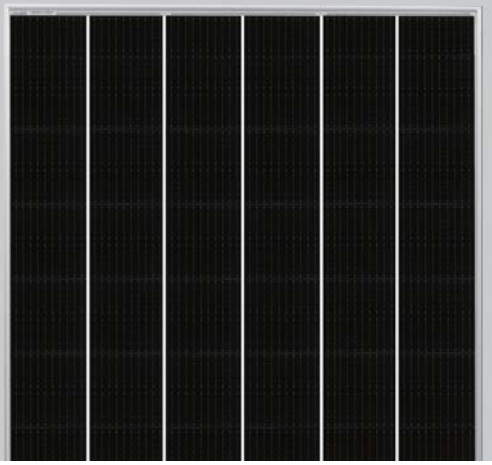
TR 78M
560-580 Watt
Mono-facial

Tiling Ribbon (TR) Technology

Positive power tolerance of 0~+3%

(Draft)

TIGER Pro



KEY FEATURES

TR technology + Half Cell
TR technology with Half cell aims to eliminate the cell gap to increase module efficiency (mono-facial up to 21.21%)

MBB instead of 5BB
MBB technology decreases the distance between bus bars and finger grid line which is benefit to power increase.

Higher lifetime Power Yield
2% first year degradation,
0.55% linear degradation

Best Warranty
12 year product warranty,
25 year linear power warranty

Strengthened Mechanical Support
5400 Pa snow load, 2400 Pa wind load

PV CYCLE · TÜVRheinland CERTIFIED · CE

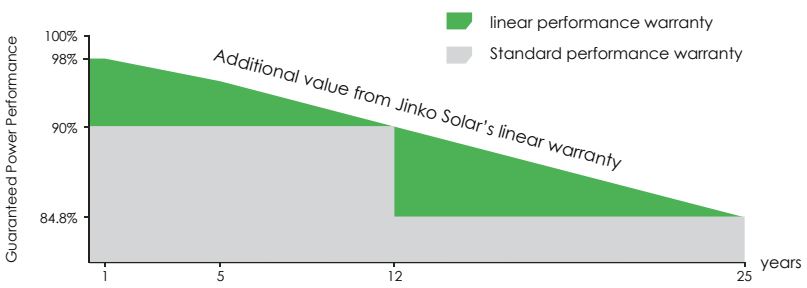
POSITIVE QUALITY™ Continuous Quality Assurance · CLEAN ENERGY COUNCIL MEMBER

ISO9001:2015, ISO14001:2015, ISO45001:2018 certified factory

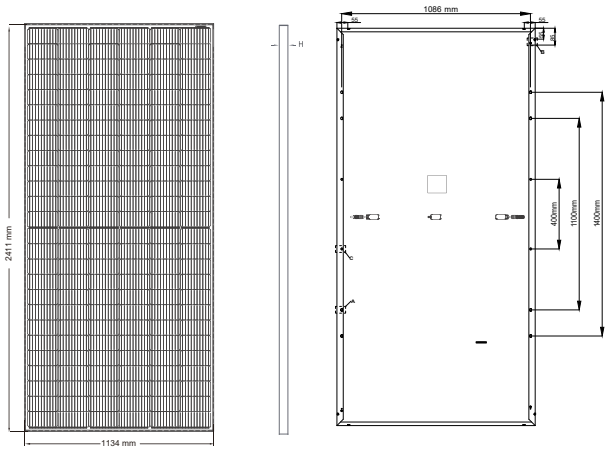
IEC61215, IEC61730 certified product

LINEAR PERFORMANCE WARRANTY

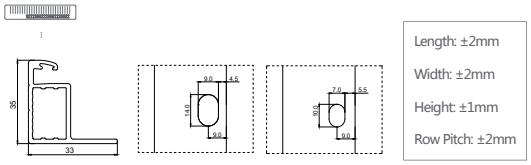
12 Year Product Warranty • 25 Year Linear Power Warranty
0.55% Annual Degradation Over 25 years



Engineering Drawings



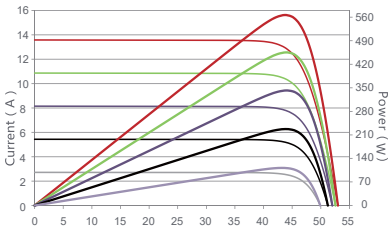
Front Side Back



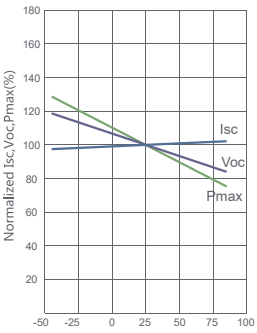
Length: ±2mm
Width: ±2mm
Height: ±1mm
Row Pitch: ±2mm

Electrical Performance & Temperature Dependence

Current-Voltage & Power-Voltage Curves (565W)



Temperature Dependence of Isc,Voc,Pmax



Mechanical Characteristics

Cell Type	P type Mono-crystalline
No.of cells	156 (2×78)
Dimensions	2411×1134×35mm (94.92×44.65×1.38 inch)
Weight	30.93 kg (68.2 lbs)
Front Glass	3.2mm,Anti-Reflection Coating, High Transmission, Low Iron, Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP68 Rated
Output Cables	TUV 1×4.0mm² (+): 290mm , (-): 145 mm or Customized Length

Packaging Configuration

(Two pallets = One stack)

31pcs/pallets, 62pcs/stack, 496pcs/ 40'HQ Container

SPECIFICATIONS

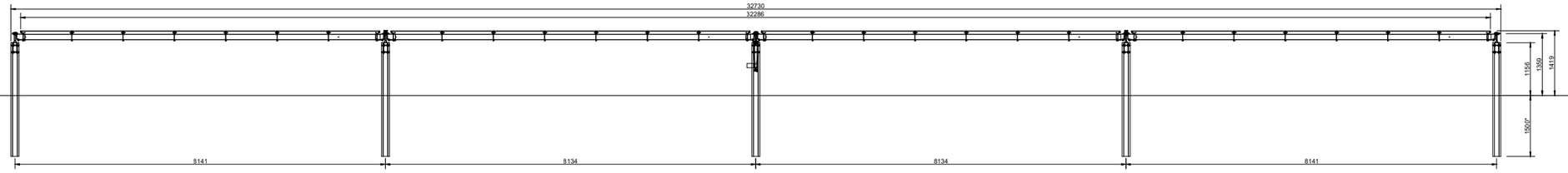
Module Type	JKM560M-7RL4-V		JKM565M-7RL4-V		JKM570M-7RL4-V		JKM575M-7RL4-V		JKM580M-7RL4-V	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax)	560Wp	417Wp	565Wp	420Wp	570Wp	424Wp	575Wp	428Wp	580Wp	432Wp
Maximum Power Voltage (Vmp)	44.31V	40.63V	44.43V	40.72V	44.55V	40.80V	44.67V	40.89V	44.78V	40.97V
Maximum Power Current (Imp)	12.64A	10.25A	12.72A	10.32A	12.80A	10.39A	12.88A	10.46A	12.96A	10.53A
Open-circuit Voltage (Voc)	52.90V	49.93V	53.00V	50.03V	53.10V	50.12V	53.20V	50.21V	53.30V	50.31V
Short-circuit Current (Isc)	13.50A	10.90A	13.58A	10.97A	13.66A	11.03A	13.74A	11.10A	13.82A	11.16A
Module Efficiency STC (%)	20.48%		20.67%		20.85%		21.03%		21.21%	
Operating Temperature(℃)	-40℃~+85℃									
Maximum system voltage	1500VDC (IEC)									
Maximum series fuse rating	25A									
Power tolerance	0~+3%									
Temperature coefficients of Pmax	-0.35%/℃									
Temperature coefficients of Voc	-0.28%/℃									
Temperature coefficients of Isc	0.048%/℃									
Nominal operating cell temperature (NOCT)	45±2℃									

*STC: Irradiance 1000W/m² Cell Temperature 25°C AM=1.5

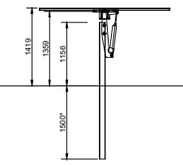
NOCT: Irradiance 800W/m² Ambient Temperature 20°C AM=1.5 Wind Speed 1m/s

