

**ZCS GREEN INNOVATION
NEW SOLUTIONS FOR
A NEW PERSPECTIVE**



ZUCCHETTI
Centro Sistemi







CONTENTS

ZCS, CONNECTED TO THE FUTURE.	P. 2
MISSION & VISION	2
CORPORATE VALUES & CULTURE	2
FACTS & FIGURES	2
FUTURE & INCREASING DEVELOPMENT	3
GREEN INNOVATION DIVISION: INNOVATION IN THE ENERGY WORLD	3
ZCS AZZURRO: THE SOLUTION FOR A GREEN WORLD.	4
PHOTOVOLTAIC INVERTERS	4
PHOTOVOLTAIC INVERTERS FOR ENERGY STORAGE	5
DISCOVER THE ZCS AZZURRO PRODUCT RANGE.	6
AZZURRO - SINGLE-PHASE STRING INVERTER	7
AZZURRO - THREE-PHASE STRING INVERTER	16
AZZURRO - STORAGE INVERTER	31
BATTERIES FOR STORAGE OR HYBRID SYSTEMS	37
MONITORING SYSTEMS	39
APP AND PORTAL FOR MONITORING THE PV SYSTEMS	40
AZZURRO TECHNICAL ASSISTANCE SERVICE.	41
THE CASA GREEN OF ZCS	43



ZCS, CONNECTED TO THE FUTURE

Zucchetti Centro Sistemi SpA (ZCS) was founded in 1985 as a Software House. The innovative spirit of its founder Fabrizio Bernini, now President of the company, allowed the company to quickly establish itself in the international markets of robotics and automation. In 2000 ZCS became part of Zucchetti S.p.a., the first Italian software company in Europe.

The Company is made up of five Business Units (Software, Automation, Healthcare, Robotics and Green Innovation) that meet the need to diversify and extend the know-how acquired in the design of management software to different and complementary fields, aimed at guaranteeing an excellent and unparalleled service. Today the company stands out for its innovative, high-performing and competitive solutions that integrate the state-of-the-art technologies.

MISSION & VISION

To conceive and develop innovative and high-performance solutions aimed at cross-sector markets requiring excellence, high technology

and a strong competitive advantage. To combine creativity with technological innovation.

CORPORATE VALUES AND CULTURE

Innovation as a culture. The courage to design and create products that do not exist yet, but that could improve and simplify the everyday life of consumers.

In 2005 ZCS founded the “Laboratory of Ideas”, i.e. the R&D department consisting of more than 30 researchers, IT experts, electronic engineers,

GROUP

ZCS is part of the Zucchetti S.p.A. Group, which has over 4,700 employees and more than 350,000 customers

ZCS FACTS AND FIGURES

- Turnover of € 78 million (2018)
- 250 employees
- more than 100 patents
(for 50 inventions)
- 17 innovation awards
- 5 core businesses
- 9,000 active users



mechanics and designers, who combine their creativity and know-how to develop the most innovative solutions for the various Business Units in the field of IoT (Internet of Things), Machine Learning and Artificial Intelligence. Human capital is the winning force of ZCS, driven by the sharing of corporate values: creativity, enthusiasm, passion, job responsibility, ethics and respect.

FUTURE & INCREASING DEVELOPMENT

An innovative future-oriented company that is aware of its origins and territory, and that continues to grow focusing on technology, environmental sustainability and energy savings.

GREEN INNOVATION DIVISION: INNOVATION IN THE ENERGY WORLD

Always sensitive to environmental and energy-saving issues, in 2016 ZCS created a Business Unit dedicated to renewable energy and the most innovative solutions, conceived from the integration of ideas and technologies aimed at improving quality of life, operational efficiency and energy savings for people and companies. The Green Innovation Division presented itself to the main market players with ZCS Azzurro, immediately winning the trust of the international market. Azzurro is the latest generation inverter that combines ZCS "IT" and "smart" intelligence with the most advanced electronic technologies to create a new concept of photovoltaic inverters. This range was joined by energy storage systems and energy saving solutions.

ZCS AZZURRO: THE SMART SOLUTION FOR A GREEN WORLD.



Industrial



PHOTOVOLTAIC INVERTERS

Single-phase, Three-phase and Storage

In the age of the Internet of Things, our goal is to offer a technically advanced, reliable and high-performing product with the added advantage of making the photovoltaic system part of a Smart Home, aimed at improving the quality of life, operational efficiency and energy savings of those who choose ZCS technology.

Azzurro is the latest generation inverter that combines and integrates ZCS "IT" and "smart" intelligence with the most advanced electronic technology to create a new concept of photovoltaic inverters. Azzurro focuses on maximising efficiency and optimising yield, but also and above all on enhancing connectivity.

FOR ALL SIZES

The wide range of ZCS Azzurro products meets all energy requirements for residential, commercial and industrial applications. More

than 50 models are available, ranging in sizes from 1 to 6 Kw single-phase and from 3.3 to 70 Kw three-phase, in addition to a wide range of equipment and accessories. The offer is completed by energy storage solutions (AC or hybrid) up to 30 kWh, simple and flexible, dedicated to new constructions or retrofit systems.

The die-cast aluminium and IP65 protection rating make ZCS Azzurro a robust and high-quality product, backed by a 10-year warranty. The extremely simple installation and configuration, combined with the efficiency of the support team have been designed to improve the customer's quality of life.

RELIABLE

High quality components,
long service life



USER-FRIENDLY

Thanks to the multifunction
graphic display



SIMPLE

Fast assembly and installation





Commercial



Residential

SMART & INNOVATIVE

ZCS Azzurro not only allows checking and monitoring the energy produced in a day, but also to autonomously decide when and which household appliances to activate and deactivate, simply by using a mobile network or Internet connection, anywhere and anytime.

The wide range of ZCS products is completed with Lithium Iron-Phosphate or Lithium-Ion batteries, tested and fully compatible with the functions of the Azzurro inverters.

PHOTOVOLTAIC INVERTER FOR ENERGY STORAGE

IDEAL FOR RETROFITTING



**NO CHANGES TO THE
EXISTING SYSTEM**



EXCELLENT PERFORMANCE



EASY TO INSTALL



ZCS Azzurro Storage maximises autonomy and its extreme flexibility makes it suitable for both new constructions and retrofit projects: ideal for homes, private residences and small businesses. Quick and easy installation, and automatic configuration. With nominal power of 3 Kw and storage capacity of up to 30 kWh, it can also operate in stand-alone mode, guaranteeing continuous energy supply during a black-out.

DISCOVER THE
ZCS AZZURRO
PRODUCT RANGE



AZZURRO - SINGLE-PHASE STRING INVERTER

1100TL/1600TL/2200TL
2700TL/3000TL



The TL series **ZCS Azzurro Single-Phase** inverters are the ideal solution for small photovoltaic systems in residential buildings. Available in sizes from 1 to 3kw, they are small, easy to manage and easy to install.

The wide range of input makes them easy to configure and suitable for any type of need, for both new installations or retrofit on existing ones.

The multifunction graphic display provides instant viewing of all the data and the Wi-Fi connectivity allows remote monitoring at no cost.



ZCS AZZURRO TECHNOLOGY

- Performance optimisation
- Wi-Fi integration on ZCS platform for stable, effective and intelligent connectivity



MAXIMUM ENERGY EFFICIENCY

- Maximum performance 97.2%
- Stable efficiency in all working conditions
- Rapid and accurate MPPT algorithm



FLEXIBLE, ECONOMICAL AND EASY-TO-INSTALL SOLUTION

- Protection rating of IP65
- Fast and safe installation with all required parts included
- "Plug & Play" AC and DC connections
 - Wireless communication with integrated Web Server
 - 4-inch LCD graphic display
 - ENEL Autotest in standard or fast versions
- Updates and diagnostics via SD card



RELIABILITY, DURABILITY AND FLEXIBILITY

- Rust-proof, corrosion-proof and UV-proof aluminium exterior casing
 - Natural ventilation cooling
- Fast and flexible management of function parameters
- Simple and user-friendly monitoring
 - 10 year ZCS warranty



INTELLIGENT GRID MANAGEMENT

- Dynamic management of grid feed-in
 - "Zero Grid Feed-in" functionality *
 - Remote control of the deliverable active/reactive power limit



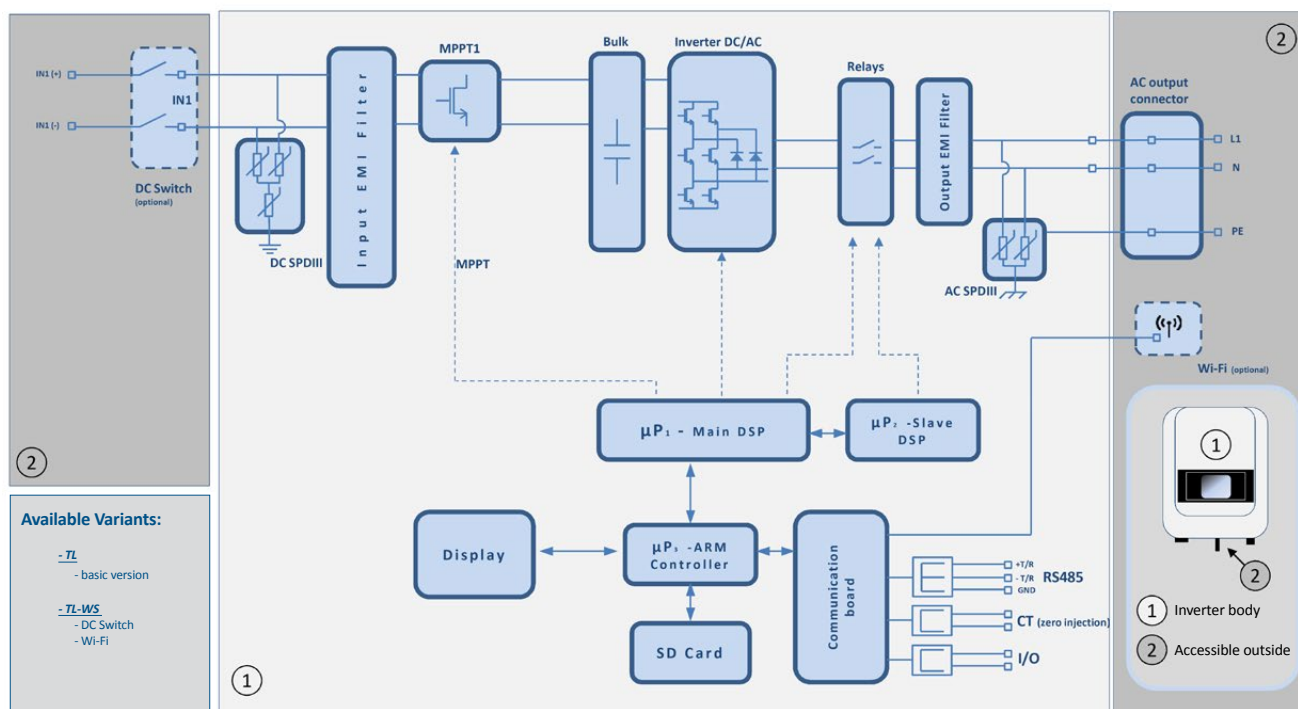
IDEAL FOR RETROFITTING

- Wide input operating range from 90V to 550V
 - Compact size
- Simple and user-friendly installation and configuration

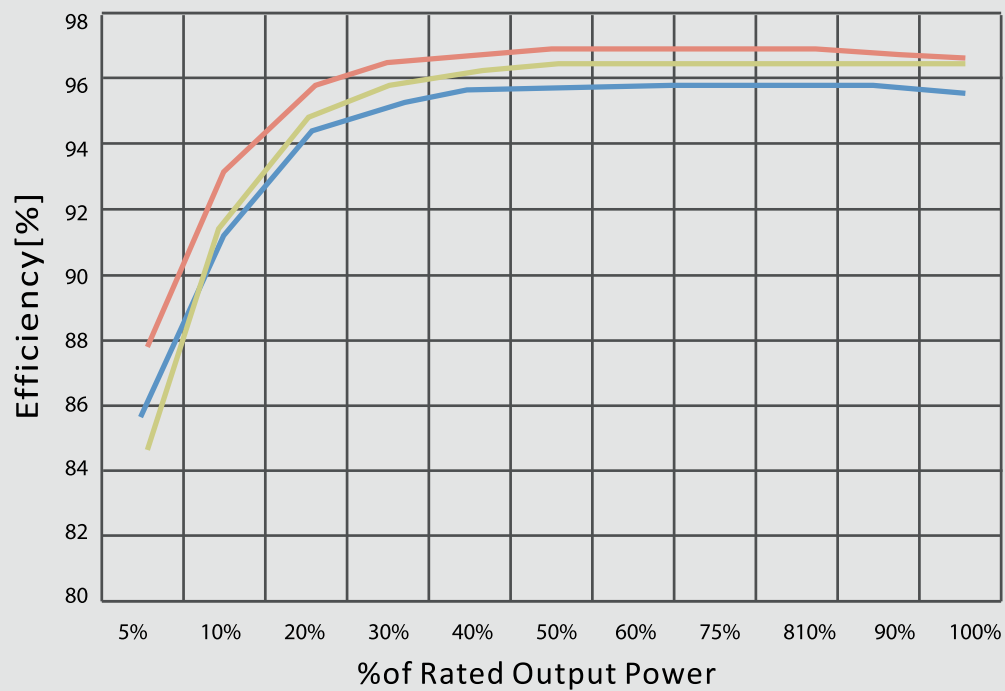


*Possible through a current sensor (ZST-ACC-TA)

FLOW CHART



EFFICIENCY CURVE



TECHNICAL DATA	1100TL	1600TL	2200TL	2700TL	3000TL
DC Input data					
Typical DC power	1200W	1800W	2400W	2900W	3300W
No. of independent MPPTs/No. of strings per MPPT	1/1				
Maximum DC input voltage	450V		500V		
Activation voltage	100V		120V		
Nominal DC input voltage	360V				
MPPT range of DC voltage	80-450V		100-500V		
DC voltage range at full load	110-450V	165-450V	170-500V	200-500V	
Maximum input current for each MPPT	10A		13A	13.5A	15A
AC output data					
Nominal AC power	1000W	1550W	2100W	2600W	3100W
Maximum AC power	1000VA	1550VA	2100VA	2600VA	3100VA
Maximum AC Current	4.5A	7A	9.5A	11.5A	13A
Type of connection/nominal grid voltage	Single-phase L/N/PE / 220V,230V,240V				
Grid Voltage range	180~270V (according to the local grid standards)				
Grid nominal frequency	50/60Hz				
Grid frequency range	45~53 / 57~63 Hz (according to the local grid standards)				
Total current harmonic distortion	<3%				
Power factor	1 (programmable +/-0.8)				
Active Power adjustable range	0~100%				
Grid feed-in limitation	Feed in adjustable from zero to the nominal power value*				
Efficiency					
Maximum efficiency	97%		97.1%		97.2%
Weighted efficiency (EURO)	95.2%	95.9%	96.1%	96.4%	96.5%
MPPT efficiency	>99.9%				
Night-time consumption	<1W				
Protections					
Safety protections	Anti islanding, RCMU, Ground Fault Monitoring				
DC reverse polarity protection	Yes				
DC switch	Optional (only WS models)				
Surge protection	Yes				
Protection class/Surge category	I/III				
Integrated dischargers	AC/DC MOV: Type III standard				
Standard					
EMC	EN 61000-6-1/2/3/4,				
Safety standard	IEC 62116, IEC 61727, IEC 61683, IEC 60068-1/2/14/30, IEC 62109-1/2				
Grid connection standard	AS 4777, VDE V 0124-100, VDE V 0126-1-1, VDE-AR-N 4105, EN50438, G83/2, C10/11, RD1699, CEI 0-21				
Communication					
Communication interfaces	Wi-Fi (only WS models), RS485 (proprietary protocol), SD card				
Additional inputs or connections	Input for current sensor connection				
Data storage on SD	25 years				
General information					
Permissible ambient temperature range	-25°C...+60°C (power limitation above 45°C)				
Topology	Transformerless				
Environmental protection rating	IP65				
Permissible relative humidity range	0%.....95% senza condensazione				
Maximum operating altitude	2000m				
Noise	< 25dB @ 1mt				
Weight	11kg		12kg		
Cooling	Natural ventilation				
Dimensions (H*L*D)	405mm*314mm*135mm				
Display	LCD				
Warranty	10 years				

*Possible by connecting a current sensor (ZST-ACC-TA)



AS4777 G83/2 G59/3

CE, CEI 0-21, CQC, IEC, VDE-AR-N4105/VDE-0126, EMC, C10/11, EN50438, RD1669

AZZURRO - SINGLE-PHASE STRING INVERTER

3000TLM/3680TLM/4000TLM/4600TLM
5000TLM/6000TLM



The TLM series **ZCS Azzurro Single-Phase** inverters are the ideal solution for photovoltaic systems in residential or commercial buildings. Available in sizes from 3 to 6kw, they are small, easy to manage, easy to install and are all equipped with dual MPPT channel.

