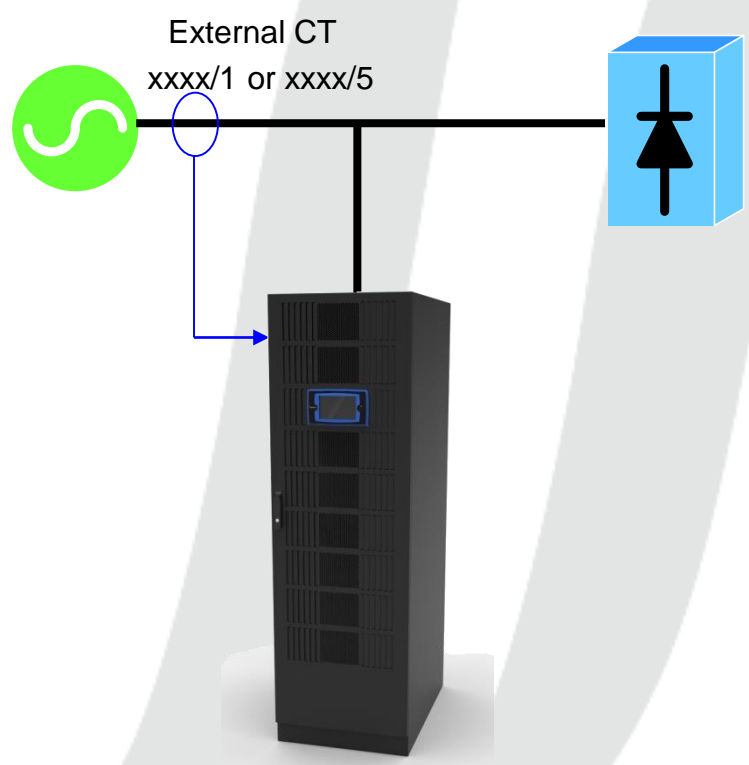
**Enersine Pro Expert Service Program - Compensation Logic Control**

Smart Save Energy: Disable  
ON Delay Time(Seconds): 10  
OFF Delay Time(Seconds): 10  
Max. ON Current Level: 1  
Min. OFF Current Level: 0.5  
Auto Restart: Enable  
Delay Time(Seconds): 5

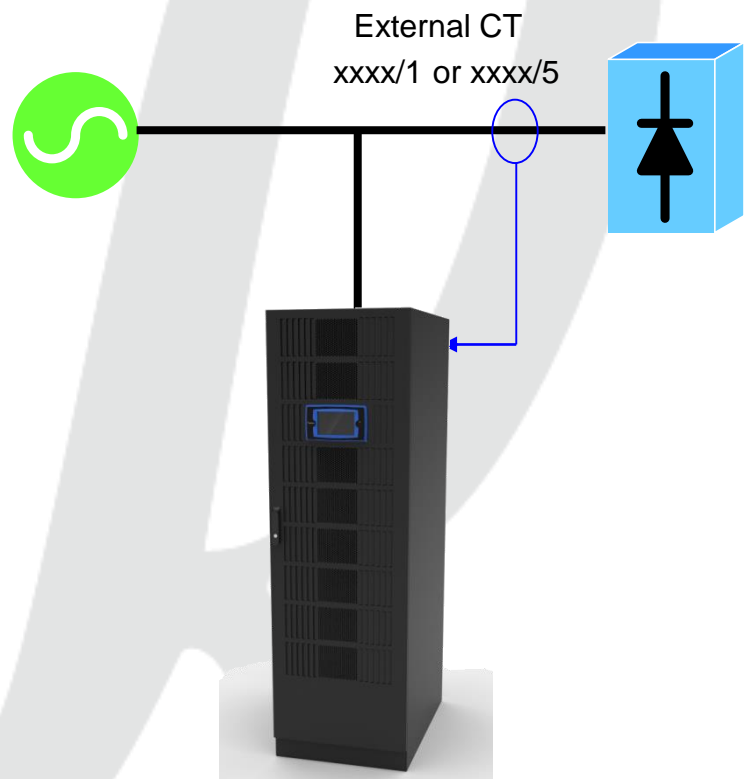
**Enersine Pro Expert Service Program - Harmonic**