* Power measurement tolerance: ± 3%

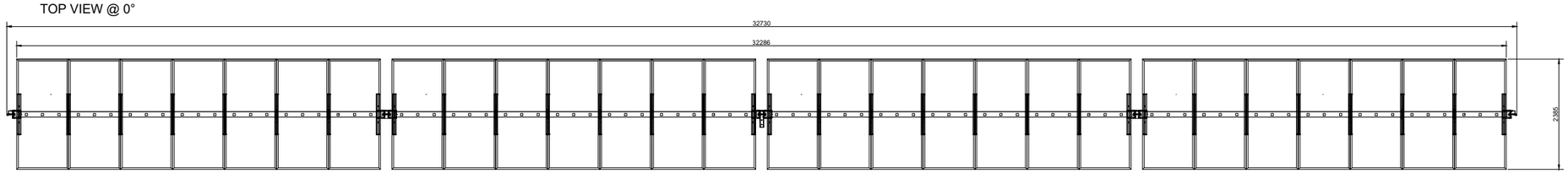
TRJHT28PDP
FRONT VIEW @ 0°



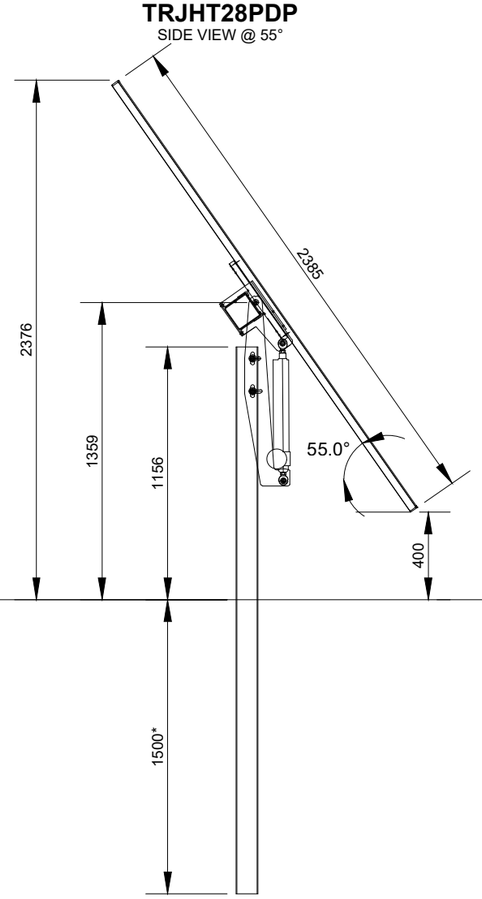
TRJHT28PDP
SIDE VIEW @ 0°



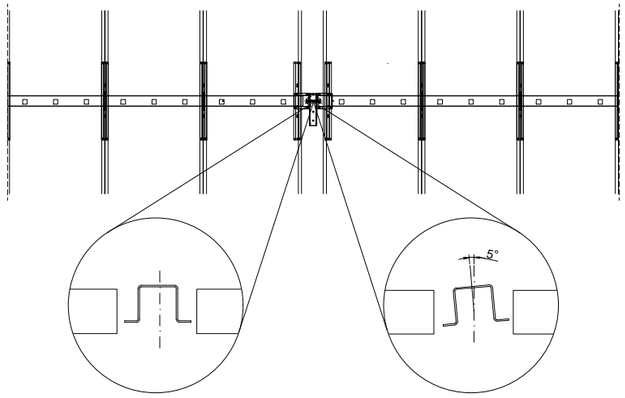
TRJHT28PDP
TOP VIEW @ 0°



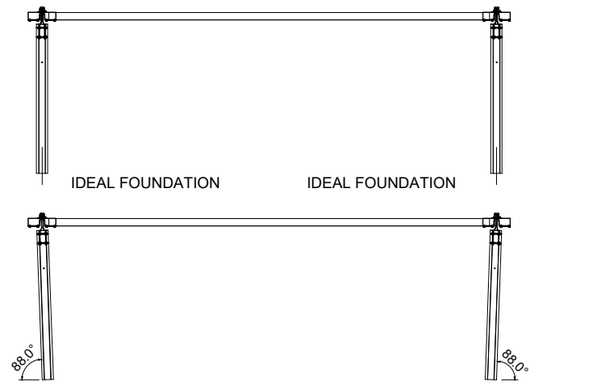
TRJHT28PDP
SIDE VIEW @ 55°



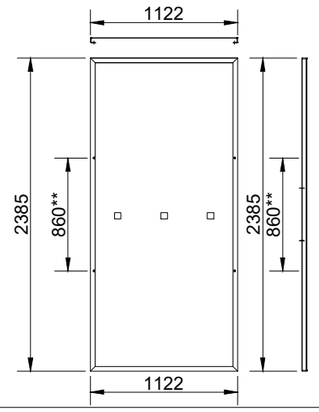
FOUNDATION TWIST ERROR RECOVERY



FOUNDATION ANGLE ERROR RECOVERY



PHOTOVOLTAIC MODULE
Jinko Tiger PV Module - 580 Wp



MATERIAL CHARACTERISTICS

STEEL
Structural steel - yeld strength in accordance with structural calculations

SPHERICAL BEARINGS
Bronze / Stainless steel

SPACERS
According to environmental conditions of the site

SCREWS, NUTS and WASHERS
According to environmental conditions of the site

GALVANIZATION
All steel parts will be galvanized according to environmental conditions of the site to have a design lifetime of 30 years

SOLARFIELDS

The supplier reserves the right to change any particular before executive design release

* Preliminary Value to be recalculated after geotechnical analysis and pull out tests
** Preliminary Value to be confirmed after final PV module choice

PROJECT DESCRIPTION
TRJHT28PDP

CLIENT

STATE PROJECT
Preliminary Drawing

RAPPRESENTATION
Annex 1
TRJHT28PDP General Assembly Drawing

REFERENCE DRAWING NUMBER PROJECT	DATE EMISSION:	FORMAT DRAWING:
	SCALE:	SCALE DWT:

REV.	DATE	DESCRIPTION	DESIGNED	CHECKED	APPROVED

DESIGN
CONVERT
A valmont COMPANY

CONVERT TRJ

SINGLE AXIS TRACKER

the **future** is on **track**

CONVERT

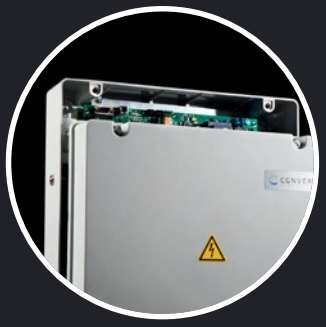
sales@convertitalia.com | www.convertitalia.com

BEARING TRANSMISSION

Spherical self lubricated plain bearing of Convert design to compensate inaccuracies and error in mechanical structure installation

CONTROL BOARD

Easy to install and self-configuring control board. The integrated GPS always triggers the right geographical location to the system for solar automatic tracking

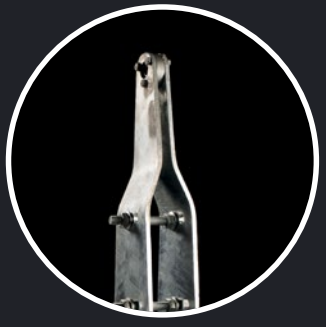


DRIVEN GEAR

“Independent raw” solution, with unique independent double dust protection ring AC engine

STRUCTURE

Completely balanced and modular, the TRJ structure does not require specialized personnel for installation and assembly



CONVERT **TRJ** - TECHNICAL **DATA SHEET**

TECHNICAL SPECIFICATION

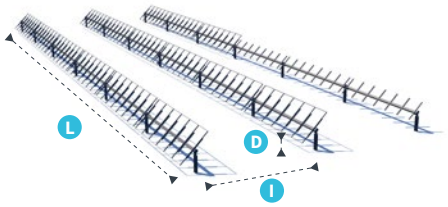
Tracker type	Horizontal single axis North-South alignment and East-West tracking with backtracking and indpendent rows
Tracking control system	Control system controlled by astrnomical clock; self-configuring; no sensor required
Maximum tracking error	± 1° (-0,015% power max)
Control system architecture	1 electronic control board for 10 rows with GPS system integrated and anemometer for wind safety
PV-modules type	Crystalline pv - modules
Number of modules per row	From 30 up to 42 pv modules per row
Max. peak power per tracker	Up to 13,44 kWp @ pv - modules 320 Wp
Rotation angle	Up to ± 55°
Driven gear	1 linear actuator (IP65) per row: 230V -50 Hz (CE); 240V -60 Hz (CE,UL)
Power supply and consumption	- GRID POWER AC input (27 kWh/year per tracker) - SELF-POWERED from PV-modules (no battery, no grid, patented system)
Monitoring and data feeds	Real-time local or remote communication data provided via ModBus from control board to SCADA
Communication	- WIRE - RS485 cable between electronic control board and SCADA - WIRELESS network
Maximum wind speed	According to the local codes
Foundation	Driven pile; ground screw; concrete
Grounding method	Self-grounding structure
Material	Galvanized steel
Ground coverage ratio	Configurable on the basis of project design: from 0.35 to 0.50
Availability	> 99%
Warranty	10 years on structure components; 5 years on drive and control system

INSTALLATION TOLERANCE

ASSEMBLY ERROR RECOVERY

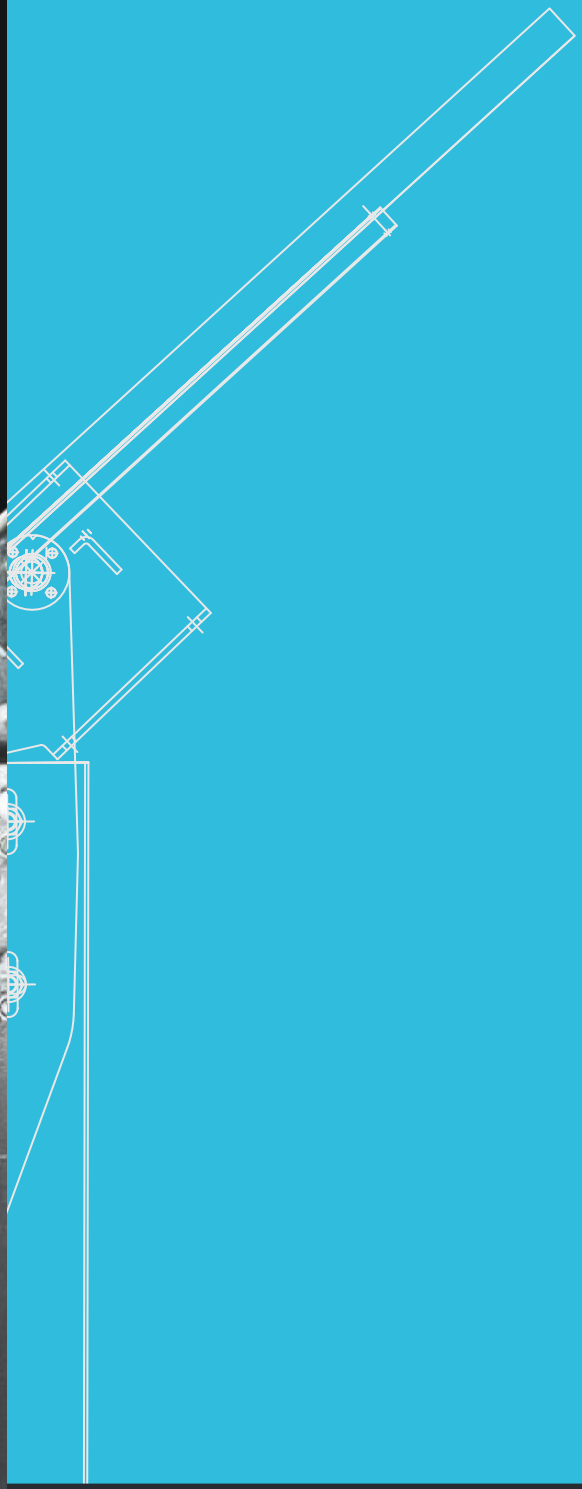
Height	± 20 mm
North/South	± 35 mm
East/West	± 20 mm
Inclination	2°
Twist	5°
Land grading	± 3° North/South; no limitation East/West

CONFIGURABLE FOR SPECIFIC PROJECT



- **I** **Inter-axis** min. dimension: **4 m**
- **L** **Lenght** from **31** to **43 m**
- **D** **Height above ground** **0,35 m**

PLUG & TRACK



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CONVERT **TRJ**

SINGLE AXIS TRACKER

Technical Data Sheet
English Version

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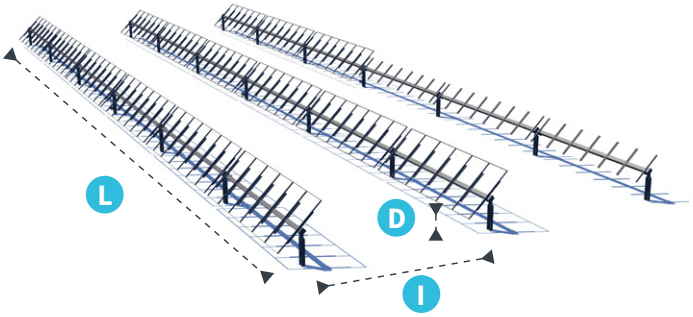

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L **Lenght**
from **31** to **43 m**

D **Height above ground**
0,35 m

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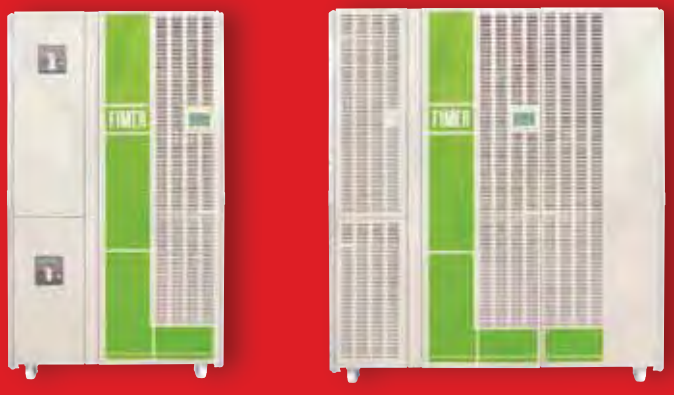
MV

MV CENTRAL INVERTER



1500V

MV CENTRAL INVERTER
TRANSFORMERLESS
1.500V

The FIMER TL series centralized modular inverters have been specifically designed for the employment of large-scale photovoltaic power plants and MT connection to the grid applications. These inverters conserve the architectural and modular characteristics of all FIMER centralized inverters and the connection to the electricity grid through MT transformer ensures extremely high yields, approximately 99%. Thanks to modularity the configuration of these machines is extremely flexible and they ensure production continuity eliminating machine downtime.