The wide range of input makes them easy to configure and suitable for any type of need, for both new installations or for retrofitting on existing systems.

The multifunction graphic display provides immediate viewing of all the data and the Wi-Fi connectivity allows remote monitoring at no cost.



ZCS AZZURRO TECHNOLOGY

- Performance optimisation
- Wi-Fi integration on ZCS platform for stable, effective and intelligent connectivity



MAXIMUM ENERGY EFFICIENCY

- Maximum performance 97.6%
- Stable efficiency in all working conditions
- Rapid and accurate MPPT algorithm
- Dual input section with independent MPPTs



FLEXIBLE, ECONOMICAL AND EASY-TO-INSTALL SOLUTION

- Protection rating of IP65
- "Plug & Play" AC and DC connections
- Wireless communication with integrated Web Server
- 4-inch LCD graphic display
- ENEL Autotest in standard or fast versions
- Updates and diagnostics via SD card



RELIABILITY, DURABILITY AND FLEXIBILITY

- Rust-proof, corrosion-proof and UV-proof aluminium exterior casing
- Natural ventilation cooling
- Fast and flexible management of operating parameters
- Simple and user-friendly monitoring
- 10 year ZCS warranty



INTELLIGENT GRID MANAGEMENT

- Dynamic management of grid feed-in
 - "Zero Grid Feed-in" functionality*
 - Remote control of the deliverable active/reactive power limit



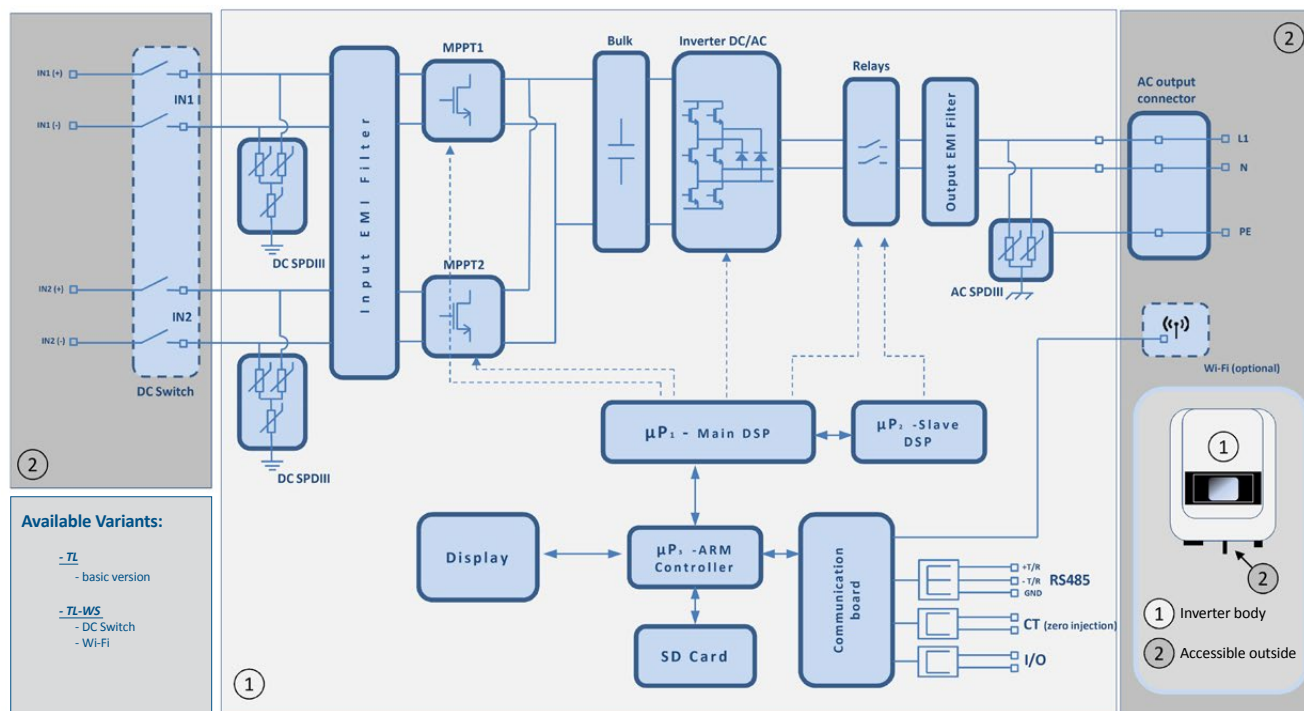
IDEAL FOR RETROFITTING

- Wide input operating range from 100V to 550V
- Compact size
- Simple and user-friendly installation and configuration
- Dual MPPT channel

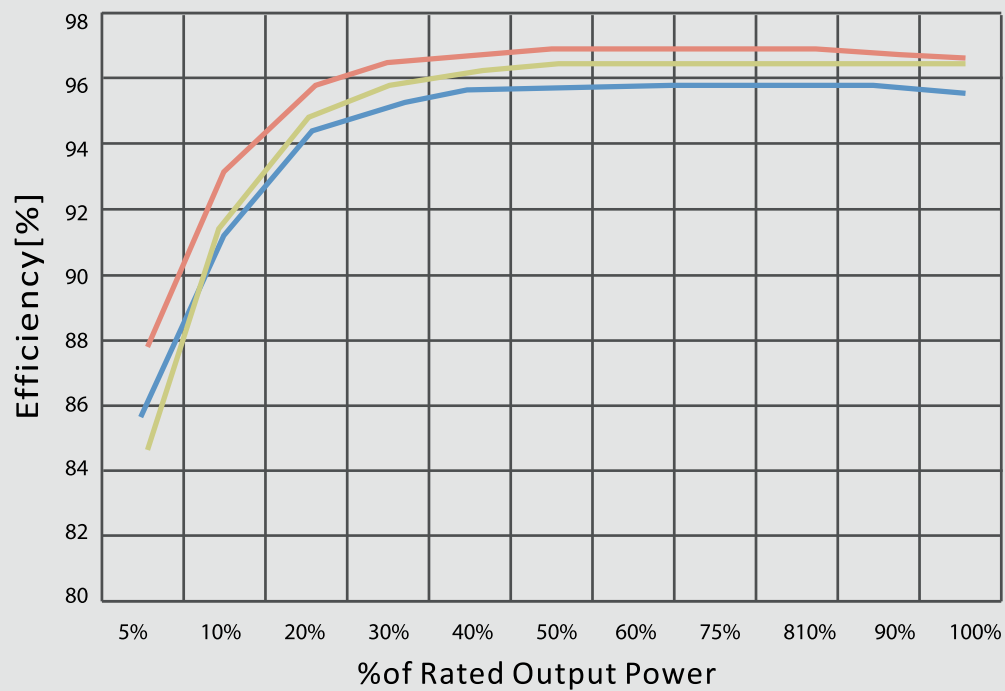


*Possible with the use of a current sensor (ZST-ACC-TA)

FLOW CHART



EFFICIENCY CURVE



TECHNICAL DATA	3000TLM	3680TLM	4000TLM	4600TLM	5000TLM	6000TLM
DC input data						
Typical DC power	3300W	4000W	4400W	5000W	5500W	6600W
Maximum DC power for each MPPT	2000W (200V-500V)	2400W (200V-500V)	2600W (200V-500V)	3000W (200V-500V)		3150W (250V-520V)
No.ofindependentMPPTs/No.ofstringsperMPPT	2/1					
Maximum DC input voltage	600V					
Activation voltage	100V	120V				
Nominal DC input voltage	360V					
MPPT range of DC voltage	80V-580V	100V-580V				
DC voltage range at full load	160V-520V	165V-520V			175V-520V	250V-520V
Maximum input current for each MPPT	10A/10A	12A/12A	13A/13A	15A/15A		
AC output data						
Nominal AC power	3000W	3680W	4000W	4600W	5000W	6000W
Maximum AC power	3000VA	3680VA	4000VA	4600VA	5000VA	6000VA
Maximum AC current	13A	16A	17.5A	20A	22A	26A
Connection type/Grid nominal voltage	Single-phase L/N/PE / 220V,230V,240V					
Grid voltage range	180V~270V (according to the local grid standards)					
Grid nominal frequency	50Hz/60Hz					
Grid frequency range	45Hz~53Hz / 57Hz~63Hz (according to the local grid standards)					
Total harmonic distortion	<3%					
Power factor	1 (programmable +/-0.8)					
Active power adjustment range	0~100%					
Grid feed-in limitation	Feed-in adjustable from zero to the nominal power value*					
Efficiency						
Maximum efficiency	97.6%					
Weighted efficiency (EURO)	97.1%/97.3%					
MPPT efficiency	>99.9%					
Night-time consumption	<1W					
Protections						
Safety protections	Anti islanding, RCMU, Ground Fault Monitoring					
DC reverse polarity protection	Yes					
DC switch	Optional (only WS models)					
Surge protection	Yes					
Protection class/Surge category	I/III					
Integrated dischargers	AC/DC MOV: Type III standard					
Standard						
EMC	EN 61000-6-1/2/3/4,					
Safety standard	IEC 62116, IEC 61727, IEC 61683, IEC 60068-1/2/14/30, IEC 62109-1/2					
Grid connection standard	AS 4777, AS 3100, VDE-AR-N 4105, EN50438, G83/G59, C10/11, CEI 0-21					
Communication						
Communication interfaces	Wi-Fi (only WS models), RS485 (proprietary protocol), SD card					
Additional inputs or connections	Input for current sensor connection					
Data storage on SD	25 years					
General information						
Permissible ambient temperature range	-25°C...+60°C (power limitation above 45°C)					
Topology	Transformerless					
Environmental protection rating	IP65					
Permissible relative humidity range	0%.....95% without condensation					
Maximum operating altitude	2000m					
Noise	< 25dB @ 1mt					
Weight	18Kg			19Kg		
Cooling	Natural ventilation					
Dimensions (H*L*D)	478mm*344mm*170mm					
Display	LCD					
Warranty	10 years					

* Possible by connecting a current sensor (ZST-ACC-TA)

AZZURRO - SINGLE-PHASE STRING INVERTER

3KTLM-L/3.6KTLM-L/4KTLM-L
4.6KTLM-L/5KTLM-L/6KTLM-L

The **LITE** series **ZCS Azzurro Single-Phase** inverters are the ideal solution for photovoltaic systems in residential or commercial buildings. Available in sizes from 3 to 6kw, they are very compact, easy to handle, easy to install and come with double MPPT channel for maximum energy efficiency.

The wide range of input makes them easy to configure and suitable for any type of need, for both new installations or for retrofitting on existing systems. The alphanumeric display provides immediate viewing of all the data and the Wi-Fi connectivity allows remote monitoring at no cost.



ZCS AZZURRO TECHNOLOGY

- Performance optimisation
- Wi-Fi integration on ZCS platform for stable, effective and intelligent connectivity



MAXIMUM ENERGY EFFICIENCY

- Maximum performance 98%
- Stable efficiency in all working conditions
- Rapid and accurate MPPT algorithm
- Dual input section with independent MPPTs



FLEXIBLE, ECONOMICAL AND EASY-TO-INSTALL SOLUTION

- Protection rating of IP65
- "Plug & Play" AC and DC connections
- Wireless communication with integrated Web Server
- Alphanumeric display
- ENEL Autotest in standard or fast versions
- Updates and diagnostics via SD card



RELIABILITY, DURABILITY AND FLEXIBILITY

- Rust-proof, corrosion-proof and UV-proof aluminium exterior casing
- Natural ventilation cooling
- Fast and flexible management of operating parameters
- Simple and user-friendly monitoring
- 5 year ZCS warranty



INTELLIGENT GRID MANAGEMENT

- Dynamic management of grid feed-in
- "Zero Grid Feed-in" functionality*
- Remote control of the deliverable active/reactive power limit



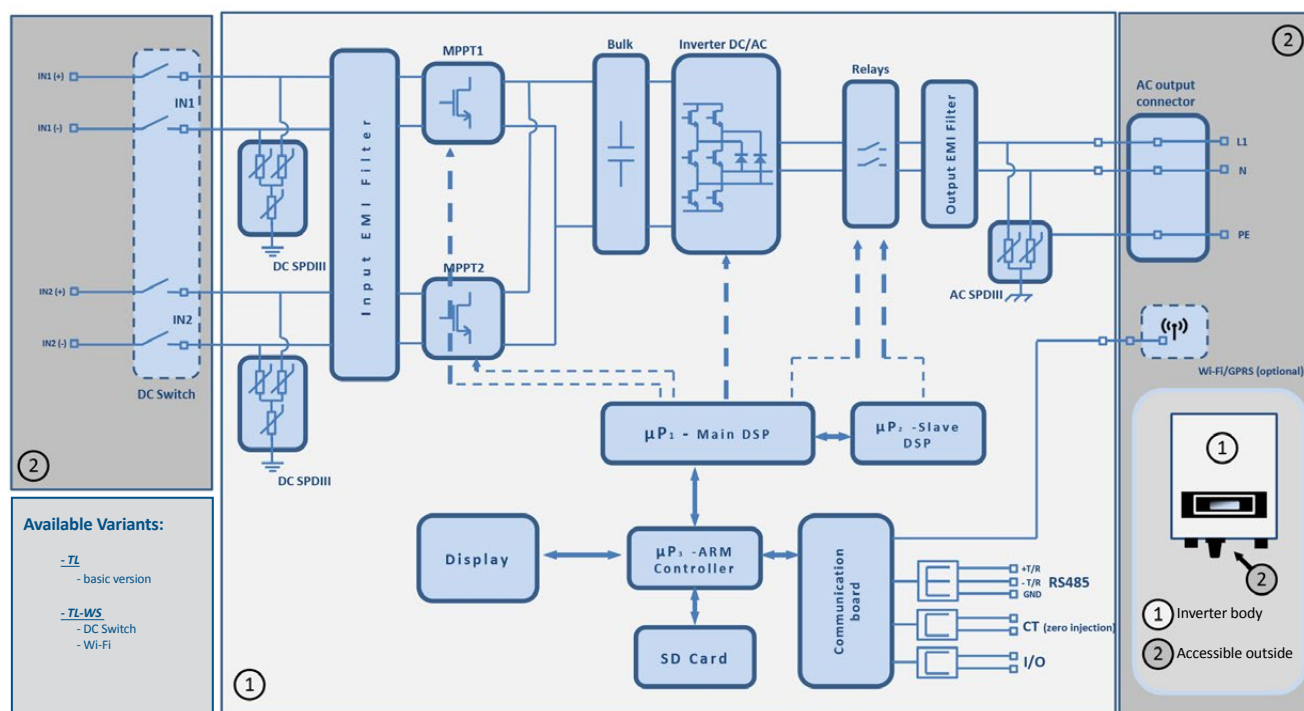
IDEAL FOR RETROFITTING

- Wide input operating range from 160V to 520V
- Compact size
- Simple and user-friendly installation and configuration
- Dual MPPT channel