Order	Active	Reduction(%)	Order	Active	Reduction(%)	Order	Active	Reduction(%)
2	<input type="checkbox"/>	100%	19	<input type="checkbox"/>	100%	36	<input type="checkbox"/>	100%
3	<input checked="" type="checkbox"/>	100%	20	<input type="checkbox"/>	100%	37	<input type="checkbox"/>	100%
4	<input type="checkbox"/>	100%	21	<input type="checkbox"/>	100%	38	<input type="checkbox"/>	100%
5	<input checked="" type="checkbox"/>	100%	22	<input type="checkbox"/>	100%	39	<input type="checkbox"/>	100%
6	<input type="checkbox"/>	100%	23	<input type="checkbox"/>	100%	40	<input type="checkbox"/>	100%
7	<input checked="" type="checkbox"/>	100%	24	<input type="checkbox"/>	100%	41	<input type="checkbox"/>	100%
8	<input type="checkbox"/>	100%	25	<input type="checkbox"/>	100%	42	<input type="checkbox"/>	100%
9	<input checked="" type="checkbox"/>	100%	26	<input type="checkbox"/>	100%	43	<input type="checkbox"/>	100%
10	<input type="checkbox"/>	100%	27	<input type="checkbox"/>	100%	44	<input type="checkbox"/>	100%
11	<input checked="" type="checkbox"/>	100%	28	<input type="checkbox"/>	100%	45	<input type="checkbox"/>	100%
12	<input type="checkbox"/>	100%	29	<input type="checkbox"/>	100%	46	<input type="checkbox"/>	100%
13	<input checked="" type="checkbox"/>	100%	30	<input type="checkbox"/>	100%	47	<input type="checkbox"/>	100%
14	<input type="checkbox"/>	100%	31	<input type="checkbox"/>	100%	48	<input type="checkbox"/>	100%
15	<input checked="" type="checkbox"/>	100%	32	<input type="checkbox"/>	100%	49	<input type="checkbox"/>	100%
16	<input type="checkbox"/>	100%	33	<input type="checkbox"/>	100%	50	<input type="checkbox"/>	100%
17	<input type="checkbox"/>	100%	34	<input type="checkbox"/>	100%	51	<input type="checkbox"/>	100%
18	<input type="checkbox"/>	100%	35	<input type="checkbox"/>	100%			