FIMER machines are also provided with a series of included accessories, which our competitors often supply as optional:

- DC and AC switch connections and safety side.
- serial and Ethernet interface.
- Integrated Datalogger and Energy Meter.
- 4,3" digital touch screen display.
- Lightning protection devices (SPD) PV side.
- Acquisition field sensors (radiation and temperature).
- Energy meter reading (via pulse input S_0) and analog inputs.

Gli inverter modulari FIMER serie TL centralizzati sono stati specificatamente progettati per applicazioni di campi fotovoltaici di grandi dimensioni e allacciamento a reti elettriche di distribuzione MT. Questi inverter conservano la caratteristica architettura modulare di tutti gli inverter centralizzati FIMER e il collegamento alla rete elettrica attraverso il trasformatore MT garantisce dei rendimenti estremamente elevati nell'ordine del 99%.
Grazie alla modularità queste macchine risultano estremamente flessibili come configurazione e garantiscono una costanza nella produzione eliminando il fermo macchina.

Le macchine FIMER hanno anche una serie di accessori già inclusi che spesso i concorrenti forniscono come optional:

- Interruttori di connessione e sicurezza lato CC e CA.
- Interfaccia seriale e Ethernet.
- Datalogger Integrato ed Energy Meter.
- Display digitale touch screen da 4,3".
- Dispositivi di protezione contro i fulmini (SPD) lato FV.
- Acquisizione sensori di campo (irraggiamento e temperatura).
- Lettura contatore di energia (mediante ingresso impulsivo S_0) e ingressi analogici.

ADVANTAGES & FEATURES

MAX POWER 1.500V

FIMER Centralized inverters with MT connection to the electricity distribution are completely innovative machines. The MPS technology (Modular Power System), owned and patented by FIMER, allows the improvement of three main features of a PV inverter:

> PERFORMANCE
> LIFETIME
> ELIMINATION OF MACHINE DOWN-TIMES

PERFORMANCE

FIMER inverter is modular and, as already explained, this peculiarity is due to the inverter's conversion stage which is formed by more IGBT 75kWp power modules working in parallel in output on the AC power distribution grid: if we take as reference a 1.025 kWp machine, this is formed by ten 102.5 kWp modules, instead a 300 kWp inverter is made of four 50kWp modules, and so on. The modularity also extends to magnetic devices (inductors), capacitors energy conversion and all cards and electronic devices for control and regulation (whose one piece is always available for each power module). This makes FIMER machines unique on the market. Why? Because if any inverter of the competitors, for example a 1.025 kWp, usually needs to magnetize the power circuits devices (f.e. inductances, line filter, capacitors on the grid side, etc..) about 10% of the nominal power, which corresponds in this case to about 102.5 kWp, FIMER machine must magnetize always and only one 50kWp module at a time which in our case corresponds to a magnetizing energy consumption of 0.8 kWp, a consumption that is applied only to the modules that at that time the machine is switching on and is making work. This means that FIMER machine produces about 11% more than any other manufacturer in the world thanks to this unique feature. By installing a FIMER inverter, you will be able to pay-off your investment in the first years of functioning and product basis warranty.

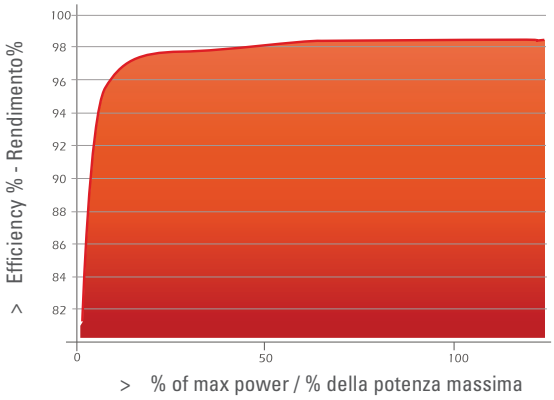
LIFETIME

A FIMER inverter lasts longer! To last longer electronics need to work at low temperatures. FIMER inverter power modules turn on and off in a sequential manner so they are always cool, (or they operate in low temperatures and they are always checked) so they are destined to last longer. Furthermore in this way the use of cooling fans is also optimized, they absorb and dissipate less energy turning less and less time, which ensures higher performance and profitability to the PV Inverter.

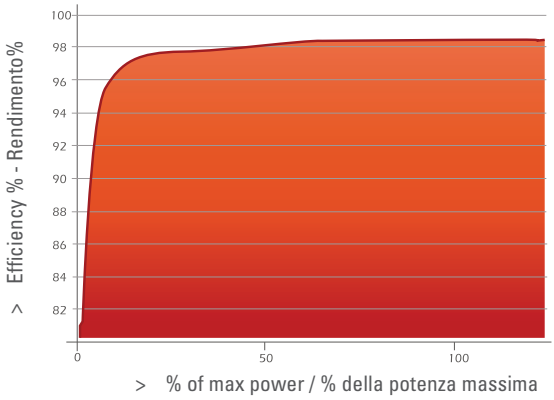
ELIMINATION OF MACHINE DOWN-TIMES

As the power architecture is divided into several modules, the inverter will never stop completely because it will only stop the failing module inside the converter. Competitors' inverters are usually made with a single power module inverter (or in case of multi-modules, often with a single magnetic filter device towards the grid), when a competitor's machine stops then the inverter will stop producing until it's repaired. Instead FIMER inverter keeps on functioning as it has multiple modules and multiple magnetic devices, even when one is damaged, the others continue to operate normally so our customer will never lose a EURO of production.

PERFORMANCE



RENDIMENTI



Gli inverter FIMER Centralizzati per allaccio alle reti elettriche di distribuzione MT sono macchine completamente innovative. La tecnologia MPS (Modular Power System), proprietaria e brevettata FIMER, consente di ottimizzare i tre principali aspetti che caratterizzano un inverter Fotovoltaico:

- PERFORMANCE
- DURATA
- ELIMINAZIONE FERMO MACCHINA

PERFORMANCE

L'inverter FIMER è un inverter modulare e, come già spiegato in precedenza, questa particolarità consiste nel fatto che lo stadio di conversione dell'inverter è formato da più moduli di potenza ad IGBT da 75kWp che lavorano in parallelo tra loro in uscita sulla rete elettrica di distribuzione CA: se prendiamo come riferimento una macchina da 1.025 kWp essa è formata da dieci moduli da 102.5 kWp, mentre una macchina da 300 kWp è realizzata con quattro moduli da 102.5 kWp, e cosi via. La modularità si estende inoltre anche ai dispositivi magnetici (induttanze), ai condensatori di conversione dell'energia e a tutte le schede ed i dispositivi elettronici di controllo e regolazione (presenti sempre uno per ciascun modulo di potenza). Questo aspetto rende la macchina FIMER, unica sul mercato. Perché? Perché mentre un qualsiasi inverter ad esempio da 1.025 kWp della concorrenza ha solitamente bisogno per la magnetizzazione dei dispositivi dei circuiti di potenza (es. le induttanze, il filtro di linea, i condensatori lato rete, ecc.) di circa 10% della potenza nominale, che corrisponde in questo caso a circa 102.5 kWp, la macchina FIMER deve magnetizzare sempre e solo un modulo da 102.5 kWp alla volta che nel nostro caso corrisponde ad un consumo di energia magnetizzante pari a 0,8 kWp, consumo che viene applicato ai soli moduli che in quel momento la macchina sta accendendo e facendo lavorare. Tutto questo si traduce nel fatto che la macchina FIMER produce circa l'11% in più di qualsiasi altro produttore al mondo grazie a questa caratteristica unica. Questo significa che installando un inverter FIMER, esso si ripaga quasi interamente già nei primi anni di funzionamento dell'impianto e di copertura della garanzia base del prodotto.

DURATA

Un inverter FIMER dura di più! Per durare di più l'elettronica ha bisogno di lavorare a basse temperature. I moduli di potenza degli inverter FIMER si accendono e si spengono in maniera sequenziale in modo da rimanere sempre freddi (ovvero operano in condizioni di temperature di lavoro basse e sempre controllate) quindi sono destinati a durare di più nel tempo. Oltretutto, in questo modo, viene anche ottimizzato l'utilizzo delle ventole di raffreddamento che, girando meno e per meno tempo, assorbono e dissipano meno energia garantendo quindi alla macchina dei valori di rendimento e di redditività più elevati.

ELIMINAZIONE DEL FERMO MACCHINA

Avendo un'architettura di potenza suddivisa in più moduli, la macchina non si fermerà mai completamente poiché si arresterà solo il modulo malfunzionante presento entro il convertitore. Le macchine della concorrenza sono solitamente realizzate con un solo modulo inverter di potenza (o se multi modulo, spesso con un solo dispositivo magnetico di filtro verso la rete); quando si ferma una macchina della concorrenza allora l'inverter non produce più nulla fino a quando esso non viene riparato. L'inverter FIMER invece, avendo più moduli e più dispositivi magnetici, anche nel caso in cui uno di questi si guasti, gli altri continuano a funzionare regolarmente non facendo perdere "un euro" di produzione al cliente.

R5515 TL
I35.532.050

R6615 TL
I36.632.050

OUTPUT VOLTAGE

400 V_{AC}

MPPT VOLTAGE RANGE

675 - 1.320V_{DC}

Advantage

> High efficiency, up to 99%.
> Modular inverter (MPS system).

> Elevato rendimento, quasi 99%.
> Modularità dell'inverter (MPS system).

Features

> Use of a single magnetic component each module.
> Advance modularity (according to IPCCM algorithm).
> Continual monitoring of the system and integrated datalogger.
> Outbound communication.
> Monitoring of the photovoltaic plant.

> Impiego di un singolo componente magnetico per ciascun modulo.
> Modulazione all'avanguardia (secondo l'algoritmo IPCCM).
> Supervisione continua del sistema e datalogger integrato.
> Comunicazione verso il mondo esterno.
> Monitoraggio dell'impianto fotovoltaico.