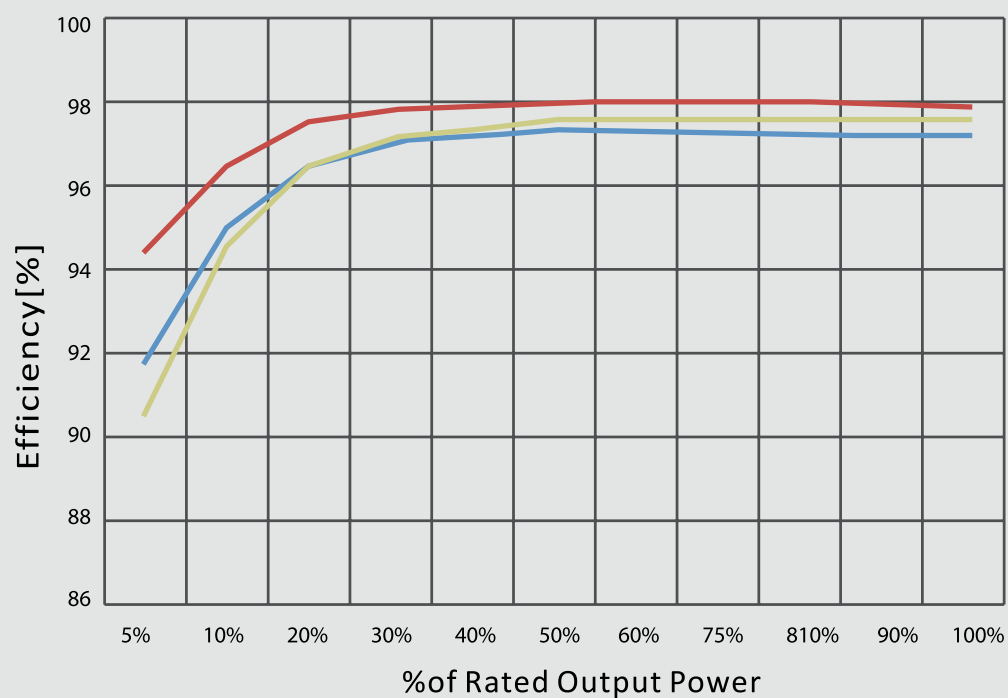


*Possible with the use of a current sensor (ZST-ACC-TA)

FLOW CHART



EFFICIENCY CURVE



TECHNICAL DATA	3KTLM-L	3.6KTLM-L	4KTLM-L	4.6KTLM-L	5KTLM-L	6KTLM-L
DC input data						
Typical DC power	3500W	4000W	4400W	5000W	5500W	6600W
Maximum DC power for each MPPT	2000W (160V-520V)	2400W (180V-520V)	2600W (200V-520V)	3000W (250V-520V)		3500W (300V-520V)
No.of independent MPPTs/No.of strings per MPPT	2/1					
Maximum DC input voltage	600V					
Activation voltage	120V					
Nominal DC input voltage	360V					
DC voltage MPPT range	90V-580V					
DC voltage range at full load	160V-520V	180V-520V	200V-520V	230V-520V	250V-520V	300V-520V
Maximum input current for each MPPT	11A/11A					
AC output data						
Nominal AC power	3000W	3680W	4000W	4600W	5000W	6000W
Maximum AC power	3000VA	3680VA	4000VA	4600VA	5000VA	6000VA
Maximum AC current	13.7A	16.8A	18.2A	21A	22.8A	27.3A
Type of connection/nominal grid voltage	Single-phase L/N/PE / 220V,230V,240V					
Grid voltage range	180V~270V (according to the local grid standards)					
Grid nominal frequency	50Hz/60Hz					
Grid frequency range	45Hz~53Hz / 57Hz~63Hz (according to the local grid standards)					
Total harmonic distortion	<3%					
Power factor	1 (programmable +/-0.8)					
Active power adjustment range	0~100%					
Grid feed-in limitation	Feed-in adjustable from zero to the nominal power value*					
Efficiency						
Maximum efficiency	98%					
Weighted efficiency (EURO)	97.5%					
MPPT efficiency	>99.9%					
Nigh-time consumption	<1W					
Protection						
Safety protections	Anti islanding, RCMU, Ground Fault Monitoring					
DC reverse polarity protection	Yes					
DC switch	Optional (only WS models)					
Surge protection	Yes					
Protection class/Surge category	I/III					
Integrated dischargers	AC/DC MOV: Type III standard					
Standard						
EMC	EN 61000-6-1/2/3/4,					
Safety standard	IEC 62116, IEC 61727, IEC 61683, IEC 60068-1/2/14/30, IEC 62109-1/2					
Grid connection standard	NB/T32004-2013, AS 4777, VDE 0126-1-1, VDE-AR-N 4105, EN50438, G83/2, G59/3, C10/11, CEI 0-21, RD1699/UTEC15-712-1					
Communication						
Communication interface	Wi-Fi (only models -WS), RS485 (proprietary protocol), SD card					
Additional inputs or connections	Input for current sensor connection					
Data storage on SD	25 years					
General information						
Permissible ambient temperature range	-25°C...+60°C (power limitation above 45°C)					
Topology	Transformerless					
Environmental protection rating	IP65					
Permissible relative humidity range	0%.....95% without condensation					
Maximum operating altitude	2000m					
Noise	< 25dB @ 1mt					
Weight	11.5Kg					
Cooling	Natural ventilation					
Dimensions (H*L*D)	405mm*315mm*135mm					
Display	LCD					
Warranty	5 years					

*Possible by connecting current sensor (ZST-ACC-TA)

AZZURRO - THREE-PHASE STRING INVERTER

3.3KTL/4.4KTL/5.5KTL/6.6KTL
8.8KTL/11KTL/12KTL



The compact **ZCS Azzurro three-phase** inverters are the ideal solution for small and medium sized PV systems for commercial or residential applications and small industries.

The Italian technology developed by ZCS makes the Azzurro series efficient, versatile and highly functional.

The wide input range makes the products easy to configure and suitable for any type of requirement, in new installations or retrofit projects.



ZCS AZZURRO TECHNOLOGY

- Performance optimisation
- Wi-Fi integration on ZCS platform for stable, effective and intelligent connectivity

MAXIMUM ENERGY EFFICIENCY

- Maximum performance 98.3%
- Stable efficiency in all working conditions
- Rapid and accurate MPPT algorithm
- Dual input section with independent MPPTs

FLEXIBLE, ECONOMICAL AND EASY-TO-INSTALL SOLUTION

- Protection rating of IP65
- Integrated string combiner with different configuration options
- Power Management Unit
- 4-inch LCD graphic display
- Updates and diagnostics via SD card

RELIABILITY, DURABILITY AND FLEXIBILITY

- Rust-proof, corrosion-proof and UV-proof aluminium exterior casing
- Natural ventilation cooling
- Flexible and user-friendly management of operating parameters
- Topology without transformer
- 10 year ZCS warranty

INTELLIGENT GRID MANAGEMENT

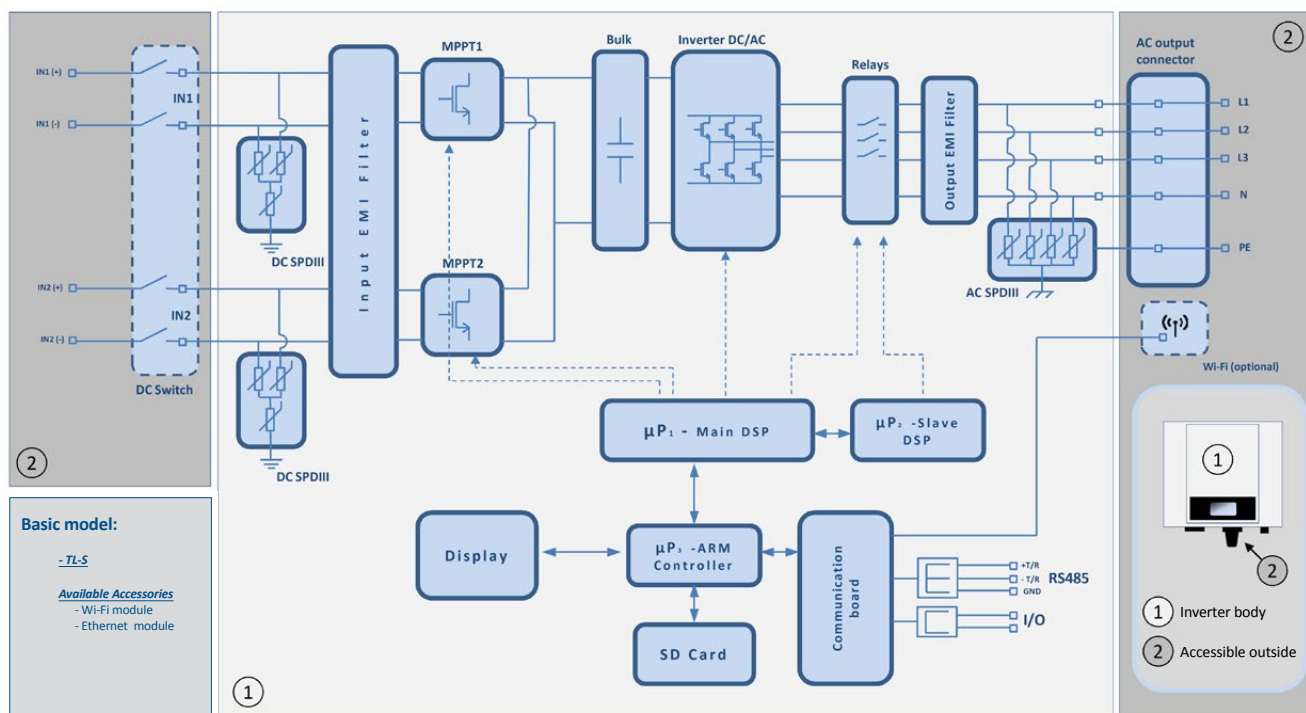
- Dynamic management of grid feed-in
- "Zero Grid Feed-in" functionality*
- Possibility to manage reactive power
- Remote control of the deliverable active/reactive power limit

IDEAL FOR RETROFITTING

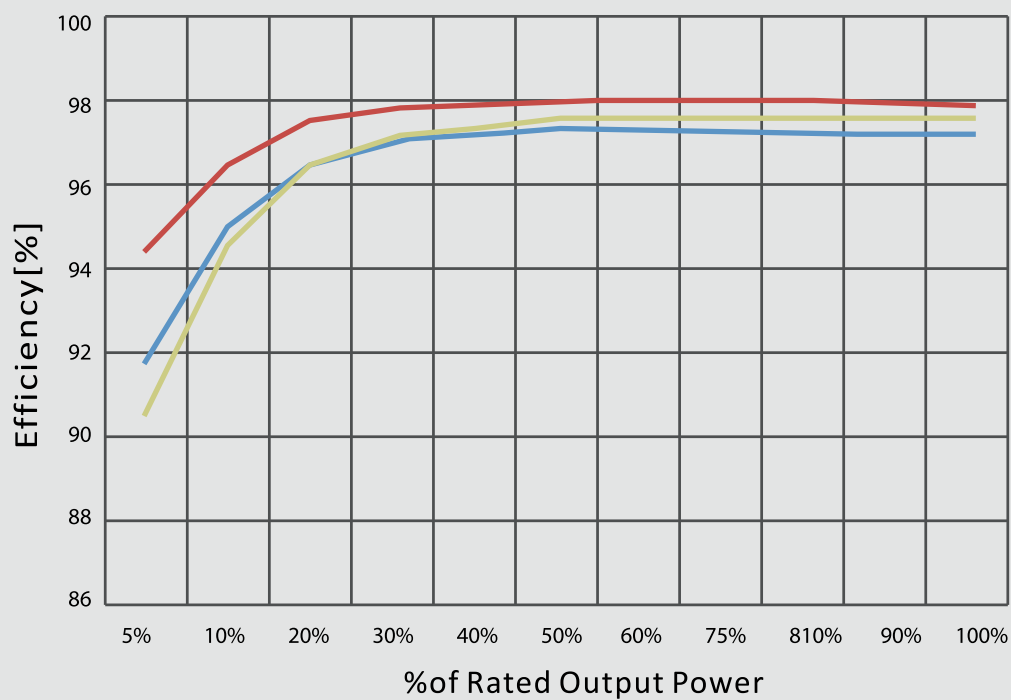
- Wide operating input range from 160V to 960V also suitable for small string systems
- Compact size
- Simple and user-friendly installation and configuration
- Dual MPPT channel

*Possible through current sensor (ZST-ACC-TA) and anti-reverse power controller (ZSM-ZEROINJ)

FLOW CHART



EFFICIENCY CURVE



TECHNICAL DATA	3.3KTL	4.4KTL	5.5KTL	6.6KTL	8.8KTL	11KTL	12KTL
DC input data							
Typical DC power	3600W	4800W	6000W	7200W	9600W	12000W	14400W
Maximum DC power per MPPT	3600W(300V-850V)	4800W(440V-850V)	6000W(545V-850V)	7200W(660V-850V)	8800W(800V-850V)	8800W(800V-850V)	8800W(800V-850V)
No of independent MPPTs/No. of strings per MPPT	2/1						
Maximum DC input voltage	1000V						
Activation voltage	180V						
Nominal DC input voltage	600V						
MPPT range of DC voltage	160V-960V						
DC voltage range at full load	190V-850V		240V-850V	290V-850V	380V-850V	480V-850V	575V-850V
Maximum input current per MPPT	11A/11A						
AC output data							
Nominal AC power	3000W	4000W	5000W	6000W	8000W	10000W	12000W
Maximum AC power	3300VA	4400VA	5500VA	6600VA	8800VA	11000VA	13200VA
Maximum AC current per phase	4.8A	6.4A	8.0A	9.6A	12.8A	15.9A	19.1A
Connection type/Grid nominal voltage	Three-phase3PH/N/PE,220V,230V,240V/380V,400V,415VorThree-phase3PH/PE,220V,230V,240V/380V,400V,415V						
Grid voltage range	184V~276V (according to the local grid standards)						
Grid nominal frequency	50Hz/60Hz						
Grid frequency range	45Hz~53Hz / 57Hz~63Hz (according to the local grid standards)						
Total harmonic distortion	<3%						
Power factor	1 (programmable +/-0.8)						
Active power adjustment range	0~100%						
Grid feed-in limitation	Feed-in adjustable from zero to the nominal power value*						
Efficiency							
Maximum efficiency	98%				98.3%		
Weighted efficiency (EURO)	97.5%				98%		
MPPT efficiency	>99.9%						
Night-time consumption	<1W						
Protections							
Internal interface protection	Yes						No
Safety protections	Anti islanding, RCMU, Ground Fault Monitoring						
DC reverse polarity protection	Yes						
DC switch	Integrated						
Surge protection	Yes						
Protection Class/Surge category	I/III						
Integrated dischargers	AC/DC MOV: Type III standard						
Standard							
EMC	EN 61000-6-1/2/3/4,						
Safety standard	IEC 62116, IEC 61727, IEC 61683, IEC 60068-1/2/14/30, IEC 62109-1/2						
Grid connection standard	CE, CGC, AS 4777, AS 3100, VDE-AR-N 4105, EN50438, G83/2, G59/3, C10/11, CEI 0-21						
Communication							
Communication interfaces	Wi-Fi (optional) RS485 (proprietary protocol), SD card						
Additional inputs or connections	I/O inputs for anti-reverse power controller connection						
Data storage on SD	25 years						
General data							
Permissible ambient temperature range	-25°C...+60°C (power limitation above 45°C)						
Topology	Transformerless						
Environmental protection rating	IP65						
Permissible relative humidity range	0%.....95% without condensation						
Maximum operating altitude	2000m						
Noise	< 29dB @ 1mt						
Weight	21Kg				22Kg		
Cooling	Natural ventilation						
Dimensions (H*L*D)	483mm*452mm*200mm						
Display	LCD						
Warranty	10 years						

* Possible through current sensor (ZST-ACC-TA) and anti-reverse power controller (ZSM-ZEROINJ)

AZZURRO - THREE-PHASE STRING INVERTER

10000TL/15000TL/17000TL/20000TL



The **ZCS Azzurro three-phase** inverters are the best solution for medium-sized photovoltaic systems installed in commercial and industrial buildings.