# Open/Closed Loop Control



Closed Loop Control

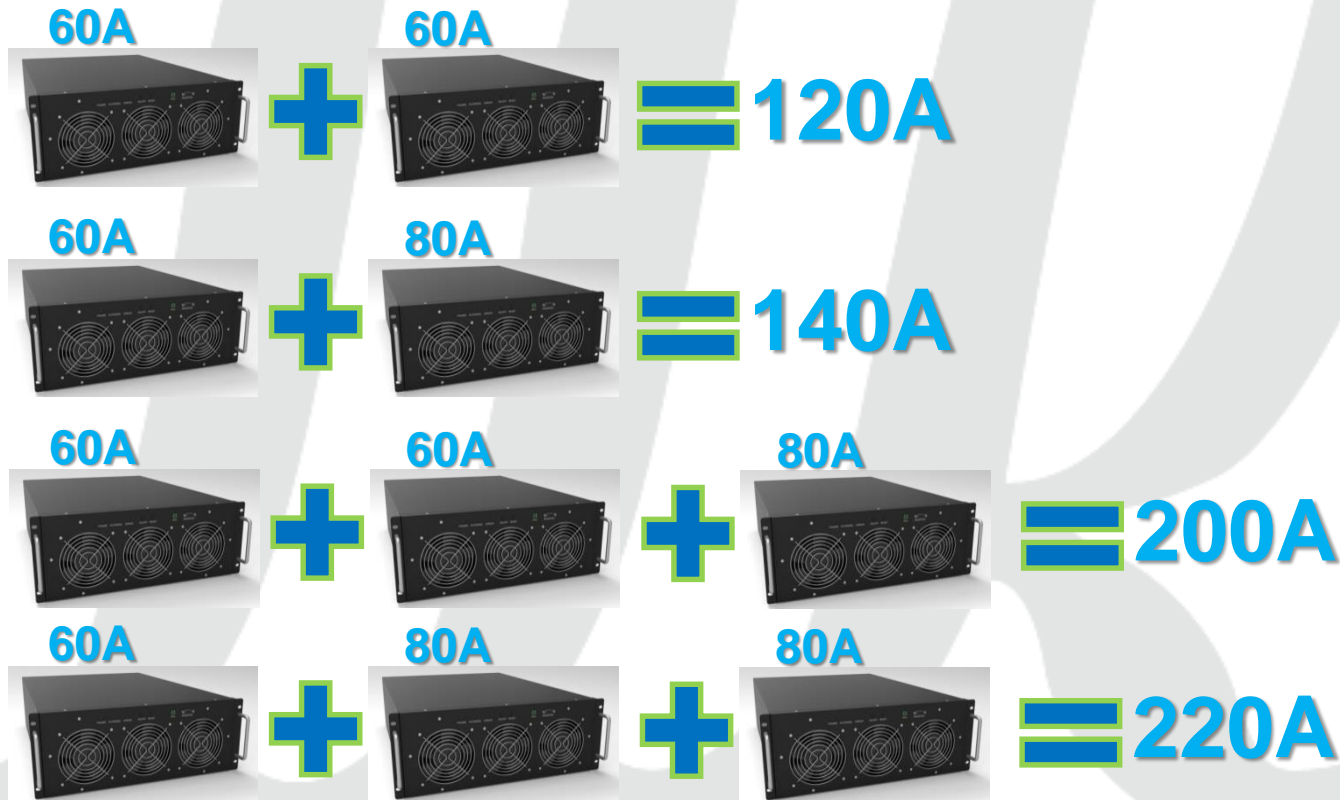


Open Loop Control



# Flexible Extend Power Capacity

- 60A and 80A Power Modules can work together
- Flexible Power Capacity Combination



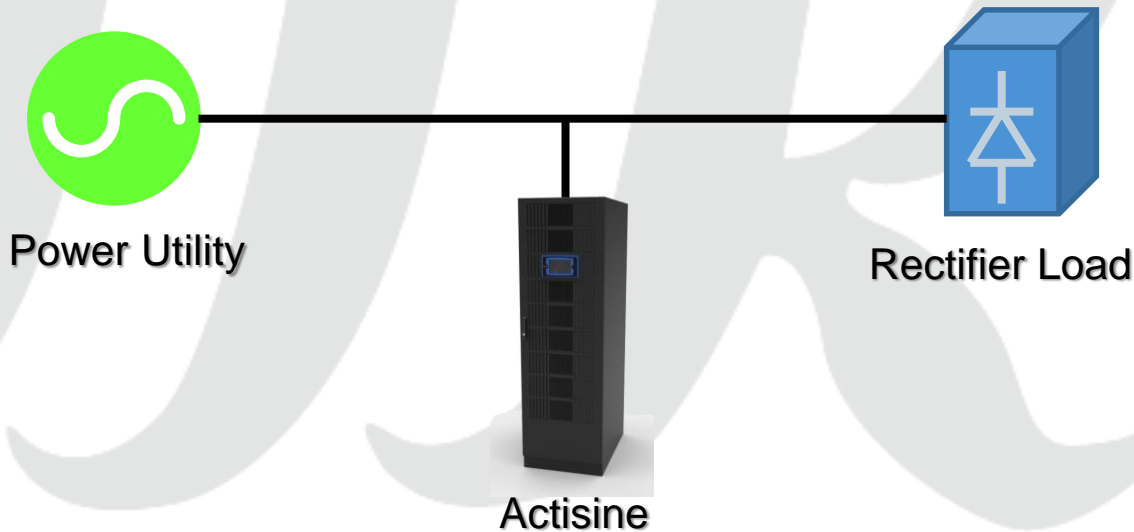
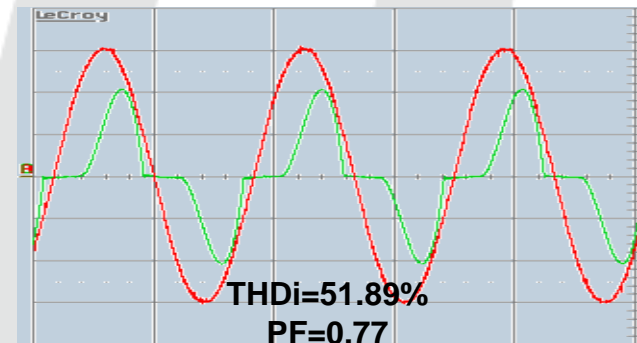
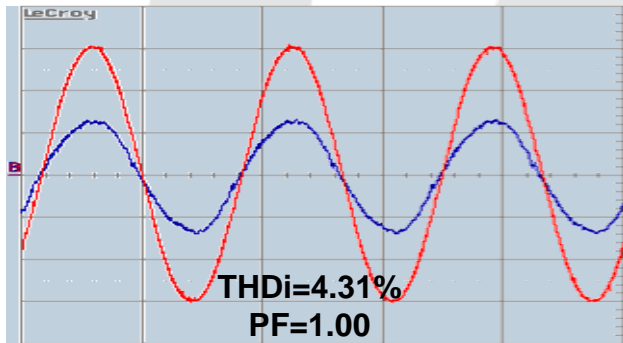
# Parallel