Accessories

> See accessories pag. 41
> Vedi accessori pag. 41

IP 20

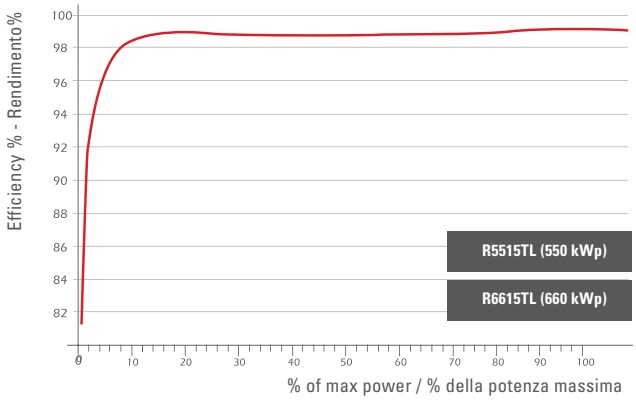
LVFRT

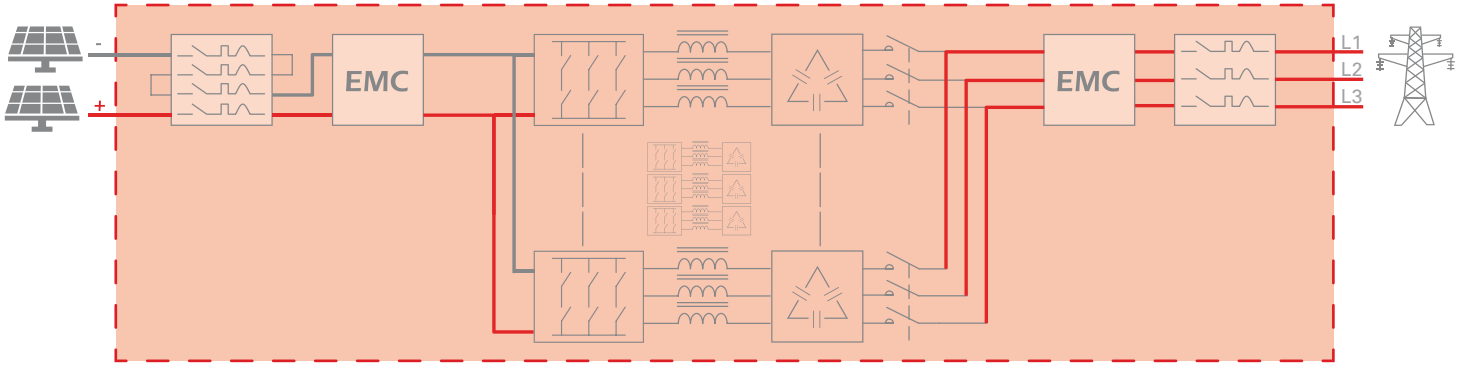
OVER FREQ. P REDUCTION

SEMICIRCULAR CAPABILITY

Q=f(V)

COSφ=f(P)

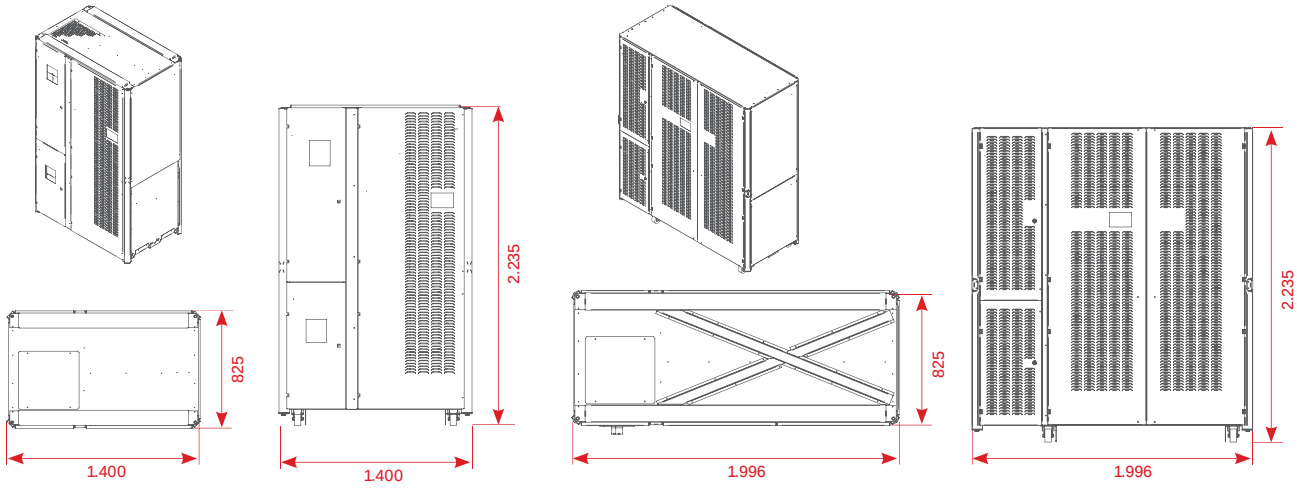




MV Central Inverter

Note: Block diagram refers to the converter R5515TL
Lo schema a blocchi si riferisce al convertitore R5515TL

R5515 TL
R6615 TL



DC Input - PV Module

	R5515TL	R6615TL
Nr Modules	**5**	**6**
MPPT voltage range(V_{DC})	675 - 1.320 V	675 - 1.320 V
Max no-load PV voltage (V_{OC})	**1.500 V**	**1.500 V**
DC-voltage ripple (%)	3%	3%
Maximum input current (A_{DC})	800 A	960 A
DC control mode	Rapid and efficient MPPT control	Rapid and efficient MPPT control
Number of MPPT	1	1
Number of input max in parallel	2 (Opt. 4)	2 (Opt. 4)
Reverse polarity protection	•	•
DC input connection	Integrated DC Switch	Integrated DC Switch
Overvoltage protection	SPD surge arrestors	SPD surge arrestors
Overvoltage Category	II	II

AC Output grid

Nominal power (kVA)* (Note1)	513 kVA	615 kVA
Max current (A_{AC}) *(Note1)	741 A	889 A
Max unbalance current	< 2%	< 2%
AC output Voltage (V_{AC})	400V_{RMS} ±10%	400V_{RMS} ±10%
Nr Phase	3-phase (L1-L2-L3-PE)	3-phase (L1-L2-L3-PE)
Frequency (Hz)	50/60 Hz	50/60 Hz
Aux. power supply (V_{AC} - I_{AC})	230V ±10% - 10A (L-N)	230V ±10% - 10A (L-N)
Auxiliary control supply	230V ±10% - 10A (L-N)	230V ±10% - 10A (L-N)
Distortion factor (THD)	< 3%	< 3%
Galvanic insulation	No (transformerless)	No (transformerless)
AC input connection	Magnetothermic AC grid switch	Magnetothermic AC grid switch

General Data

Maximum efficiency	98.80%	98.80%
European efficiency	98.30%	98.30%
Static MPPT efficiency	> 99.9 %	> 99.9 %
Dynamic MPPT efficiency	> 99.8 %	> 99.8 %
Night consumption (W)	< 60 W	< 60 W
Modulation	By using the IPCCM algorithm	By using the IPCCM algorithm
Weight (kg)	1.300 kg	1.330 kg
Protection degree	IP20	IP20
Cooling	By using fans speed controlled by temperature	By using fans speed controlled by temperature
Dimensions (DxWxH mm)	1.400x825x2.235 mm	1.996x825x2.235 mm
Noise level (dBA)	< 70 dBA	< 70 dBA
Operating temperature (°C)	-10° C +50° C	-10° C +50° C
Storage temperature (°C)	-20° C +60° C	-20° C +60° C
Humidity Not condensing	0 ÷ 95%	0 ÷ 95%
Height above the sea (without derating) *(Note 2)	1.000 m	1.000 m
Air Flow	2.425 m³/h	2.910 m³/h
Protection class	I	I
Colour	RAL 9006	RAL 9006

"Note1. Power factor (cosφ)= 1 / Fattore di potenza (cosφ)= 1"
"Note2. Above 1000m derate the power of 1% pr 100m up to 3000m over the sea level /Riduzione di potenza pari a 1% ogni 1.000 m oltre i 1.000m e fino ai 3000 m massimo slm."

R7715 TL
I37.732.050

R8815 TL
I38.832.050

MAXIMUM EFFICIENCY

98.9 %

OUTPUT VOLTAGE

400 V_{AC}

MPPT VOLTAGE RANGE

675 - 1.320V_{DC}

IP 20

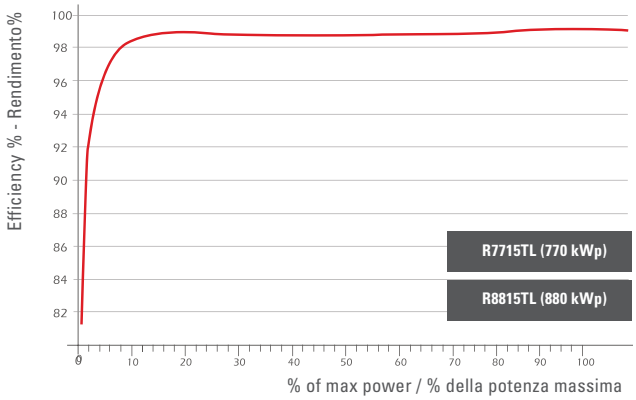
LVFRT

OVER FREQ. P REDUCTION

SEMICIRCULAR CAPABILITY

Q=f(V)

COS$_{\varphi}$=f(P)



Advantage

> High efficiency, up to 99%.
> Modular inverter (MPS system).

> Elevato rendimento, quasi 99%.
> Modularità dell'inverter (MPS system).