The Italian technology developed by ZCS makes the Azzurro series efficient, versatile and highly functional.

Available in sizes from 10 to 20kw, they have a very wide input range which makes them easy to configure and suitable for any type of need, in both new installations and retrofit projects.



ZCS AZZURRO TECHNOLOGY



- Performance optimisation
- Wi-Fi integration on ZCS platform for stable, effective and intelligent connectivity

MAXIMUM ENERGY EFFICIENCY



- Maximum performance 98.2%
- Stable efficiency in all working conditions
- Rapid and accurate MPPT algorithm
 - Dual input section with independent MPPTs

FLEXIBLE, ECONOMICAL AND EASY-TO-INSTALL SOLUTION



- Protection rating of IP65
- Integrated string combiner with different configuration options
 - Power Management Unit
 - 4-inch LCD graphic display
- Updates and diagnostics via SD card

RELIABILITY, DURABILITY AND FLEXIBILITY



- Rust-proof, corrosion-proof and UV-proof aluminium exterior casing
 - Natural ventilation cooling
 - Flexible and user-friendly management of operating parameters
- Optional Class II surge protection devices (AC and DC)
- Topology without transformer
 - 5 - 10 year ZCS warranty

INTELLIGENT GRID MANAGEMENT



- Dynamic management of grid feed-in
 - "Zero Grid Feed-in" functionality*
 - Remote control of the deliverable active/reactive power limit

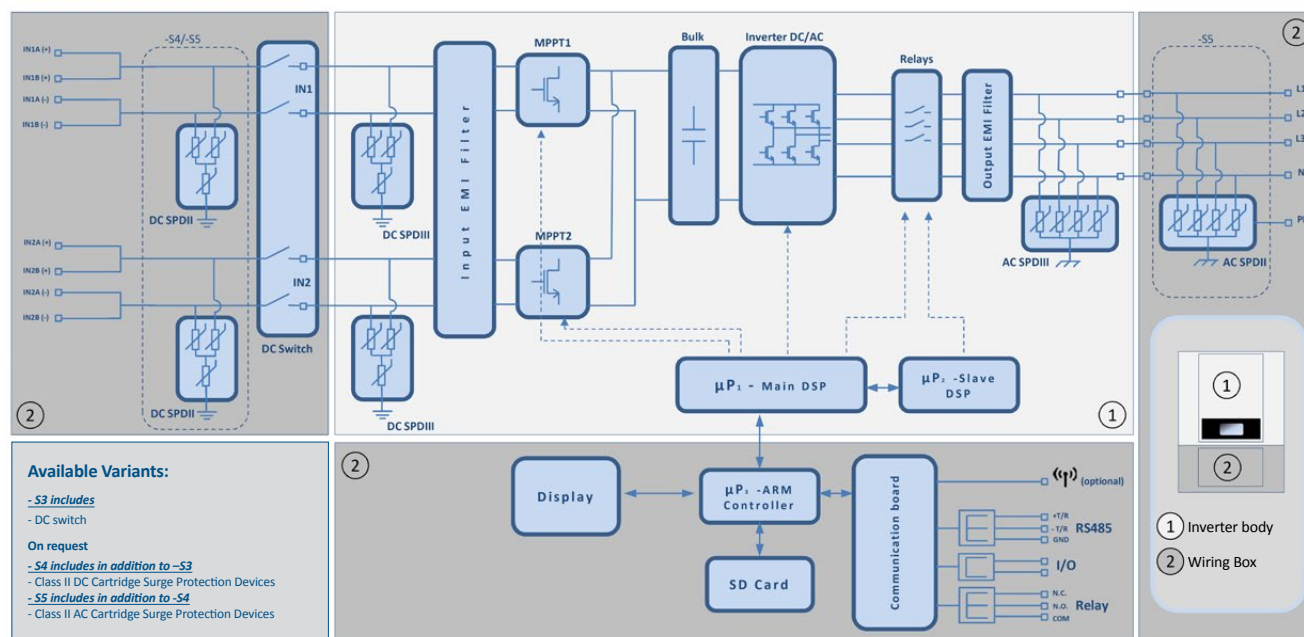
IDEAL FOR RETROFITTING



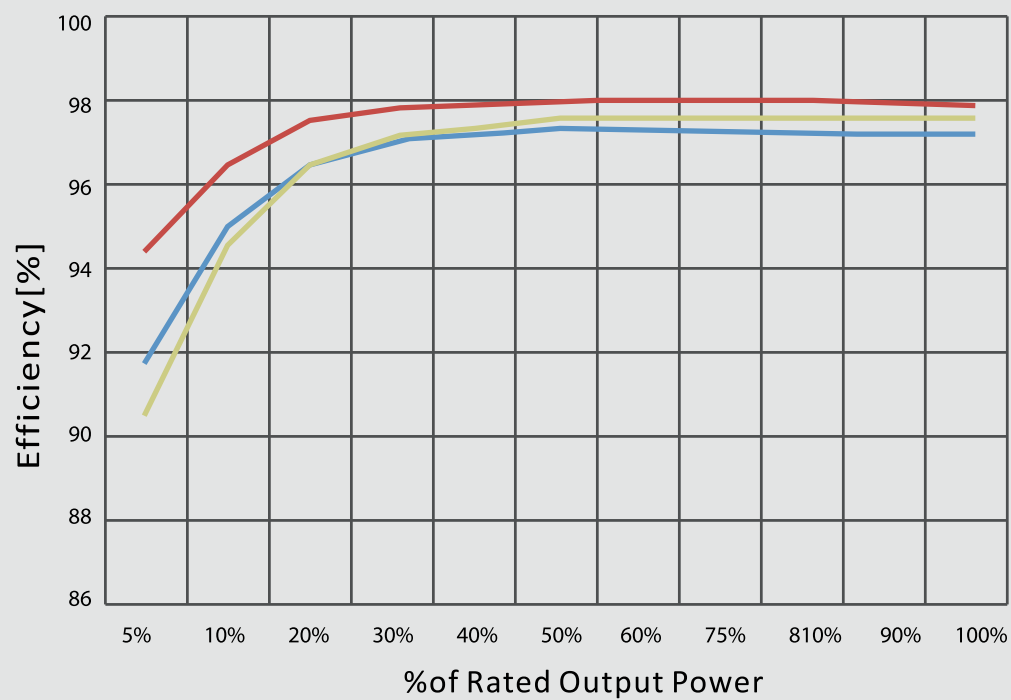
- Wide operating input range from 250V to 960V also suitable for small-sized string systems
 - Compact size
- Simple and user-friendly installation and configuration
 - Dual MPPT channel

*Possible through current sensor (ZST-ACC-TA) and anti-reverse power controller (ZSM-ZEROINJ)

FLOW CHART



EFFICIENCY CURVE



TECHNICAL DATA	10000TL	15000TL	17000TL	20000TL
DC input data				
Typical DC power	11000W	16500W	18700W	22000W
Maximum DC power for each MPPT	6750W (450V-850V)	10500W (500V-850V)		12000W (500V-850V)
No. of independent MPPTs/No. of strings per MPPT	2/2			
Maximum DC input voltage	1000V			
Activation voltage	350V			
Nominal DC input voltage	600V			
DC voltage MPPT range	250V-960V			
DC voltage range at full load	350V-850V			
Maximum input current for each MPPT	350V-850V	370V-850V	420V-850V	430V-850V
Maximum input current for each MPPT	15A/15A	21A/21A		24A/24A
AC output data				
Nominal AC power	10000W	15000W	17000W	20000W
Maximum AC power	10000VA	15000VA	17000VA	20000VA
Maximum AC current per phase	15A	22A	25A	29A
Connection type/Grid nominal voltage	Three-phase 3PH/N/PE,220V,230V,240V/380V,400V,415V or Three-phase 3PH/PE,220V,230V,240V/380V,400V,415V			
Grid voltage range	180V~270V (according to the local grid standards)			
Grid nominal frequency	50Hz/60Hz			
Grid frequency range	45Hz~53Hz / 57Hz~63Hz (according to the local grid standards)			
Total harmonic distortion	<3%			
Power factor	1 (programmable +/-0.8)			
Active power adjustment range	0~100%			
Grid feed-in limitation	Feed-in adjustable from zero to nominal power value*			
Efficiency				
Maximum efficiency	98.2%			
Weighted efficiency (EURO)	97.6%	97.9%		98%
MPPT efficiency	>99.9%			
Night-time consumption	<1W			
Protections				
Internal interface protection	No			
Safety protections	Anti islanding, RCMU, Ground Fault Monitoring			
DC reverse polarity protection	Yes			
DC switch	Integrated			
Surge protection	Yes			
Protection class/Surge category	I/III			
Integrated dischargers	AC/DC MOV: Type III standard, optional AC/DC dischargers type II (only S5 models)			
Standard				
EMC	EN 61000-6-1/2/3/4,			
Safety standard	IEC 62116, IEC 61727, IEC 61683, IEC 60068-1/2/14/30, IEC 62109-1/2			
Grid connection standard	CE, CGC, AS 4777, AS 3100, VDE-AR-N 4105, EN50438, G83/2, G59/3, C10/11, CEI 0-21, CEI 0-16			
Communication				
Communication interfaces	Wi-Fi (Optional), RS485 (proprietary protocol), SD card			
Additional inputs or connections	I/O inputs for anti-reverse power controller connection			
Data storage on SD	25 years			
General data				
Permissible ambient temperature range	-25°C...+60°C (power limitation above 45°C)			
Topology	Transformerless			
Environmental protection rating	IP65			
Permissible relative humidity range	0%.....95% without condensation			
Maximum operating altitude	2000m			
Noise	< 45dB @ 1mt			
Weight	45Kg		48Kg	
Cooling	Natural ventilation			
Dimensions (H*L*D)	707mm*492mm*240mm			
Display	LCD			
Warranty	10 years		5 - 10 years	

*Possible by connecting current sensor (ZST-ACC-TA) and anti-reverse power controller (ZSM-ZEROINJ)



AS4777 G83/2 G59/3

CE, CEI 0-21, CQC, IEC, VDE-AR-N4105/VDE-0126, EMC, C10/11, EN50438, RD1669

AZZURRO - THREE-PHASE STRING INVERTER

20000TL-G2/25000TL-G2

30000TL-G2/33000TL-G2



The **20-33kW ZCS Azzurro compact three-phase** inverter is the best solution for medium-sized photovoltaic systems installed in commercial and industrial buildings.

The Italian technology developed by ZCS makes the Azzurro series efficient, versatile and highly functional.

Available in capacities from 20 to 33kW, they have external "Plug & Play" connections and therefore are easy to install and configure. Their technical characteristics adapt to any type of need in both new installations and retrofit projects.



ZCS AZZURRO TECHNOLOGY

- Performance optimisation
- Wi-Fi integration on ZCS platform for stable, effective and intelligent connectivity



MAXIMUM ENERGY EFFICIENCY

- Maximum performance 98.6%
- Stable efficiency in all working conditions
- Rapid and accurate MPPT algorithm
- Dual input section with independent MPPTs



FLEXIBLE, ECONOMICAL AND EASY-TO-INSTALL SOLUTION

- Protection rating of IP65
- Fast connection without the need to access internal parts
- Possibility to communicate via Wi-Fi or Ethernet
- Power Management Unit
- 4-inch LCD graphic display
- Updates and diagnostics via SD card



RELIABILITY, DURABILITY AND FLEXIBILITY

- Rust-proof, corrosion-proof and UV-proof aluminium exterior casing
- Maximum DC voltage 1100 V
- Flexible and user-friendly management of operating parameters
- Topology without transformer
- 5 - 10 year ZCS warranty



INTELLIGENT GRID MANAGEMENT

- Dynamic management of grid feed-in
- "Zero Grid Feed-in" functionality*
- Remote control of the deliverable active/reactive power limit