- Up to 24 Power Modules in Parallel
- The maximum capacity up to 1920A
- Only one LCD display is needed



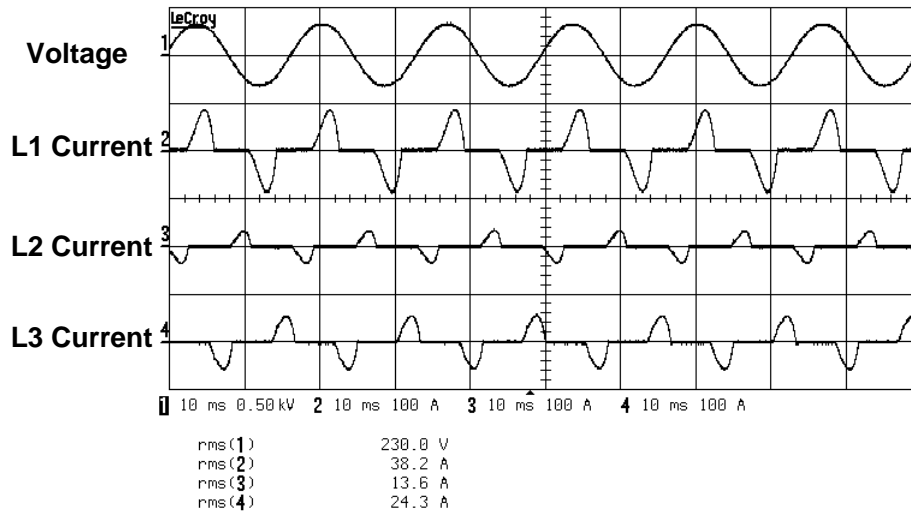
# Harmonic and PF Correction

- **Actisine** not only eliminate harmonic current but also improve power factor.

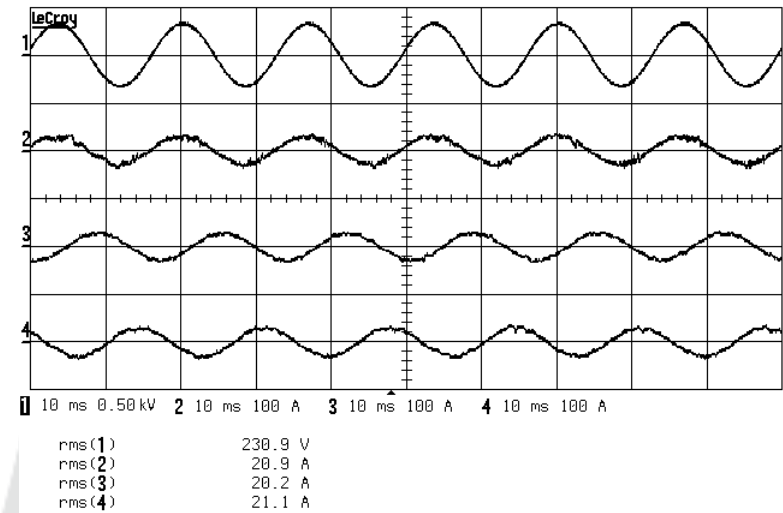


# Balance System Current

Before *Actisine* turn on,  
unbalance three phase current



After *Actisine* turn on,  
three phase current are balanced.