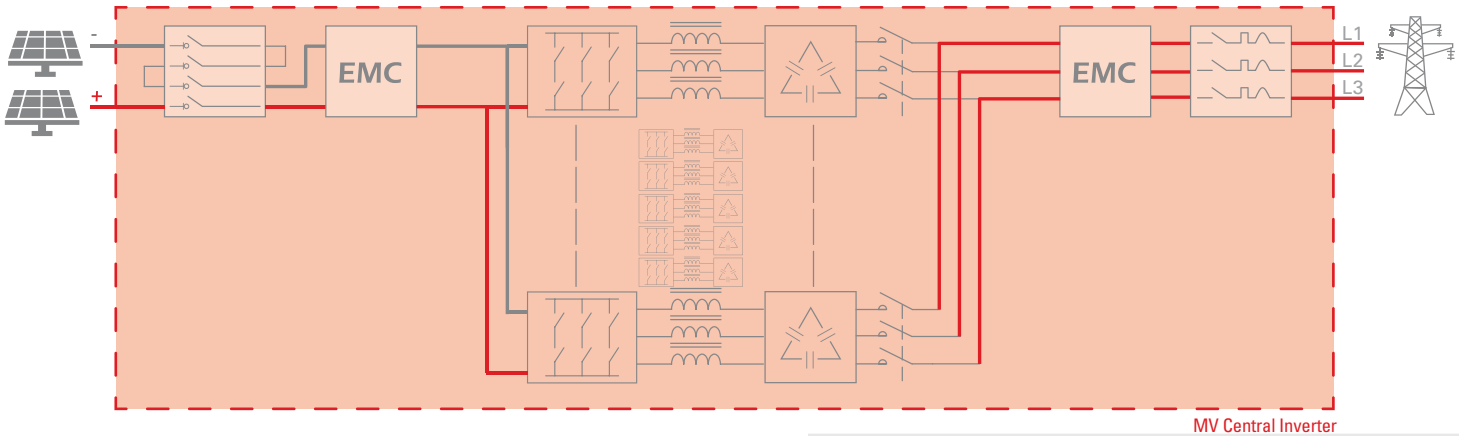
Features

> Use of a single magnetic component each module.
> Advance modularity (according to IPCCM algorithm).
> Continual monitoring of the system and integrated datalogger.
> Outbound communication.
> Monitoring of the photovoltaic plant.

> Impiego di un singolo componente magnetico per ciascun modulo.
> Modulazione all'avanguardia (secondo l'algoritmo IPCCM).
> Supervisione continua del sistema e datalogger integrato.
> Comunicazione verso il mondo esterno.
> Monitoraggio dell'impianto fotovoltaico.

Accessories

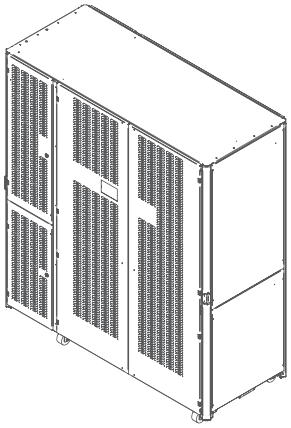
> See accessories pag. 79
> Vedi accessori pag. 79

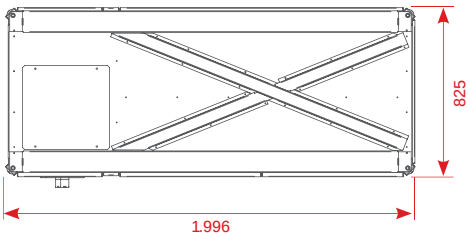


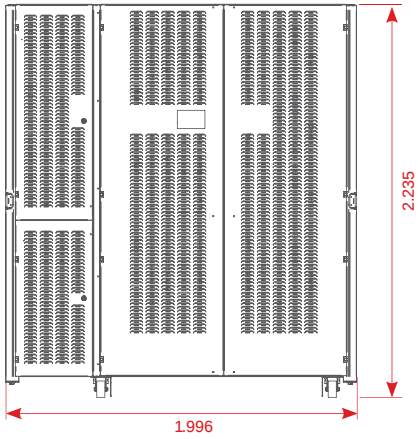
MV Central Inverter

Note: Block diagram refers to the converter R7715TL
Lo schema a blocchi si riferisce al convertitore R7715TL

R7715 TL
R8815 TL







DC Input - PV Module

	R7715TL	R8815TL
Nr Modules	**7**	**8**
MPPT voltage range(V_{DC})	675 - 1.320 V	675 - 1.320 V
Max no-load PV voltage (V_{OC})	**1.500 V**	**1.500 V**
DC-voltage ripple (%)	3%	3%
Maximum input current (A_{DC})	1.120 A	1.280 A
DC control mode	Rapid and efficient MPPT control	Rapid and efficient MPPT control
Number of MPPT	1	1
Number of input max in parallel	2 (Opt. 4)	2 (Opt. 4)
Reverse polarity protection	•	•
DC input connection	Integrated DC Switch	Integrated DC Switch
Overvoltage protection	SPD surge arrestors/	SPD surge arrestors
Overvoltage Category	II	II

AC Output grid

Nominal power (kVA)* (Note1)	718 kVA	820 kVA
Max current (A_{AC}) *(Note1)	1.037 A	1.185 A
Max unbalance current	< 2%	< 2%
AC output Voltage (V_{AC})	400V_{RMS} ±10%	400V_{RMS} ±10%
Nr Phase	3-phase (L1-L2-L3-PE)	3-phase (L1-L2-L3-PE)
Frequency (Hz)	50/60 Hz	50/60 Hz
Aux. power supply (V_{AC} - I_{AC})	230V ±10% - 10A (L-N)	230V ±10% - 10A (L-N)
Auxiliary control supply	230V ±10% - 10A (L-N)	230V ±10% - 10A (L-N)
Distortion factor (THD)	< 3%	< 3%
Galvanic insulation	No (transformerless)	No (transformerless)
AC input connection	Magnetothermic AC grid switch	Magnetothermic AC grid switch

General Data

Maximum efficiency	98.80%	98.80%
European efficiency	98.30%	98.30%
Static MPPT efficiency	> 99.9 %	> 99.9 %
Dynamic MPPT efficiency	> 99.8 %	> 99.8 %
Night consumption (W)	< 60 W	< 60 W
Modulation	By using the IPCCM algorithm	By using the IPCCM algorithm
Weight (kg)	1.400 kg	1.430 kg
Protection degree	IP20	IP20
Cooling	By using fans speed controlled by temperature	By using fans speed controlled by temperature
Dimensions (DxWxH mm)	1.996x825x2.235 mm	1.996x825x2.235 mm
Noise level (dBA)	< 70 dBA	< 70 dBA
Operating temperature (°C)	-10° C +50° C	-10° C +50° C
Storage temperature (°C)	-20° C +60° C	-20° C +60° C
Humidity Not condensing	0 ÷ 95%	0 ÷ 95%
Height above the sea (without derating) *(Note 2)	1.000 m	1.000 m
Air Flow	3.395 m³/h	3.880 m³/h
Protection class	I	I
Colour	RAL 9006	RAL 9006

"Note1. Power factor (cosφ)= 1 / Fattore di potenza (cosφ)= 1"
"Note2. Above 1000m derate the power of 1% pr 100m up to 3000m over the sea level /Riduzione di potenza pari a 1% ogni 1.000 m oltre i 1.000m e fino ai 3000 m massimo slm."

R10015 TL R11015 TL

I31.042.050 I31.142.050

MAXIMUM EFFICIENCY

98.9 %

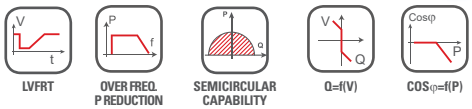
OUTPUT VOLTAGE

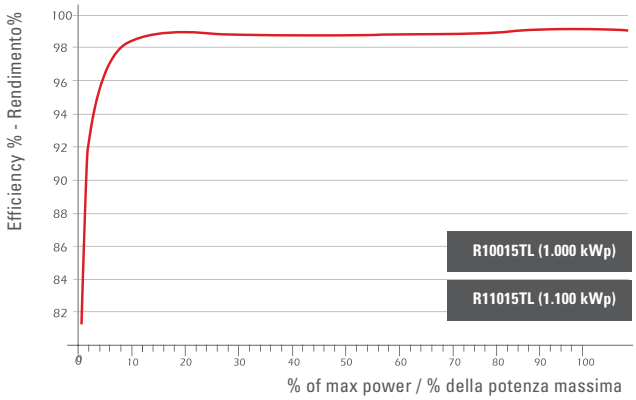
400 V_{AC}

MPPT VOLTAGE RANGE

675 - 1.320V_{DC}

IP 20





Advantage

> High efficiency, up to 99%.
> Modular inverter (MPS system).

> Elevato rendimento, quasi 99%.
> Modularità dell'inverter (MPS system).

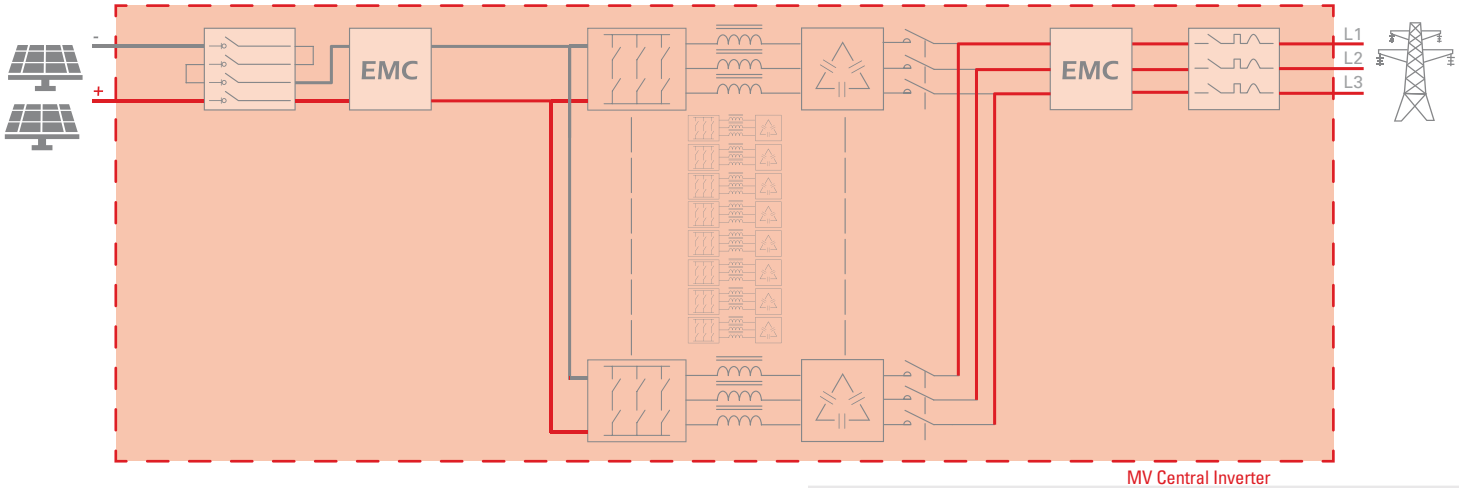
Features

> Use of a single magnetic component each module.
> Advance modularity (according to IPCCM algorithm).
> Continual monitoring of the system and integrated datalogger.
> Outbound communication.
> Monitoring of the photovoltaic plant.

> Impiego di un singolo componente magnetico per ciascun modulo.
> Modulazione all'avanguardia (secondo l'algoritmo IPCCM).
> Supervisione continua del sistema e datalogger integrato.
> Comunicazione verso il mondo esterno.
> Monitoraggio dell'impianto fotovoltaico.