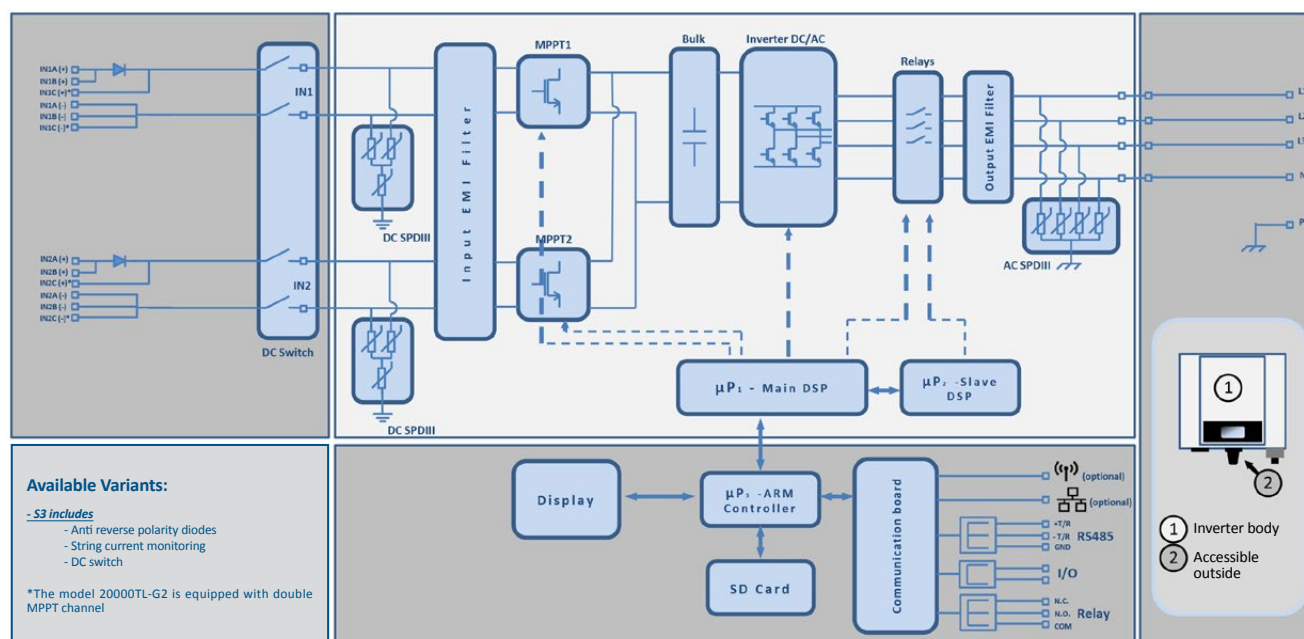
IDEAL FOR RETROFIT

- Wide operating input range from 230V to 960V also suitable for small-sized string plants
- Extremely compact size
- Simple and user-friendly installation and configuration
- Dual MPPT channel

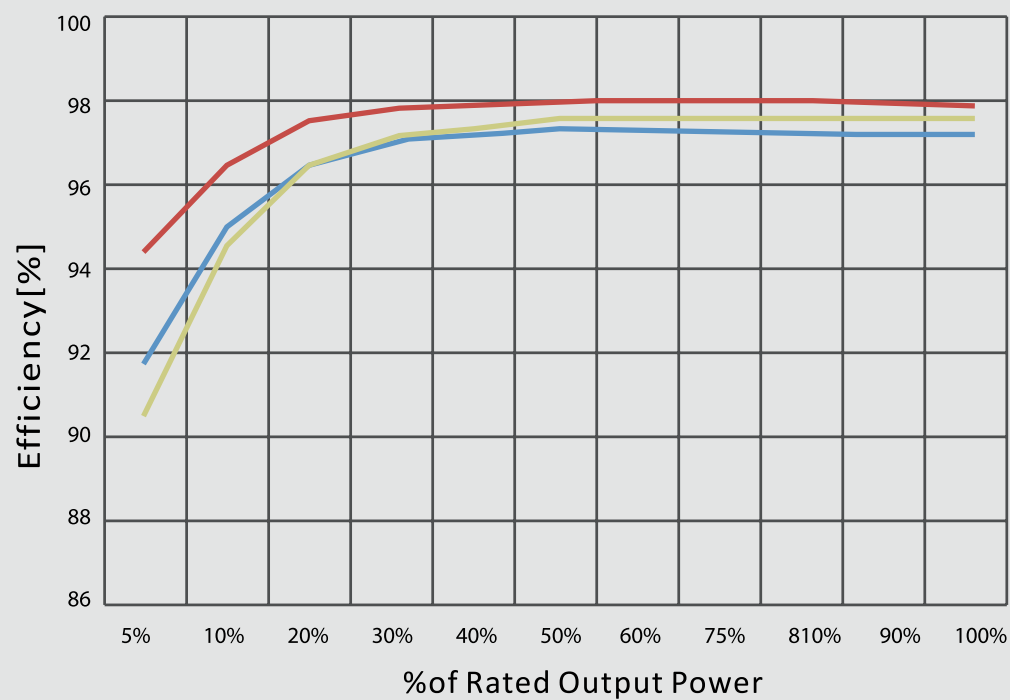


*Possible through anti-reverse power controller (ZSM-ZERO INJ)

FLOW CHART



EFFICIENCY CURVE



TECHNICAL DATA	20000TL-G2	25000TL-G2	30000TL-G2	33000TL-G2
DC input data				
Maximum DC power	26000W	32500W	39000W	42900W
Maximum DC power for each MPPT	13000W	16000W	18000W	20000W
No. of independent MPPTs/No. of strings per MPPT	2/2	2/3		
Maximum DC input voltage	1100V			
Activation voltage	250V			
Nominal DC input voltage	620V			
DC Voltage MPPT range	230V-950V			
DC voltage range at full load	480V-850V	460V-850V	520V-850V	580V-850V
Maximum input current for each MPPT	24A/24A	28A/28A	30A/30A	30A/30A
AC output data				
Nominal AC power	20000W	25000W	30000W	33000W
Maximum AC power	22000VA	27500VA	33000VA	36300VA
Maximum AC current per phase	32A	40A	48A	53A
Connection type/Grid nominal voltage	Three-phase 3PH/N/PE,220V,230V,240V/380V,400V,415V or Three-phase 3PH/PE,220V,230V,240V/380V,400V,415V			
Grid voltage range				
Grid nominal frequency	50Hz/60Hz			
Grid frequency range	45Hz~53Hz / 57Hz~63Hz (according to the local grid standards)			
Total harmonic distortion	<3%			
Power factor	1 (programmable +/-0.8)			
Active Power adjustment range	0~100%			
Grid feed-in limitation	Feed-in adjustable from zero to the nominal power value*			
Efficiency				
Maximum Efficiency	98.2%	98.4%		98.6%
Weighted efficiency (EURO)	98%	98.2%		
MPPT efficiency	>99.9%			
Night-time consumption	<1W			
Protection				
Safety protections	Anti-islanding, RCMU, Ground Fault Monitoring			
DC reverse polarity protection	Yes			
DC switch	Integrated			
Overheating	Yes			
Protection class/Surge category	I/III			
Integrated dischargers	AC/DC MOV: Type III standard			
Standard				
EMC	EN 61000-6-1/2/3/4,			
Safety standard	IEC 62116, IEC 61727, IEC 61683, IEC 60068-1/2/14/30, IEC 62109-1/2			
Grid connection standard	CE, CGC, AS 4777, AS 3100, VDE-AR-N 4105, EN50438, G83/2, G59/3, C10/11, CEI 0-21			
Communication				
Communication interface	Wi-Fi (Optional), RS485 (proprietary protocol), SD card			
Additional inputs or connections	I/O inputs for anti-reverse power controller connection			
Data storage on SD	25 years			
General information				
Permissible ambient temperature range	-25°C...+60°C (power limitation above 45°C)			
Topology	Transformerless			
Environmental protection rating	IP65			
Permissible relative humidity range	0%.....95% without condensation			
Maximum operating altitude	2000m			
Noise	< 30dB @ 1mt	< 45dB @ 1mt		
Weight	37Kg			
Cooling	Natural ventilation	Forced ventilation	Forced ventilation	Forced ventilation
Dimensions (H*L*D)	666mm*512mm*254mm			
Display	LCD			
Warranty	5 - 10 years			

*Possible by connecting current sensor (ZST-ACC-TA) and anti-reverse power controller (ZSM-ZEROINJ)



AS4777 G83/2 G59/3

CE, CEI 0-21, CQC, IEC, VDE-AR-N4105/VDE-0126, EMC, C10/11, EN50438, RD1669

AZZURRO - THREE-PHASE STRING INVERTER

30000TL/33000TL/40000TL



The **ZCS three-phase** inverters are the best solution for medium to large roof and ground mounted photovoltaic systems.

The advanced technology developed by ZCS makes the Azzurro series efficient, versatile and highly functional.

Available in sizes from 30 to 40kw and equipped with dual MPPT channel, their very wide input range makes them easy to configure and suitable for any type of need, in both new installations and retrofit projects.



ZCS AZZURRO TECHNOLOGY

- Performance optimisation
- Wi-Fi integration on ZCS platform for stable, effective and intelligent connectivity



MAXIMUM ENERGY EFFICIENCY

- Maximum performance 98.7%
- Stable efficiency in all working conditions
- Rapid and accurate MPPT algorithm
- Dual input section with independent MPPTs



FLEXIBLE, ECONOMICAL AND EASY-TO-INSTALL SOLUTION

- Protection rating of IP65
- Integrated string combiner with different configuration options
- Power Management Unit
- 4-inch LCD graphic display
- SD card for updates and diagnostics



RELIABILITY, DURABILITY AND FLEXIBILITY

- Rust-proof, corrosion-proof and UV-proof aluminium exterior casing
- Flexible and user-friendly management of operating parameters
- Optional Class II surge protection devices (AC and DC)
- Topology without transformer
- 5 - 10 year ZCS warranty



INTELLIGENT GRID MANAGEMENT

- Dynamic management of grid feed-in
- "Zero Grid Feed-in" functionality*
- Possibility to manage reactive power
- Remote control of the deliverable active/reactive power limit



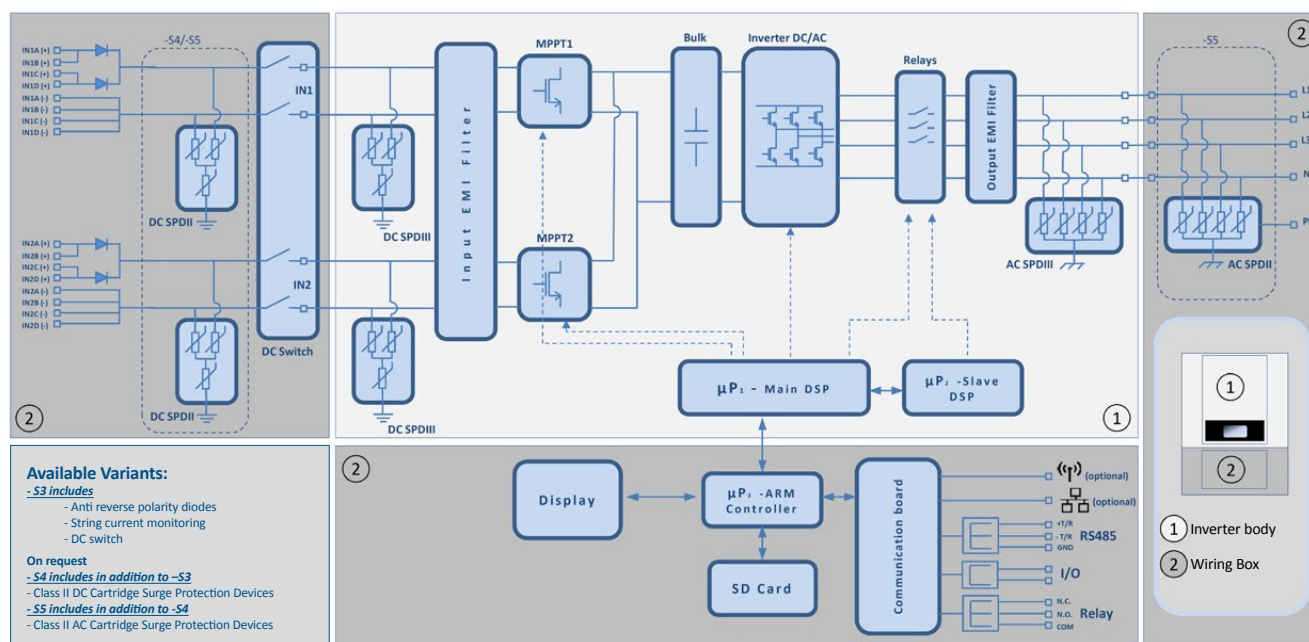
IDEAL FOR RETROFITTING

- Wide operating input range from 250V to 960V also suitable for small-sized string systems
- Compact size
- Simple and user-friendly installation and configuration
- Dual MPPT channel

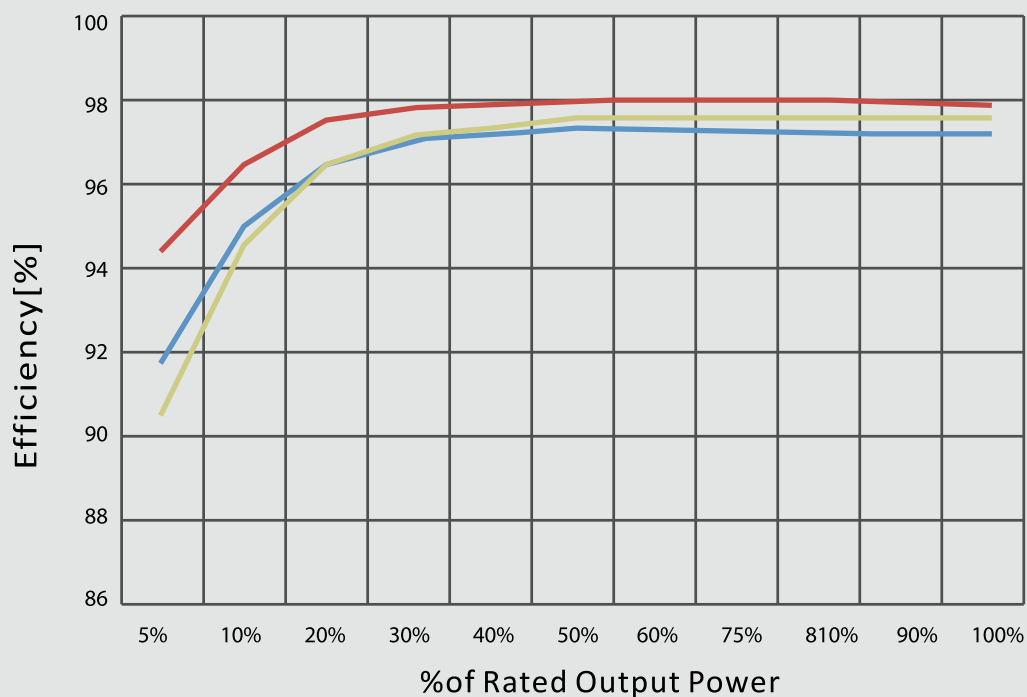


*Possible through current sensor (ZST-ACC-TA) and anti-reverse power controller (ZSM-ZEROINJ)

FLOW CHART



EFFICIENCY CURVE



TECHNICAL DATA	30000TL	33000TL	40000TL
DC input data			
Maximum DC power	33000W	36300W	44000W
Maximum DC power for each MPPT	15360W (480V-800V)	17000W (480V-800V)	20400W (570V-800V)
No. of independent MPPTs/No. of strings per MPPT	2/4		
Maximum DC input voltage	1000V		
Activation voltage	350V		
Nominal DC input voltage	600V	600V	700V
DC voltage MPPT range	250V-960V		
DC voltage range at full load	480V-800V		570V-800V
Maximum input current for each MPPT	32A/32A	35A/35A	35A/35A
AC output data			
Nominal AC power	30000W	33000W	40000W
Maximum AC power	30000VA	33000VA	40000VA
Maximum AC current per phase	43A	48A	48A
Type of connection/Nominal grid voltage	Three-phase 3PH/N/PE,220V,230V,240V/380V,400V,415V or Three-phase 3PH/PE,220V,230V,240V/380V,400V,415V		Three-phase 3PH/N/PE, 277V/480V Three-phase 3PH/PE, 277V/480V
Grid voltage range	180V~270V (according to the local grid standards)		243V~304V (according to the local grid standards)
Grid nominal frequency	50Hz/60Hz		
Grid frequency range	45Hz~53Hz / 57Hz~63Hz (according to the local grid standards)		
Total harmonic distortion	<3%		
Power factor	1 (programmable +/-0.8)		
Active power adjustable range	0~100%		
Grid feed-in limitation	Feed-in adjustable from zero to the nominal power value*		
Efficiency			
Maximum efficiency	98.5%		98.7%
Weighted efficiency (EURO)	98.2%		98.4%
MPPT efficiency	>99.9%		
Night-time consumption	<1W		
Protections			
Safety protections	Anti-islanding, RCMU, Ground Fault Monitoring		
DC reverse polarity protection	Yes		
DC switch	Integrated		
Surge protection	Yes		
Protection class/Surge category	I/III		
Integrated dischargers	AC/DC MOV: Type III standard, optional AC/DC dischargers type II (only S5 models)		
Standard			
EMC	EN 61000-6-1/2/3/4,		
Safety standard	IEC 62116, IEC 61727, IEC 61683, IEC 60068-1/2/14/30, IEC 62109-1/2		
Grid connection standard	CE, CGC, ZVRT, AS 4777, AS 3100, VDE-AR-N 4105, EN50438, G83/2, G59/3, C10/11, CEI 0-21, CEI 0-16		
Communication			
Communication interfaces	Wi-Fi (Optional), RS485 (proprietary protocol), SD card		
Additional inputs or connections	I/O inputs for anti-reverse power controller connection		
Data storage on SD	25 years		
General information			
Permissible ambient temperature range	-25°C...+60°C (power limitation above 45°C)		
Topology	Transformerless		
Environmental protection rating	IP65		
Permissible relative humidity range	0%.....95% without condensation		
Maximum operating altitude	2000m		
Noise	< 30dB @ 1mt	< 45dB @ 1mt	
Weight	50Kg		
Cooling	Natural ventilation	Forced ventilation with fans	Forced ventilation with fan
Dimensions (H*L*D)	767mm*564mm*290.5mm		
Display	LCD		
Warranty	5 - 10 years		

*Possible by connecting current sensor (ZST-ACC-TA) and anti-reverse power controller (ZSM-ZEROINJ)

AZZURRO - THREE-PHASE STRING INVERTER

50000TL/60000TL/70000TL



The **ZCS Azzurro Three-phase** inverters are the best solution for medium to large roof and ground mounted photovoltaic systems.