# Specifications

- General

<b>Equipment Storage Temperature</b>	<b>-20 ° C to + 70 ° C</b>
<b>Operating Temperature</b>	<b>+0 ° C to +40 ° C without derating +40 ° C to +50 ° C derating operation</b>
<b>Relative Humidity</b>	<b>&lt;95%</b>
<b>Operating Altitude</b>	<b>&lt;1000 m without derating Up to 3000m</b>
<b>Reference Harmonic Standard</b>	<b>EN61000-3-4, IEEE 519-1992</b>
<b>Reference Design Standard</b>	<b>EN60146</b>
<b>Safety Standard</b>	<b>EN50178</b>
<b>Electromagnetic Compatibility</b>	<b>IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6</b>

# Specifications

## ● Power Module

<b>Input Voltage</b>	208V +15%,-20%	3 phase 4 wires/3wires	
	400V +15%,-20%	3 phase 4 wires/3wires	
	440V +15%,-20%	3 phase 3wires	
	480V +10%,-20%	3 phase 3wires	
<b>Frequency</b>	50/60 ± 3 Hz		
<b>Rating Current of Each Phase</b>	60 Arms	80 Arms	
<b>Rating Current of Neutral</b>	180 Arms	240 Arms	
<b>Inrush Current</b>	Less than rated current		
<b>Current Limitation</b>	Yes, at full correcting		
<b>Maximum Heat losses</b>	208V	700 Watt	920 Watt
	400V~480V	1250 Watt	1650 Watt
<b>Protection Index</b>	IP20		
<b>Dimensions (WxDxH)</b>	440 x 630 x 176mm		
<b>Weight</b>	36 Kg	43 Kg	

# Specifications

## ● Control Module

<b>Input Voltage</b>	<b>208V +15%,-20%    3 phase 4 wires/3wires</b> <b>400V +15%,-20%    3 phase 4 wires/3wires</b> <b>440V +15%,-20%    3 phase 3wires</b> <b>480V +10%,-20%    3 phase 3wires</b>
<b>Frequency</b>	<b>50/60 ± 3 Hz (Auto Sensing)</b>
<b>Compensated Harmonic Orders</b>	<b>From 2<sup>nd</sup> to 51<sup>st</sup> order</b>
<b>Power Factor Correction</b>	<b>Power factor can be programmed from 0.6 lagging to 0.6 leading</b>
<b>Load Balancing</b>	<b>Both phase to phase and phase to neutral</b>
<b>CT Ratio</b>	<b>Primary Current: 100A~10000A    Secondary Current: 1A/5A</b>
<b>CT Location</b>	<b>Source Side: Closed Loop Control                      Load Side: Open Loop Control</b>
<b>Response Time</b>	<b>Global &lt; 1ms    ;    Selective &lt; 10 ms</b>
<b>Number of controllable Power Module</b>	<b>Up to 6 Power Modules.</b>
<b>Parallel</b>	<b>Up to 4 Control Modules.</b>
<b>Maximum Heat losses</b>	<b>50 Watt</b>
<b>Protection Index</b>	<b>IP20</b>
<b>Dimensions (WxDxH)</b>	<b>440 x 630 x 86 mm</b>
<b>Weight</b>	<b>10 Kg</b>

# Specifications

- HMI & Communication

Display	7" LCD Touch Screen
Dry Contact (Standard)	3 Output Dry Contacts 1 Input Dry Contact 1 EPO
Communication	RS485 Modbus RTU, Ethernet Card
Programming	Setting by LCD Panel, Software
Software	<i>ESP-Link Monitoring Software (Option)</i> <i>Actisine Pro Expert Service Program</i>
Communication Protocol	J-Bus / Mod Bus



# Specifications

- Enclosure



<b>Dimensions (WxDxH)</b>	<b>600 x 900 x 1500 mm</b>	<b>600 x 900 x 1950 mm</b>
<b>Max. Power Module</b>	<b>Up to 4 Power Modules. 320A</b>	<b>Up to 6 Power Modules. 480A</b>
<b>Weight (w/o Modules)</b>	<b>150 Kg</b>	<b>195 Kg</b>
<b>Protection Index</b>	<b>IP21</b>	