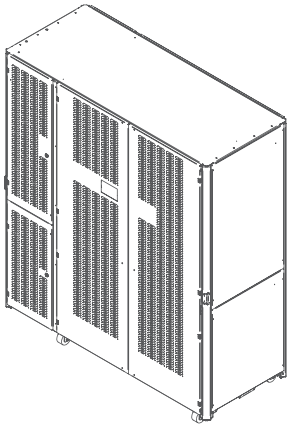
Accessories

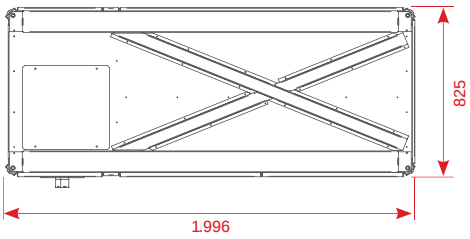
> See accessories pag. 79
> Vedi accessori pag. 79

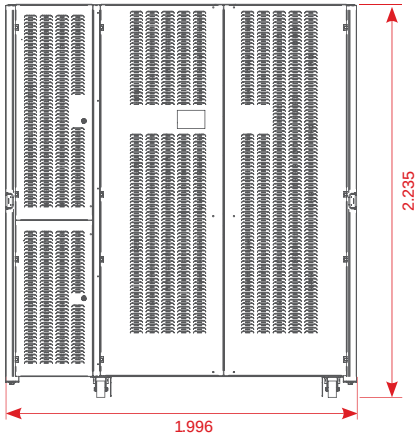


Note: Block diagram refers to the converter R11015TL
Lo schema a blocchi si riferisce al convertitore R11015TL

R10015 TL
R11015 TL







DC Input - PV Module

	R10015TL	R11015TL
Nr Modules	**9**	**10**
MPPT voltage range(V_{DC})	675 - 1.320 V	675 - 1.320 V
Max no-load PV voltage (V_{OC})	**1.500 V**	**1.500 V**
DC-voltage ripple (%)	3%	3%
Maximum input current (A_{DC})	1.440 A	1.600 A
DC control mode	Rapid and efficient MPPT control	Rapid and efficient MPPT control
Number of MPPT	1	1
Number of input max in parallel	2 (Opt. 4)	2 (Opt. 4)
Reverse polarity protection	•	•
DC input connection	Integrated DC Switch	Integrated DC Switch
Overvoltage protection	SPD surge arrestors	SPD surge arrestors
Overvoltage Category	II	II

AC Output grid

Nominal power (kVA)* (Note1)	923 kVA	1.025 kVA
Max current (A_{AC}) *(Note1)	1.333 A	1.480 A
Max unbalance current	< 2%	< 2%
AC output Voltage (V_{AC})	$400V_{RMS}$ ±10%	$400V_{RMS}$ ±10%
Nr Phase	3-phase (L1-L2-L3-PE)	3-phase (L1-L2-L3-PE)
Frequency (Hz)	50/60 Hz	50/60 Hz
Aux. power supply (V_{AC} - I_{AC})	230V ±10% - 10A (L-N)	230V ±10% - 10A (L-N)
Auxiliary control supply	230V ±10% - 10A (L-N)	230V ±10% - 10A (L-N)
Distortion factor (THD)	< 3%	< 3%
Galvanic insulation	No (transformerless)	No (transformerless)
AC input connection	Magnetothermic AC grid switch	Magnetothermic AC grid switch

General Data

Maximum efficiency	98.90%	98.90%
European efficiency	98.62%	98.62%
Static MPPT efficiency	> 99.9 %	> 99.9 %
Dynamic MPPT efficiency	> 99.8 %	> 99.8 %
Night consumption (W)	< 60 W	< 60 W
Modulation	By using the IPCCM algorithm	By using the IPCCM algorithm
Weight (kg)	1.500 kg	1.530 kg
Protection degree	IP20	IP20
Cooling	By using fans speed controlled by temperature	By using fans speed controlled by temperature
Dimensions (DxWxH mm)	1.996x825x2.235 mm	1.996x825x2.235 mm
Noise level (dBA)	< 70 dBA	< 70 dBA
Operating temperature (°C)	-10° C +50° C	-10° C +50° C
Storage temperature (°C)	-20° C +60° C	-20° C +60° C
Humidity Not condensing	0 ÷ 95%	0 ÷ 95%
Height above the sea (without derating) *(Note 2)	1.000 m	1.000 m
Air Flow	4.365 m^3/h	4.850 m^3/h
Protection class	I	I
Colour	RAL 9006	RAL 9006

"Note1. Power factor ($\cos\varphi$)= 1 / Fattore di potenza ($\cos\varphi$)= 1"
"Note2. Above 1000m derate the power of 1% pr 100m up to 3000m over the sea level /Riduzione di potenza pari a 1% ogni 1.000 m oltre i 1.000m e fino ai 3000 m massimo slm."

ACCESSORIES

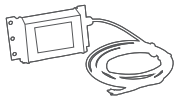
MV CENTRAL INVERTER
1.500 V

MV CENTRAL INVERTER

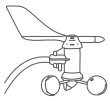
MV

Exthernal accessories - MV Central Inverter 1.500V

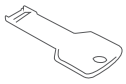
ENVIRONMENTAL SENSOR BOX (NOTE 1)

	> IA0.580.000	Temperature and irradiation sensor.

ANEMOMETER / ANEMOMETRO (NOTE 1)

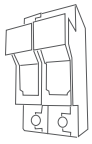
	> IA0.580.027	For measuring the intensity and direction of the wind.

FW Update USB KEY

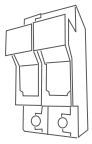
	> IA0.101.008	USB for FW updating. connection to the grid.

Accessories installed into 3ph MV central Inverter 1.500V

GROUNGING KIT DC+

	> xxx.yyy.zzz.000	Device required in case of installation of a photovoltaic generator with si-amorphus panels grounding on positive pole of solar strings.

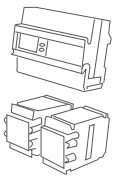
GROUNGING KIT DC-

	> xxx.yyy.zzz.001	Device required in case of installation of a photovoltaic generator with si-amorphus panels grounding on negative pole of solar strings.

SHUNT RELEASE

	> xxx.yyy.zzz.0003	Releasing coil for disconnecting the AC and DC switch in case of EPO activation (emergency push button).

ENERGY METER

	> IA0.580.052	Energy meter and current transformer probes.
	> IA0.580.056	Energy meter and current transformer probes for feed in tarif measure.

Note1. It is required the presence of the PC board called interface expansion card only for R1500TL

MS

MEGASTATION

1500V

MEGASTATION
COMPLETE SOLUTION UNITS
1.500V

The MEGASTATION are complete "turnkey" for the conversion of energy produced by large PV installation into electricity feed into the MV distribution grid. Thanks to the flexibility of the different sizes of power and the ease of connection and commissioning they provide fast installation extremely quick and rapid.

The MEGASTATION are available in four power size: 1.100-2.200-3.300-4.400 kWp (Max power DC 1.500V).
They are able to maximize the efficiency and performance of your solar park thanks to the use of central inverters FIMER R series with modular architecture of power (Modular Power System, patented by FIMER). Using the modular inverters FIMER within MEGASTATION it is allowed not only to maximize the efficiency and performance of the system, but also it reduces the downtime and the service is extremely rapid and available to restore easily the malfunction occurred to your conversion station. The Modular Power System gives therefore the absolute certainty the production of energy. Partializing the full power of each inverter, even in case of failure, your solar installation will never stop producing energy. Another power converter module will think to exploit and compensate for the production.

ADVANTAGES
- > Flexibility and scalability configuration.
- > A wide and complete range of power.
- > Manufactured and tested directly in factory to reduce installation time and avoid the assembly in plant.
- > Maximum efficiency and energy production thanks to inverter with MPS architecture.
- > Differentiated management of the photovoltaic generator and optimization in sub-field.
- > Designed in such a way as to be easily serviced periodically due to the easy accessibility of all installed devices.

Le MEGASTATION sono stazioni complete "chiavi in mano" per la conversione dell'energia FV prodotta da grandi impianti solari in energia elettrica ceduta alla rete MT del distributore. Grazie alla flessibilità delle varie taglie di potenza e alla estrema semplicità di allaccio e messa in servizio esse garantiscono tempi di installazione estremamente rapidi e veloci.

Le MEGASTATION sono disponibile in quattro taglie di potenza: 1.100-2.200-3.300-4.400 kWp (potenza massima DC 1.500V).
Esse sono in grado di massimizzare l'efficienza e il rendimento del Vostro parco solare grazie anche all'utilizzo di inverter centralizzati FIMER serie R con architettura modulare della potenza (Modular Power System, proprietaria FIMER). Utilizzare gli inverter modulari FIMER all'interno delle MEGASTATION consente non solo di massimizzare l'efficienza e il rendimento dell'impianto, ma anche di ridurre i tempi di fermo impianto e quelli di assistenza, estremamente RAPIDA e SEMPLICE, per il ripristino del malfunzionamento occorso alla Vostra stazione di conversione di energia. Il sistema Modular Power System vi dà pertanto la assoluta certezza della produzione di energia. Parzializzando tutta la potenza di ogni singolo inverter, anche in caso di guasto, il Vostro impianto solare non smetterà mai di produrre energia. Un altro modulo di potenza penserà a sfruttare e compensare la produzione.

PECULIARITÀ
- > Flessibilità e scalabilità di configurazione.
- > Vasta e completa gamma di potenza.
- > Realizzata e collaudata direttamente in fabbrica per ridurre i tempi di installazione ed evitare l'assemblaggio in impianto.
- > Massima efficienza e produzione di energia grazie a inverter con MPS.
- > Gestione differenziata del generatore fotovoltaico e suddivisione ottimizzata in sottocampi.
- > Progettata in maniera tale da poter essere facilmente manutenuta periodicamente grazie alla facile accessibilità di tutti i dispositivi installati.

MS 1100

Up to 1.100 kVA
20 ft.

MS 2200

Up to 2.000 kVA
20 ft. ot 40 ft.

APPARENT POWER AC	MV OPERATING VOLTAGE	MPPT VOLTAGE RANGE
up to 2.000 kVA	Up to 36 kV	Up to 1.500 V_{DC}

Advantage

> Modular and scalable size of power.
> Fully waterproof and insulated to withstand over time.
> High reliability to ensure easy maintainability.
> Fixing of all devices at the native structures of the container guarantee maximum stability of the station.
> Complete range of standard equipment, with customizable request of options

> Potenza modulare e scalabile.
> Perfettamente impermeabili all'acqua e isolate termicamente per resistere nel tempo.
> Elevata affidabilità per garantire una facile manutenibilità.
> Fissaggio di tutti i dispositivi alle strutture portanti del container per garanzia di massima stabilità.
> Completo equipaggiamento di serie, personalizzabile con richiesta di opzioni.

Features

> Plug & play installation to reduce the time of built of the Pv plant.
> Very compact and extremely robust design.

> Soluzione plug&play per ridurre i tempi di realizzo impianto.
> Design molto compatto e struttura estremamente robusta.

MS 3300
Up to 3.000 kVA
40 ft.

MS 4400
Up to 4.000 kVA
40 ft.