The advanced technology developed by ZCS makes the Azzurro series efficient, versatile and highly functional.

The wide input range of the three MPPTs, the DC and AC switch and the DC and AC surge protection devices make these inverters safe, robust, easy to configure and suitable for any need.



ZCS AZZURRO TECHNOLOGY



- Performance optimisation
- Wi-Fi integration on ZCS platform for stable, effective and intelligent connectivity

MAXIMUM ENERGY EFFICIENCY



- Maximum performance 98.6%
- Stable efficiency in all working conditions
- Rapid and accurate MPPT algorithm
- Triple input section with independent MPPTs

FLEXIBLE, ECONOMICAL AND EASY-TO-INSTALL SOLUTION



- Protection rating of IP65
- Integrated string combiner with different configuration options
- Power Management Unit
- 4-inch LCD graphic display
- SD card for updates and diagnostics

RELIABILITY, DURABILITY AND FLEXIBILITY



- Rust-proof, corrosion-proof and UV-proof aluminium exterior casing
- Flexible and user-friendly management of operating parameters
- Optional Class II surge protection devices (AC and DC)
- Topology without transformer
- 5 - 10 year ZCS warranty

INTELLIGENT GRID MANAGEMENT



- Dynamic management of grid feed-in
- "Zero Grid Feed-in" functionality*
- Possibility to manage reactive power
- Remote control of the deliverable active/reactive power limit

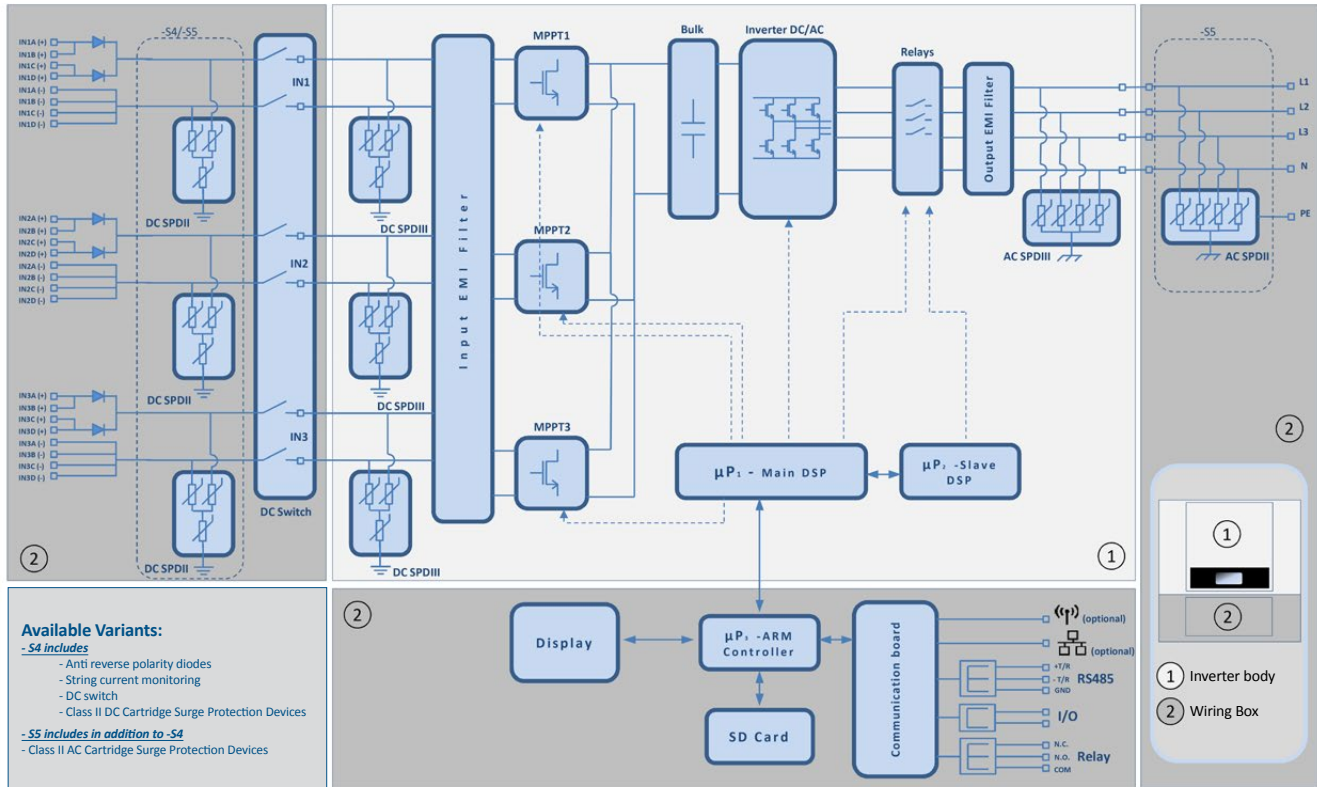
IDEAL FOR RETROFITTING



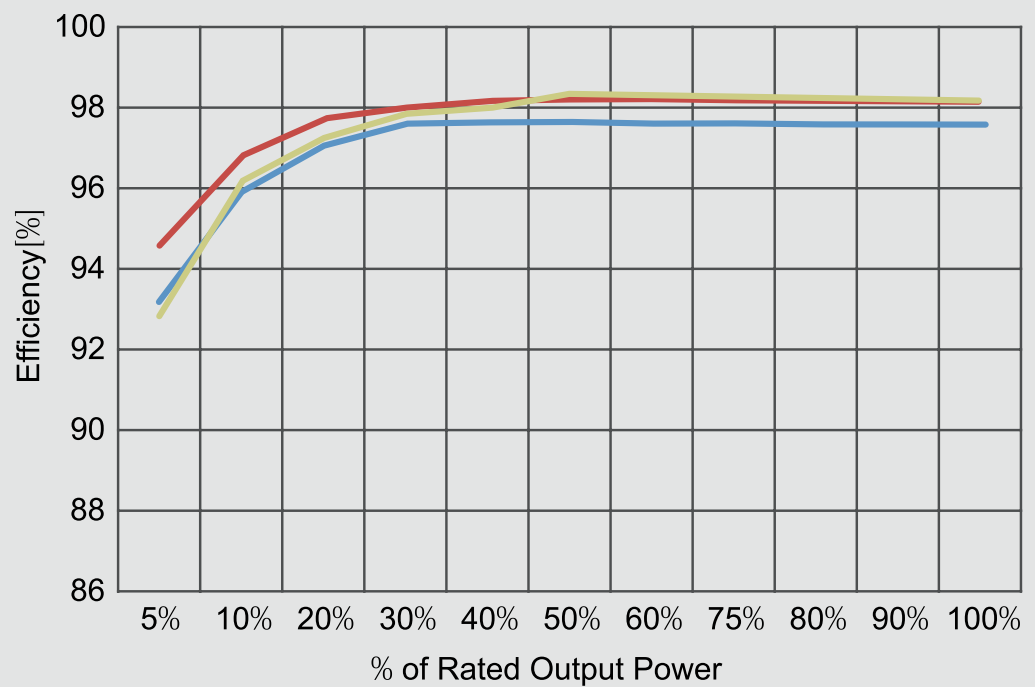
- Wide operating input range from 250V to 960V also suitable for small string systems
- Compact size
- Simple and user-friendly installation and configuration
- Triple MPPT channel

*Possible through current sensor (ZST-ACC-TA) and anti-reverse power controller (ZSM-ZEROINJ)

FLOW CHART



EFFICIENCY CURVE



TECHNICAL DATA	50000TL	60000TL	70000TL
DC input data			
Typical DC power	55000W	66000W	77000W
Maximum DC power for each MPPT	22000W (500V-800V)	22000W (530V-800V)	26000W (660V-800V)
No of independent MPPTs/No. of strings per	3/(4/3/3)	3/(4/4/4)	
Maximum DC input voltage	1000V		
Activation voltage	350V		
Nominal DC input voltage	600V		700V
MPPT range of DC voltage	250V-960V		
DC voltage range at full load	500V-800V	530V-800V	660V-800V
Maximum input current for each MPPT	40A/30A/30A	40A/40A/40A	
Maximum input current per string	12A		
AC output data			
Nominal AC power	50000W	60000W	70000W
Maximum AC power	50000VA	60000VA	70000VA
Maximum AC current per phase	80A	90A	
Connection type/Grid nominal voltage	Three-phase 3PH/N/PE,220V,230V,240V/380V,400V,415V or Three-phase 3PH/PE,220V,230V,240V/380V,400V,415V		Three-phase 3PH/N/PE, 277V/480V Three-phase 3PH/PE, 277V/480V
Grid voltage range	180V~270V (according to the local standards)		243V~304V (according to the local standards)
Grid nominal frequency	50Hz/60Hz		
Grid frequency range	45Hz~53Hz / 57Hz~63Hz (according to the local standards)		
Total harmonic distortion	<3%		
Power factor	1 (programmable +/-0.8)		
Active power adjustment range	0~100%		
Grid feed-in limitation	Feed-in adjustable from zero to the nominal power value*		
Efficiency			
Maximum efficiency	98.5%	98.6%	
Weighted efficiency (EURO)	98.3%	98.4%	
MPPT efficiency	>99.9%		
Night-time consumption	<1W		
Protections			
Safety protections	Anti-islanding, RCMU, Ground Fault Monitoring		
DC reverse polarity protection	Yes		
DC switch	Integrated		
Surge protection	Yes		
Protection class/Surge category	I/III		
Integrated dischargers	AC/DC MOV: Type III standard, optional AC/DC dischargers type II (only S5 models)		
Standard			
EMC	EN 61000-6-1/2/3/4,		
Safety standard	IEC 62116, IEC 61727, IEC 61683, IEC 60068-1/2/14/30, IEC 62109-1/2		
Grid connection standard	CE, CGC, ZVRT, AS 4777, AS 3100, VDE-AR-N 4105, EN50438, G83/2, G59/3, C10/11, CEI 0-21, CEI 0-16		
Communication			
Communication interface	Wi-Fi (Optional), RS485 (proprietary protocol), SD card		
Additional inputs or connections	I/O inputs for anti-reverse power controller connections		
Data storage on SD	25 years		
General information			
Permissible ambient temperature range	-25°C...+60°C (power limitation above 45°C)		
Topology	Transformerless		
Environmental protection rating	IP65		
Permissible relative humidity range	0%.....95% without condensation		
Maximum operating altitude	2000m		
Noise	< 60dB @ 1mt		
Weight	68Kg	70Kg	
Cooling	Forced ventilation		
Dimensions (H*L*D)	737mm*713mm*297 mm		
Display	LCD		
Warranty	5 - 10 years		

*Possible by connecting current sensor (ZST-ACC-TA) and anti-reverse power controller (ZSM-ZEROINJ)



AS4777 G83/2 G59/3

CE, CEI 0-21, CQC, IEC, VDE-AR-N4105/VDE-0126, EMC, C10/11, EN50438, RD1669

AZZURRO - RETROFIT STORAGE INVERTER

3000SP



The **ZCS Azzurro retrofit storage** inverter is the ideal solution for optimising energy independence in residential applications. With a nominal power of 3kW and a storage capacity of up to 30kWh, it is suitable for any type of need on new constructions. Moreover, Azzurro's AC connection makes it compatible with any type of technology (solar, wind, etc.) and with any type of inverter, thus making it the ideal solution for updating and optimising existing installations.



SIMPLE AND RELIABLE



- Energy exchange directly in AC, without the need for external control or interface systems
- LCD graphic display for local monitoring
- Remote monitoring system through APP for viewing consumption, PV production, energy stored and exchanged with the grid

SIMPLE INSTALLATION



- Compatible with all existing inverters already connected to the grid
- Does not require changes or upgrades to the existing electrical system thanks to the use of an open-core current sensor

FLEXIBLE DISCHARGE SOLUTION



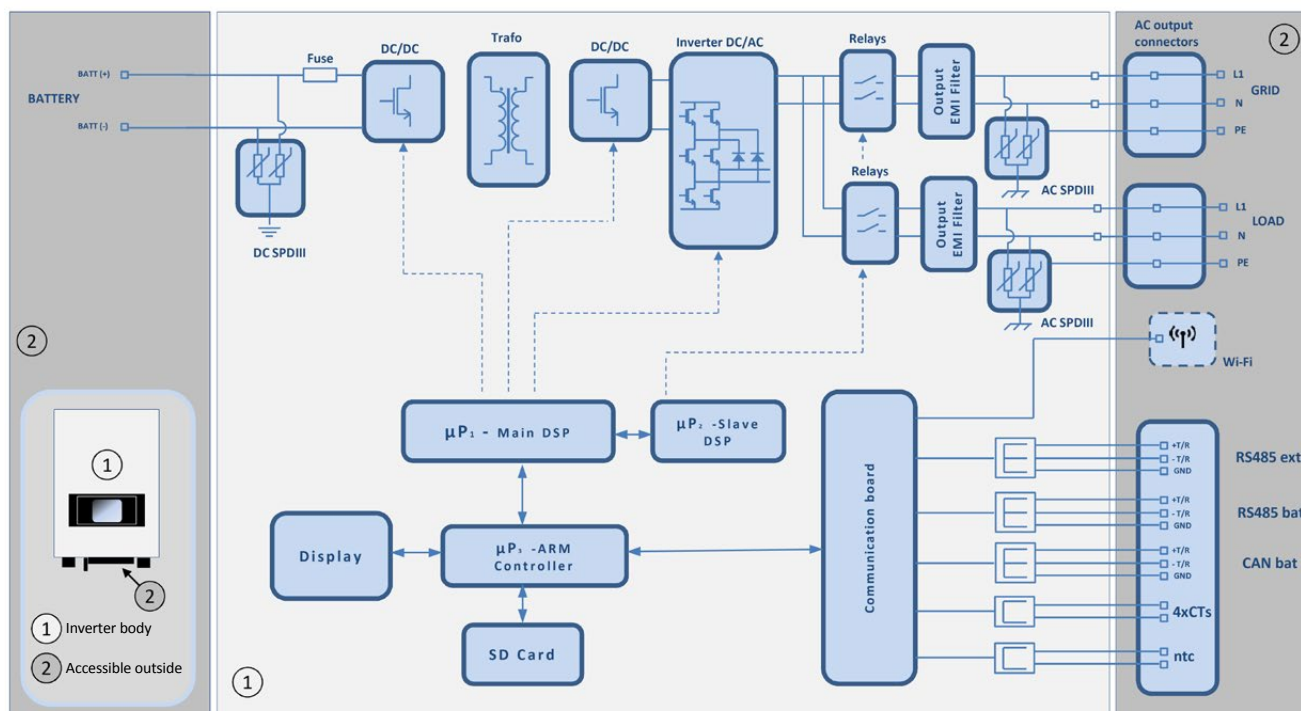
- Flexible charging/discharging management in accordance with local standards
- Maximisation of self-consumption above 80%
- Suitable for installing on both single-phase and three-phase systems
- Unit compatible with both lithium batteries and other 48V technologies

FUNCTIONALITY IN THE EVENT OF GRID DISCONNECTION

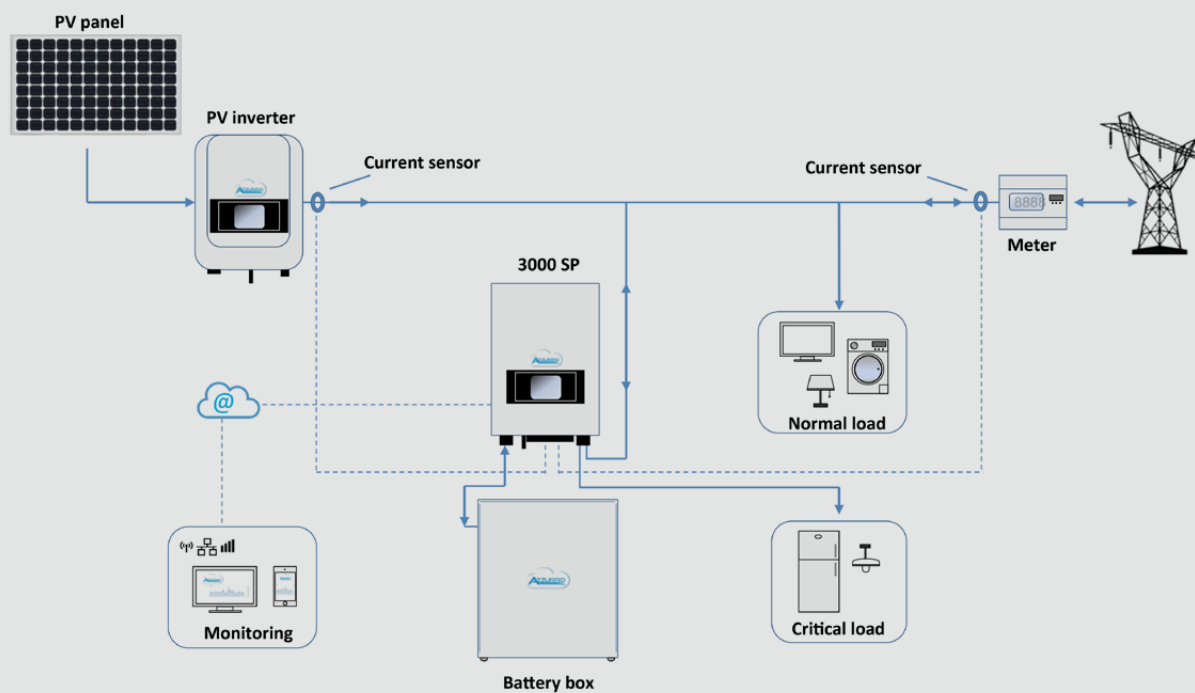


- Stand-Alone support mode guarantees continuity of operation in the event of a power failure through the Emergency Power Supply (EPS) function

FLOW CHART



STORAGE DIAGRAM



TECHNICAL DATA - 3000SP

Battery Connection technical data

Type of compatible battery	Lithium Ion / Lead Gel / Salt Water, etc.
Nominal voltage	48V
Permissible voltage range	42V-58V
Recommended battery capacity	50Ah-200Ah
Maximum charging/discharging power	3000W
Permissible temperature range *	-10°C-50°C
Maximum charging current	65A (programmable)
Maximum discharging current	65A (programmable)
Charging curve (Lithium)	Managed by battery BMS
Charging curve (other type of battery)	3 adaptive stages with maintenance
Depth of Discharge (DoD)	Lithium ion: 10%-90% (programmable); Lead Gel: 10%-50% (programmable)

AC input (grid side)

Nominal power	3000W
Maximum power	3000VA
Maximum current	13A
Type of connection/nominal voltage	Single-phase L/N/PE 220,230,240V
AC voltage range	180V-270V (according to the local grid standards)
Nominal frequency	50Hz/60Hz
AC frequency range	44Hz-55Hz / 54Hz-66Hz (according to the local grid standards)
Total harmonic distortion	< 3%
Power factor	1 default (programmable +/- 0.8)

EPS (Emergency Power Supply) output

Power supplied in EPS**	3000VA
EPS output voltage and frequency	230V 50Hz/60Hz
Output current in EPS	13A
Total harmonic distortion	< 3%
Switch time	< 3s default (programmable from 1 a 999s)

Efficiency

Maximum charging efficiency	94.1%
Maximum discharging efficiency	94.3%
Consumption in stand-by	< 5W

Protections

Safety protections	Anti-islanding, RCMU, Ground Fault Monitoring
Surge protection	Yes
Protection rating	I
Battery soft-start	Yes

Standard

EMC	EN 61000-6-1/2/3/4,
Safety standard	IEC 62116, IEC 61727, IEC 61683, IEC 60068-1/2/14/30, IEC 62109-1/2
Grid connection standard	CEI 0-21, RD1699, AS4777, VDE 0126-1-1, G83/2, EN50438, VDE-AR-N4105, UTEC15/712-1

Communication

Communication interface	Wi-Fi, RS485 (proprietary protocol), SD card, CAN 2.0 (for battery connection)
Additional inputs and connections	Input for DC current sensor connection + 3 inputs for AC current sensor connections
Data storage on SD	25 years

General data

Permissible ambient temperature range	-25°C...+60°C (power limitation above 45°C)
Topology	high frequency isolation
Environmental protection rating	IP65
Permissible relative humidity range	0%.....95% without condensation
Maximum operating altitude	2000m
Noise	< 25dB @ 1mt
Weight	16Kg
Cooling	Natural ventilation
Dimensions (H*L*D)	532mm*360mm*173mm
Display	LCD
Warranty	5 - 10 years

* Standard value for lithium batteries; maximum operating range between +10°C/+40°C

** The power supplied in EPS mode depends on the type and capacity of the batteries



AS4777 G83/2 G59/3

CE, CEI 0-21, CQC, IEC, VDE-AR-N4105/VDE-0126, EMC, C10/11, EN50438, RD1669

AZZURRO - INVERTER FOR HYBRID STORAGE

HYD 3000-ES/HYD 3600-ES/HYD 4000-
ES/HYD 5000-ES/HYD 6000-ES



ZCS Azzurro Hybrid storage inverter is the ideal solution for optimising energy independence in residential applications.

With a nominal power of 3 to 6kW and a storage capacity of up to 30kWh, it adapts to any type of requirement on new installations.

SIMPLE AND RELIABLE



- Automatic management of the energy flows from the photovoltaic system, battery and grid
- LCD graphic display for local monitoring
- Remote monitoring system through APP for visualising consumption, PV production, energy stored and exchanged with the grid

SIMPLE INSTALLATION



- On-board Energy Metre
- Does not require changes or upgrades to the existing electrical system thanks to the use of an open-core current sensor

FLEXIBLE DISCHARGE SOLUTION



- Flexible charging/discharging management in accordance with local standards
- Maximisation of self-consumption above 80%
- Possibility of operation in zero grid feed-in mode
- Unit compatible with both lithium batteries and other 48V technologies

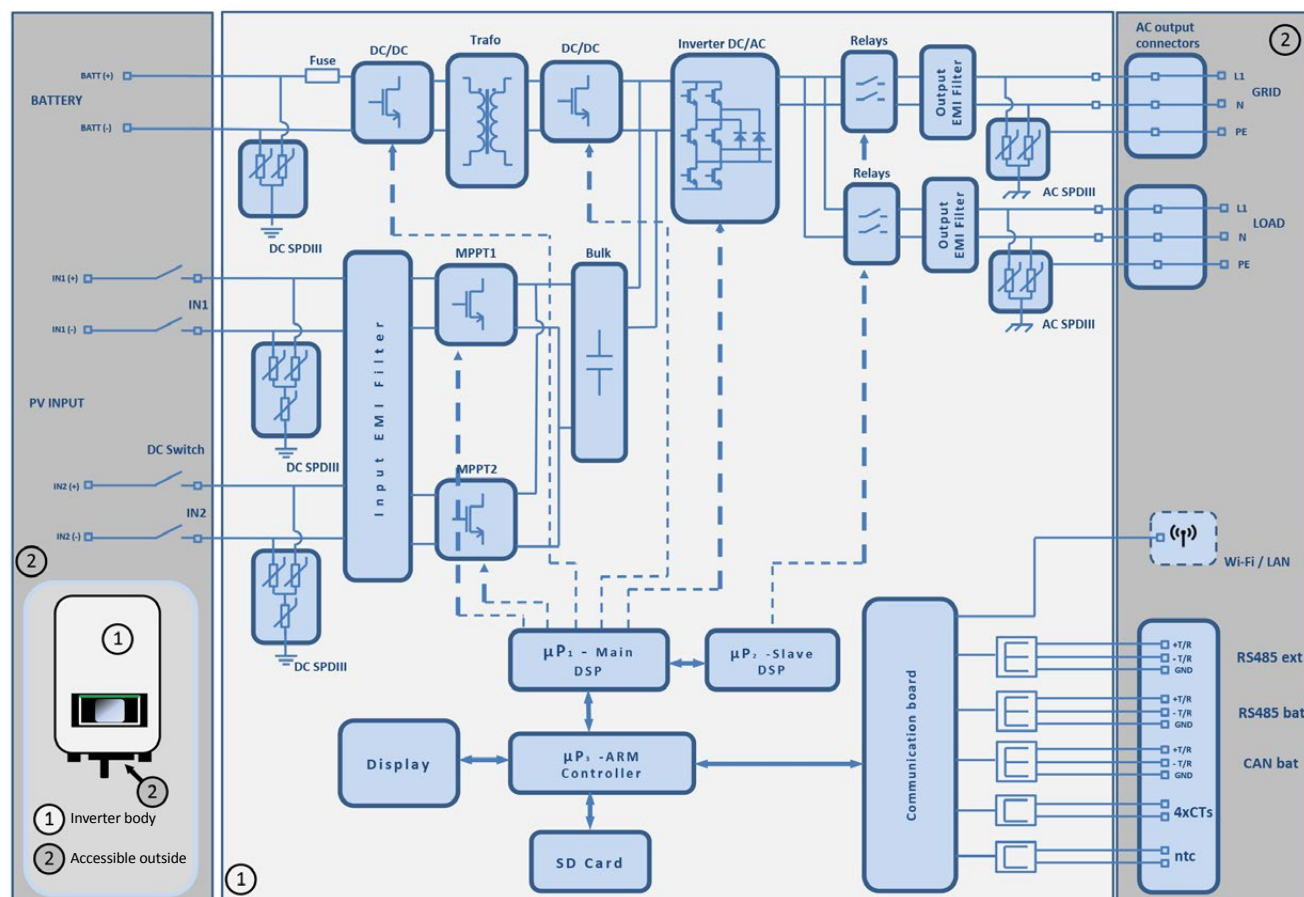
FUNCTIONALITY IN THE EVENT OF GRID DISCONNECTION



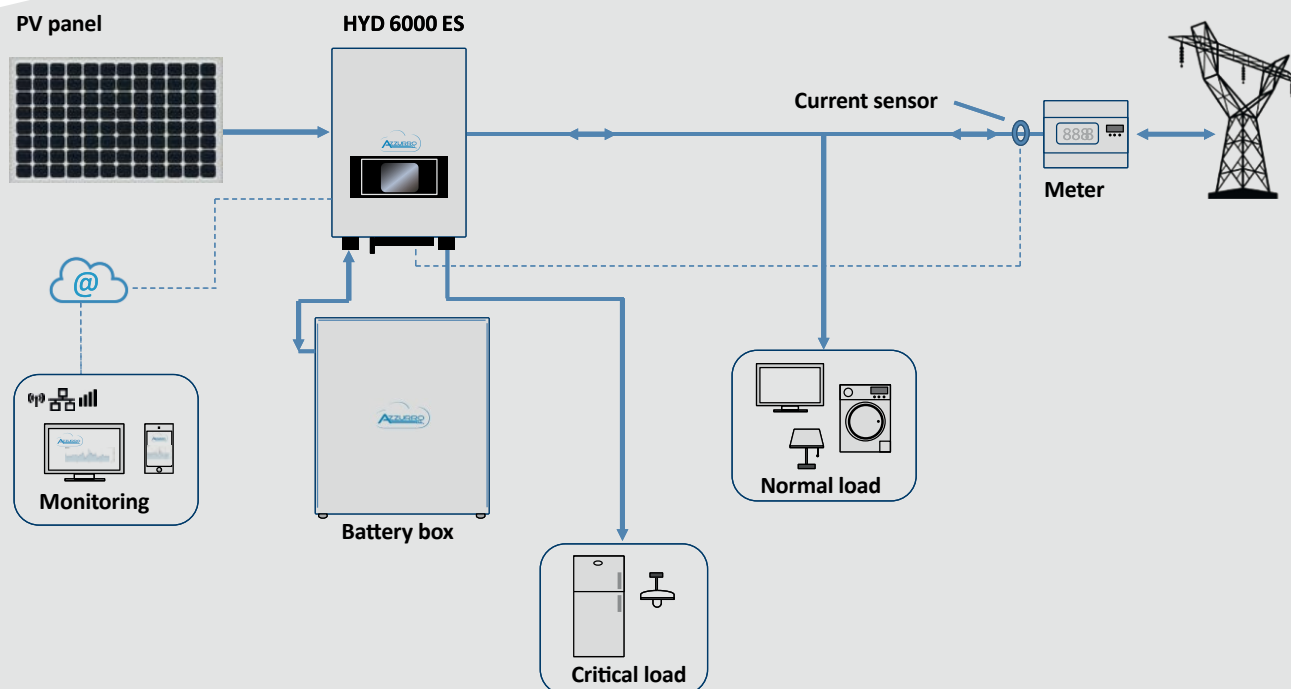
- Stand-Alone support mode guarantees continuity of operation and "island" operation, both from the photovoltaic source and from the battery, in the event of a power failure.