APPARENT POWER AC	MV OPERATING VOLTAGE	MPPT VOLTAGE RANGE
up to 4.000 kVA	Up to 36 kV	Up to 1.500 V_{DC}

Advantage

> Modular and scalable size of power.
> Fully waterproof and insulated to withstand over time.
> High reliability to ensure easy maintainability.
> Fixing of all devices at the native structures of the container guarantee maximum stability of the station.
> Complete range of standard equipment, with customizable request of options

> Potenza modulare e scalabile.
> Perfettamente impermeabili all'acqua e isolate termicamente per resistere nel tempo.
> Elevata affidabilità per garantire una facile manutenibilità.
> Fissaggio di tutti i dispositivi alle strutture portanti del container per garanzia di massima stabilità.
> Completo equipaggiamento di serie, personalizzabile con richiesta di opzioni.

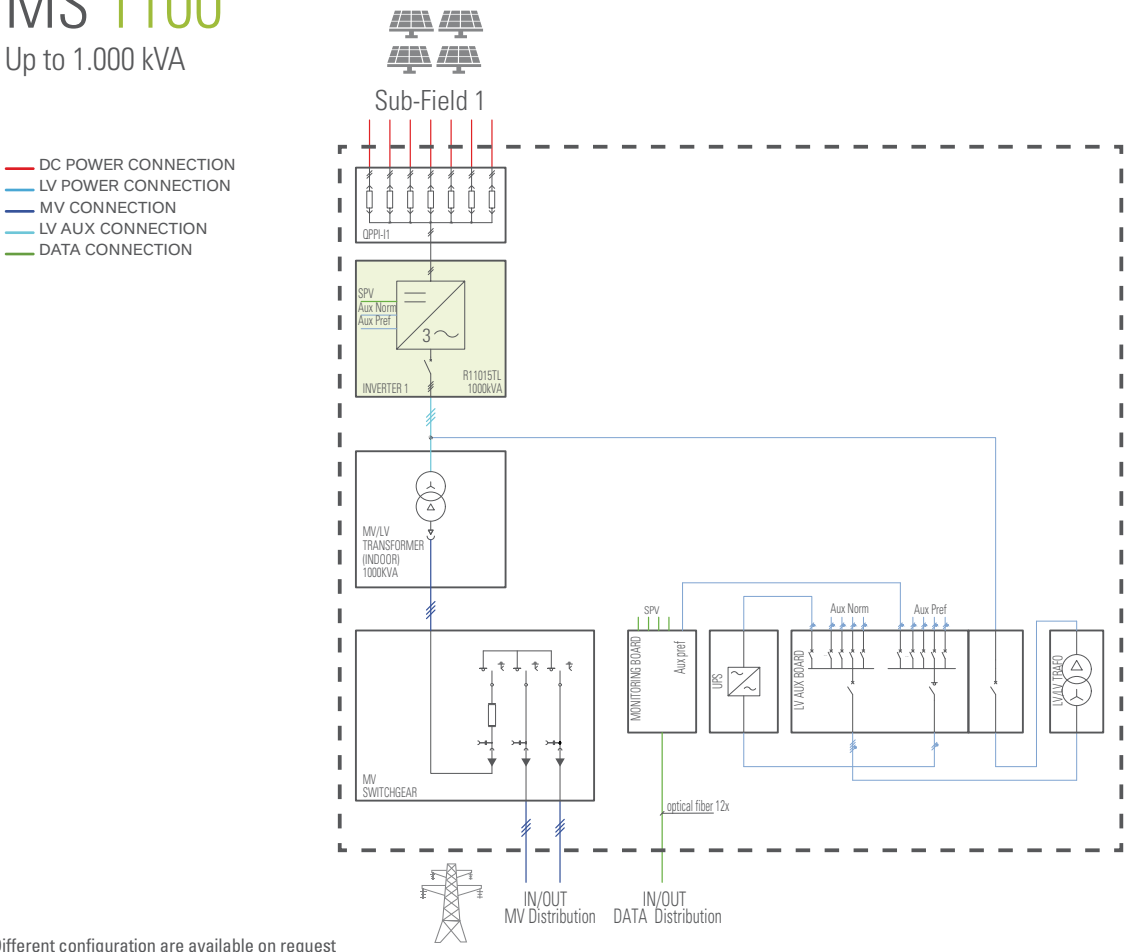
Features

> Plug & play installation to reduce the time of built of the Pv plant.
> Very compact and extremely robust design.

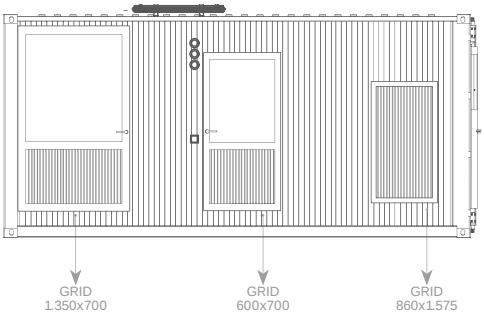
> Soluzione plug&play per ridurre i tempi di realizzo impianto.
> Design molto compatto e struttura estremamente robusta.

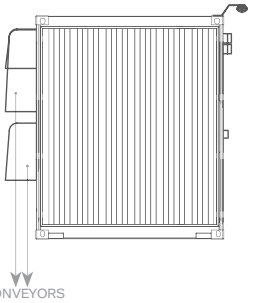
MS 1100

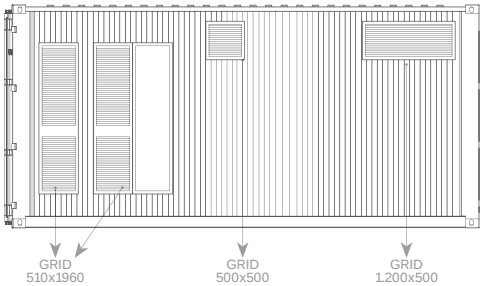
Up to 1.000 kVA

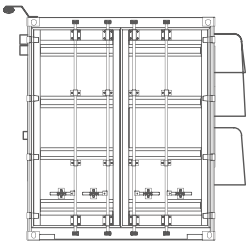


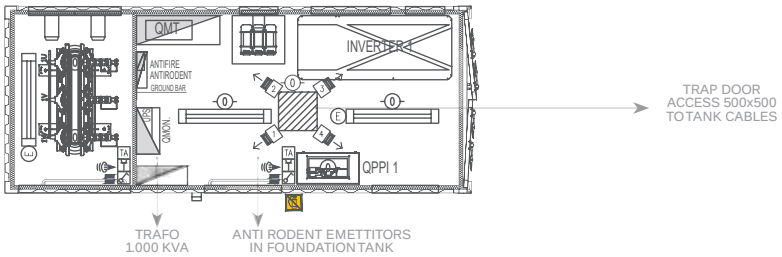
* Different configuration are available on request
* It is possible to have 40 ft.





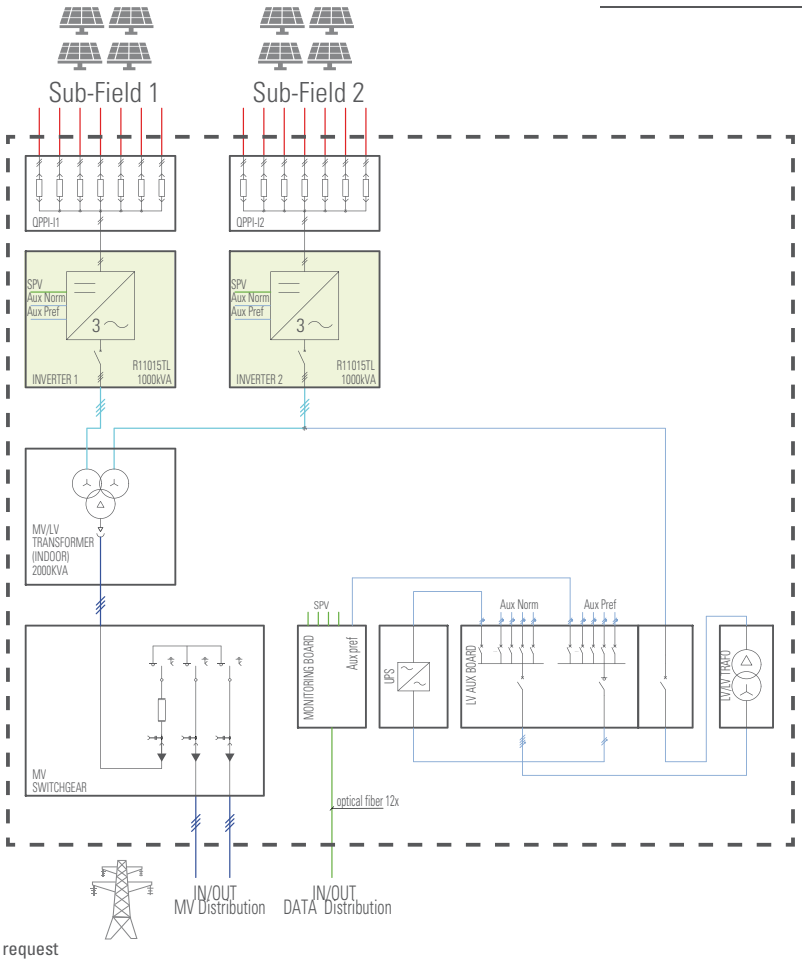




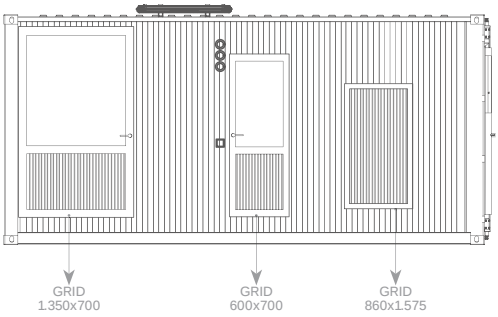


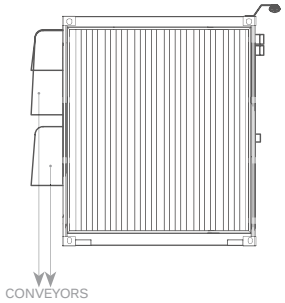
MS 2200

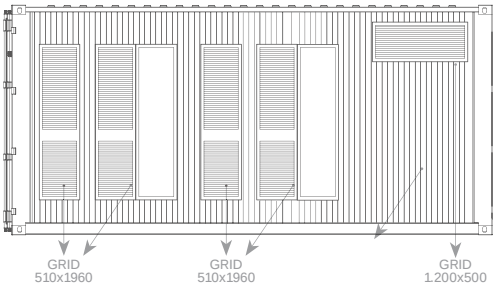
Up to 2.000 kVA

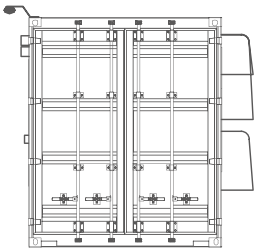


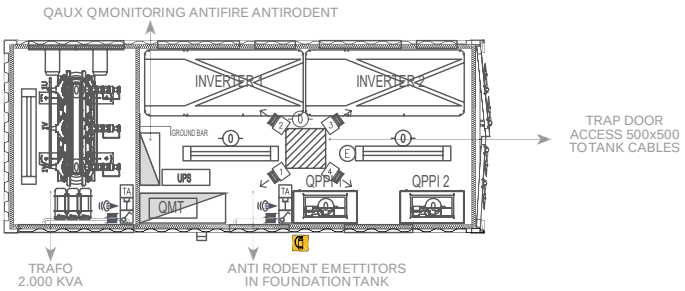
* Different configuration are available on request
* It is possible to have 40 ft.