FLOW CHART



STORAGE DIAGRAM



TECHNICAL DATA	HYD 3000 ES	HYD 3600 ES	HYD 4000 ES	HYD 5000 ES	HYD 6000 ES
DC Input (photovoltaic)					
Maximum DC Power	3500W	4000W	4400W	5500W	6600W
Maximum DC power for each MPPT	2000W (160V-520V)	2400W (180V-520V)	2600W (200V-520V)	3000W (250V-520V)	3500W (300V-520V)
No. of independent MPPTs/no. of strings per MPPT	2/1				
Maximum input voltage	600V				
Activation voltage	120V				
Nominal input voltage	360V				
MPPT range of DC voltage	90V-580V				
DC voltage range at full load	160V-520V	180V-520V	200V-520V	250V-520V	300V-520V
Maximum input current for each MPPT	12A/12A				
Battery Technical Data					
Type of compatible battery	Lithium ion / Lead Gel / Salt water etc.				
Nominal voltage	48V				
Permissible voltage range	42V-58V				
Recommended battery capacity	50Ah-200Ah				
Maximum charging/discharging power	3000W				
Permissible temperature range *	-10°C-50°C				
Maximum charging current	65A (programmable)				
Maximum discharging current	65A (programmable)				
Charging curve (Lithium)	Managed by battery BMS				
Charging curve (other battery types)	3 adaptive stages with maintenance				
Depth of Discharge (DoD)	Lithium ion: 0%-90% (programmable); Lead Gel: 0%-50% (programmable)				
AC Output (grid side)					
Nominal power	3000W	3680W	4000W	5000W	6000W
Maximum power	3000VA	3680VA	4000VA	5000VA	6000VA
Maximum current	13.7A	16A	18.2A	22.8A	27.3A
Connection type/Nominal voltage	Single-phase L/N/PE 220,230,240V				
AC voltage range	180V-276V (according to the local standards)				
Nominal frequency	50Hz/60Hz				
AC frequency range	44Hz-55Hz / 54Hz-66Hz (according to the local standards)				
Total harmonic distortion	< 3%				
Power factor	1 default (programmable +/- 0.8)				
Grid feed-in limitation	Programmable from display				
EPS (Emergency Power Supply)					
Power output in EPS ** in the absence of production by photovoltaic	3000VA				
EPS output frequency and voltage	Single-phase 230V 50Hz/60Hz				
Output current in EPS	13A				
Apparent peak power in the absence of production by photovoltaic	4000VA per 10s				
Total harmonic distortion	< 3%				
Switch time	5s default (programmable 1s-60s)				
Efficiency					
Maximum efficiency	97.6%	97.6%	97.6%	97.8%	98.0%
Weighted efficiency (EURO)	97.2%	97.2%	97.2%	97.3%	97.5%
MPPT efficiency	>99.9%				
Maximum battery charge/discharge efficiency	94.6%				
Consumption in stand-by	< 5W				
Protections					
Internal interface protection	Yes				
Safety protections	Anti-islanding, RCMU, Ground Fault Monitoring				
DC reverse polarity protection	Yes				
DC switch	Integrated				
Overheating protection	Yes				
Protection class/Surge category	I/III				
Integrated dischargers	AC/DC MOV: Type III standard				
Soft Start Battery	Yes				
Standard					
EMC	EN 61000-6-1/2/3/4,				
Safety standard	IEC 62116, IEC 61727, IEC 61683, IEC 60068-1/2/14/30, IEC 62109-1/2				
Grid connection standard	CEI 0-21, NB/T32004-2013, AS4777, VDE 0126-1, G83/2, G59/3, EN50438, VDE-AR-N4105				
Communication					
Communication interfaces	Wi-Fi (Optional), RS485 (proprietary protocol), SD card, CAN 2.0 (for battery connection)				
Additional inputs or connections	Input for current sensor connection				
Data storage on SD	25 years				
General data					
Permissible ambient temperature range	-30°C...+60°C (power limitation above 45°C)				
Topology	Transformerless / High frequency isolation battery output				
Environmental protection degree	IP65				
Permissible relative humidity range	0%.....95% without condensation				
Maximum operating altitude	2000m				
Noise	< 25dB @ 1mt				
Weight	20.5Kg				
Cooling	Natural convention				
Dimensions (H*L*D)	566mm*394mm*173mm				
Display	LCD				
Warranty	5 - 10 years				

* Standard value for lithium batteries; maximum operating range between +10°C/+40°C

** Power output in EPS mode depends on the type of batteries and the status of the system (e.g. residual capacity, temperature)



AS4777 G83/2 G59/3

CE, CEI 0-21, CQC, IEC, VDE-AR-N4105/VDE-0126, EMC, C10/11, EN50438, RD1669

AZZURRO - BATTERIES FOR STORAGE OR HYBRID SYSTEMS



The **batteries** for **ZCS Azzurro hybrid inverters and storage** systems are the ideal solution for optimising energy independence in residential applications.

Capable of being paralleled up to a capacity of 30kWh, they are the ideal devices for **ZCS Azzurro** storage inverters. They configure themselves automatically, so there is no need for manual settings.

The Lithium Ion or Lithium-Iron-Phosphate technology allows efficient use even at high depths of discharge, thus optimising energy storage and reuse. Easy installation and long service life make these batteries advantageous and practical.



SIMPLE AND RELIABLE



- Self-configuring with Azzurro hybrid or storage inverters
- Service life longer than market standards
- Depth of Discharge up to 90%
- 10 year warranty

SIMPLE INSTALLATION



- Communication cables, power and battery parallel connection cables included
- Installation on the ground or wall by means of the appropriate brackets
- Possibility of installing additional batteries at any time during the life of the system
- A total capacity of up to 30kWh can be installed

DC Input Data

Type	ZCS-Weco HeSu4k4	ZCS - Pylontech US2000B PLUS
Technology	Lithium-Iron-Phosphate	
Dimensions (H*L*P)	480mm*165mm*560mm (+20mm for feet)	440mm*410mm*89mm (only one battery); 530mm*280mm*677mm (storage box with 2 batteries); 530mm*495mm*677mm (storage box with 4 batteries)
Weight	53Kg	24Kg
Protection rating	IP20	IP20
Assembly	On ground or wall	On ground or on wall in storage box
Operating temperature when charging	-20°C - +45°C	0°C - +50°C
Operating temperature when discharging	-20°C - +60°C	-10°C - +50°C
Permissible relative humidity range	0....95% without condensation	0....95% without condensation
Maximum operating altitude	2000m	2000m
Operating cycles under standard conditions	7000	>6000
Estimated useful life under standard conditions *	10 years	10 years
Maximum no. of batteries that can be installed in parallel on inverters	5	12
Certifications	IEC 61600-6-3: 2017, 61600-3-2:2014, 61000-3-3:2013, 61600-6-2007, CE, UN 38.3	TUV, CEI-021, CE, UN 38.3
Warranty	10 years	10 years
Communication	RS232, RS485, CAN bus	RS232, RS485, CAN bus
Cell rebalancing	Automatic, real time	Automatic (with SOC above 95%)

Capacity Data

Nominal capacity	4.45kWh / 86Ah	2.2kWh / 50Ah
Maximum capacity	4.95kWh	2.4kWh
Depth of Discharge (DoD)	Up to 100% of nominal capacity	80%

* Standard operating conditions for batteries: 25°C, 40% humidity, Depth of Discharge (DoD) 80%



AS4777 G83/2 G59/3

CE, CEI 0-21, CQC, IEC, VDE-AR-N4105/VDE-0126, EMC, C10/11, EN50438, RD1669

AZZURRO - MONITORING SYSTEMS

The **ZCS Azzurro monitoring** systems are the ideal solution for the complete control and display of all the important parameters of all types of PV systems.

The wide range of options allows meeting any requirement: from the basic solution to more complete and complex monitoring solutions.

The most complete monitoring solutions allow connecting external devices and a separate power supply unit for monitoring not only the inverters, but also the consumption of the entire system at all hours of the day.

SIMPLE AND RELIABLE



- Communication protocols with automatic inverters
- Possibility to monitor up to 31 inverters

SIMPLE INSTALLATION



- Plug-and-play installation
- Easy to access and easy to configure

TECHNICAL DATA	ZSM-WIFI-KIT	ZSM-WIFI-EXT	ZSM-ETH-EXT	ZSM-DATALOG-04	ZSM-DATALOG-10	ZSM-RMS-001/M200	ZSM-RMS-001/M1000
General data							
Installation	Inside the inverter on communication board	On the mechanics of the inverter (dedicated slot)	Free				
Communication with inverter	RS232			RS485			
Number of connectable inverters	1			Up to 4	Up to 10	Up to 31 (for installations with total power < 200kW)	Up to 31 (for installations with total power >200kW)
Power supply	Inside inverter			External by means of dedicated power supply (included)			
Optional back-up battery	No			Yes			
Configurability	Access to dedicated WebServer page			No configuration required			
Connection with APP / Portal	Wi-Fi			Ethernet			
Other communication ports	No			2x USB 2.0, HDMI, I/O			
Additional features	No			Option to connect to external metres and sensors for monitoring consumption and reporting to recognised customs agencies			
List of compatible inverters	List 1*	List 2**		All storage and hybrid inverters of the Azzurro series			

*List 1: 1100TL, 1600TL, 2000TL, 2700TL, 3000TL, 3000TLM, 3680TLM, 4000TLM, 4600TLM, 5000TLM, 6000TLM (integrated in the WS models), ME3000SP (integrated)

**List 2: 3KTL-G2, 3.6KTL-G2, 4KTL-G2, 4.6KTL-G2, 5KTL-G2, 6KTL-G2, 3.3KTL, 4.4KTL, 5.5KTL, 6.6KTL, 8.8KTL, 11KTL, 12KTL, 10000TL, 15000TL, 17000TL, 20000TL, 30000TL, 33000TL, 36000TL, 40000TL, 50000TL, 60000TL, 70000TL, 20000TL-G2, 25000TL-G2, 30000TL-G2, 33000TL-G2, HYD 3000-ES, HYD 4000-ES, HYD 5000-ES, HYD 6000-ES,



Wi-Fi Module



Ethernet Module



Easy Datalogger



Professional Datalogger

APP AND PORTAL FOR MONITORING THE PV SYSTEMS



The entire range of ZCS Azzurro inverters can be easily monitored using the ZCS APP and portal. The ZCS Azzurro APP can be downloaded free of charge from Google Play and the App Store and is easy to configure.

Both systems allow creating graphs indicating production, consumption and other essential information. The data is automatically updated every 5 minutes.



EASY AND USER-FRIENDLY



- APP downloadable from Play Store
- Customisable graphs
- The entire range of inverters can be monitored
- User-friendly interface

ZCS AZZURRO APP





THE AZZURRO TECHNICAL ASSISTANCE

Azzurro's technical assistance is available in all countries where ZCS operates, through a network of local service centres.

ZCS Azzurro provides Customers with an Assistance Service that can be reached:

- through the ASSISTANCE section of the website **www.zcsazzurro.com**

The ZCS Azzurro Customer Service will handle your request for assistance within 24 hours of receiving the request.

INSTALLATION AND COMMISSIONING

Would you like assistance in sizing your new photovoltaic system or in retrofitting existing systems? Are you having trouble configuring your ZCS Azzurro Inverter?

Do you have doubts on how to correctly use and install your inverter?

Our technical assistance service is able to offer support by ticket for pre-sales and after-sales requests, so our customers can receive all the information they need.

TRAINING AND INSTRUCTION

ZCS offers various training and instruction programs on various aspects relating to solar energy. The training and instruction sessions are organised both at the ZCS offices and externally at the premises of our distributors or in hotel meeting rooms or conference centres.

ZCS encourages all its customers to participate in some training courses, so that they are able to efficiently install the system and make it fully compliant with the applicable regulations.

The ZCS training courses normally include general and theoretical presentations aimed at developing technical knowledge on the inverters, as well as practical exercises with “open inverter” aimed at explaining all the product features, the various applications, installation and commissioning procedures, programming, maintenance and fault identification.

The courses are open to all operators in the sector and are not limited to technical professionals.

SPARE PARTS AND ACCESSORIES

The general approach, i.e. the normal procedure in the event of a fault, for the ZCS inverter is to replace the faulty inverter with a new or reconditioned one.

However, there may be cases where it is easier to change some accessories in order to make the entire system start again. This is the case with the fan tray in three-phase inverters, or the battery connection cables in the storage systems.

The list of available accessories and spare parts can be found in our price lists and the parts can be ordered from our distributors in the same way that the inverters are ordered. ZCS keeps an extensive stock of accessories and spare parts, which are available for immediate shipment.

MAINTENANCE - EXTENDED WARRANTY - UPDATES - RETROFIT

The ZCS Azzurro string inverters do not require any special maintenance since a faulty inverter is always replaced by a new inverter.

However, since the expected service life of an inverter is about 20 years, an annual inspection of the general conditions of each inverter is recommended.

ZCS offers this type of service at very convenient prices and conditions both during and after the warranty period. Contact our offices for a quote.

Each inspection visit will involve checking the proper functioning of the inverter by measuring the efficiency and checking all the parameters useful for the life of the unit itself. In addition, the machine software will be updated if the unit does not have the latest software release and a report will be issued

certifying the results of the inspection.

REPAIR AND REPLACEMENT

Faulty inverters can be replaced by a new inverter or a reconditioned inverter.

ZCS uses partner companies to restore the Azzurro inverters to their original condition. This process, which we call “reconditioning”, brings the inverter back to its original conditions of performance and efficiency.

Reconditioning includes total inspection of the machine, complete cleaning, analysis and replacement of any parts that need to be replaced. The reconditioned inverter undergoes a complete test cycle and is supplied with the warranty remaining after expiry of the ten years of the original inverter.

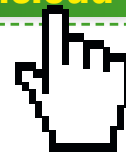
SERVICE PARTNERS

ZCS can intervene within 24 hours in any region of Italy and in any country in Europe. ZCS has built a relationship of trust with the installers in charge of intervening at its customers. If an installer is not available, ZCS provides assistance through its own direct staff or through local service partners.





www.casagreen.cloud



Let's turn on the Future

From the perfect encounter between technology and nature stems the Zucchetti Centro Sistemi Casa Green. A new concept of residence that hold in itself the countless advantages of technology and the benefits of nature. In the Casa Green smart ecofriendly products take care of the environment, of the efficiency of the energy, of the yard and the cleanliness of the swimming pool.

The innovative solutions of Zucchetti Centro Sistemi improve the quality of your life and bring the future in your home.

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ROBOT

THE ROBOTIC LAWNMOWER

NEMHO
2

THE POOL CLEANING ROBOT

AZZURRO
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THE FUTURE

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Let's contribute to switch on a better future.

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INNOVATION TECHNOLOGY,
CHOOSE TO CHANGE
PERSPECTIVE.**







THE INVERTER THAT LOOKS AT THE FUTURE

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ZUCCHETTI
Centro Sistemi



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