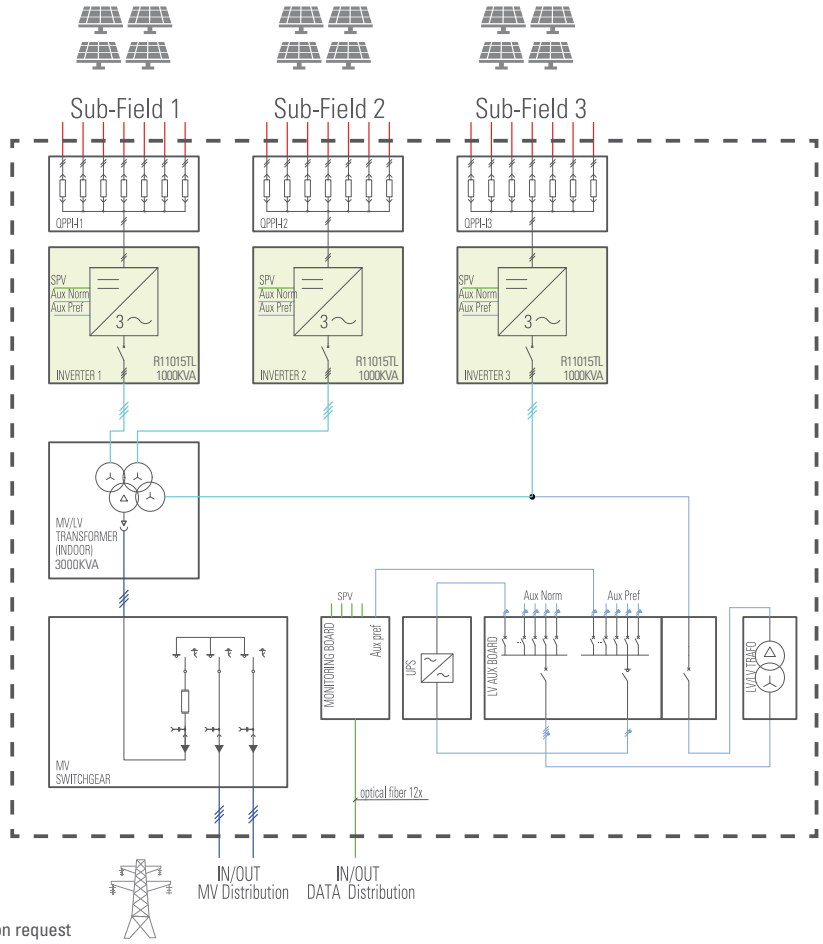




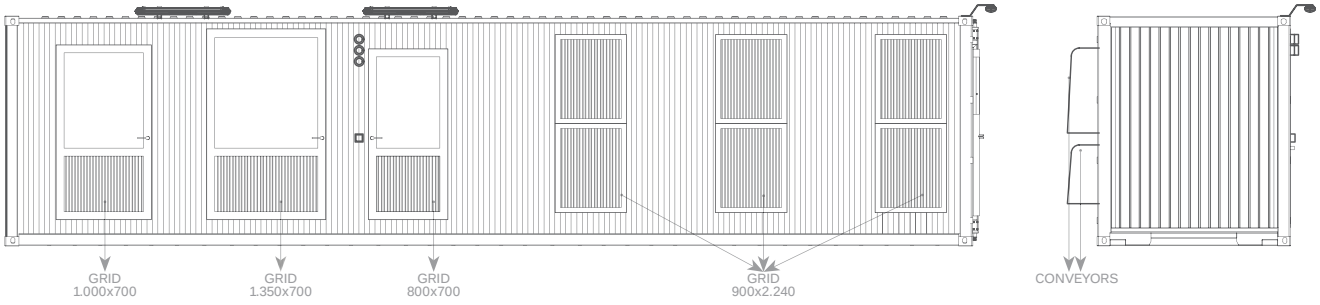


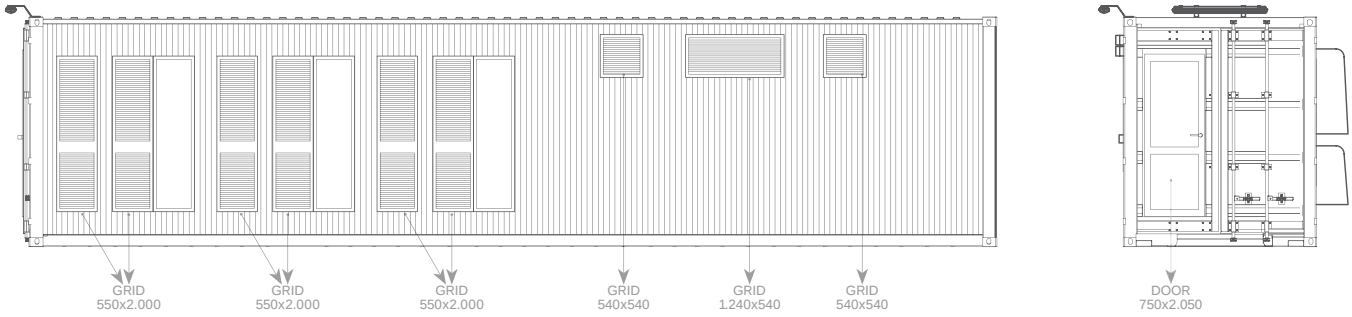
MS 3300

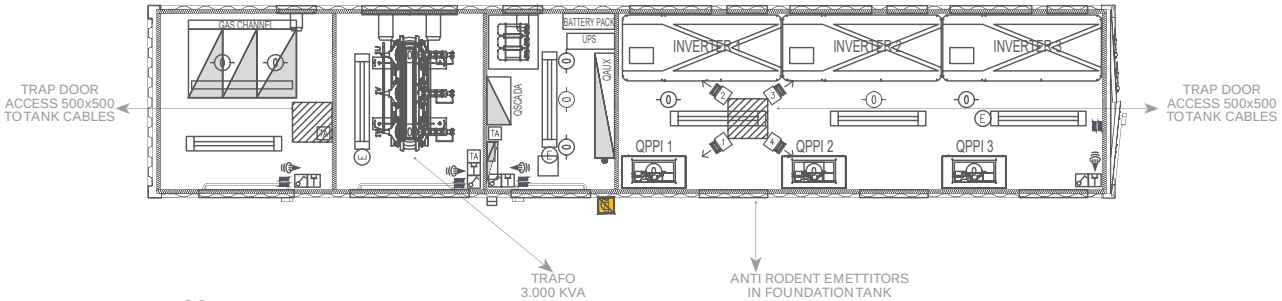
Up to 3.000 kVA



* Different configuration are available on request

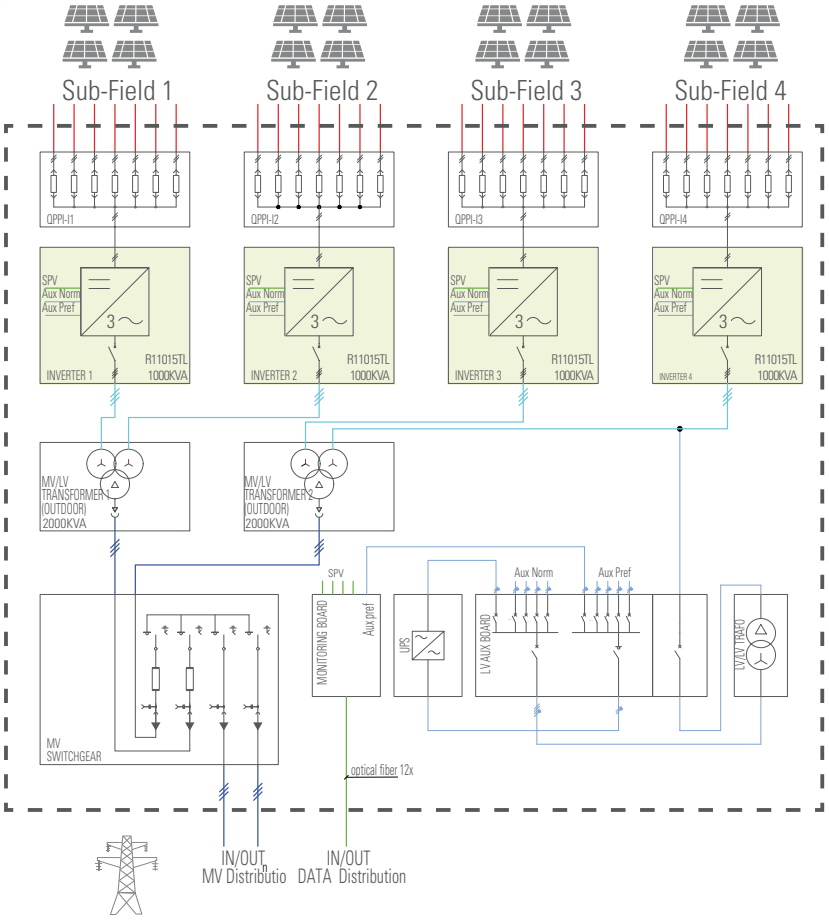




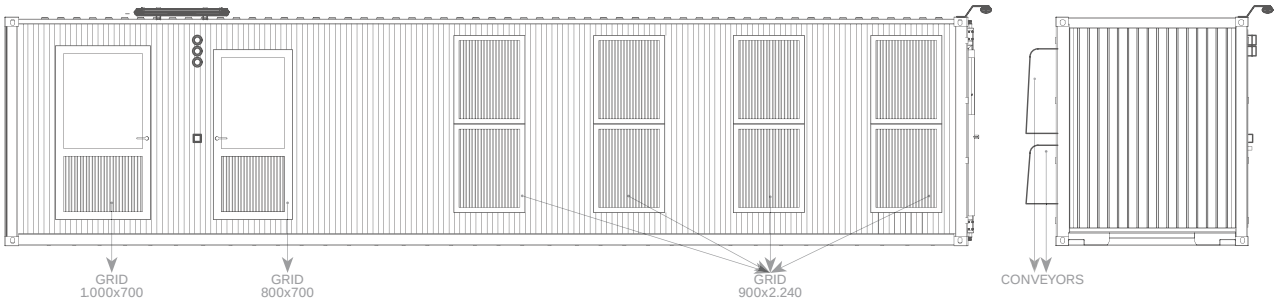


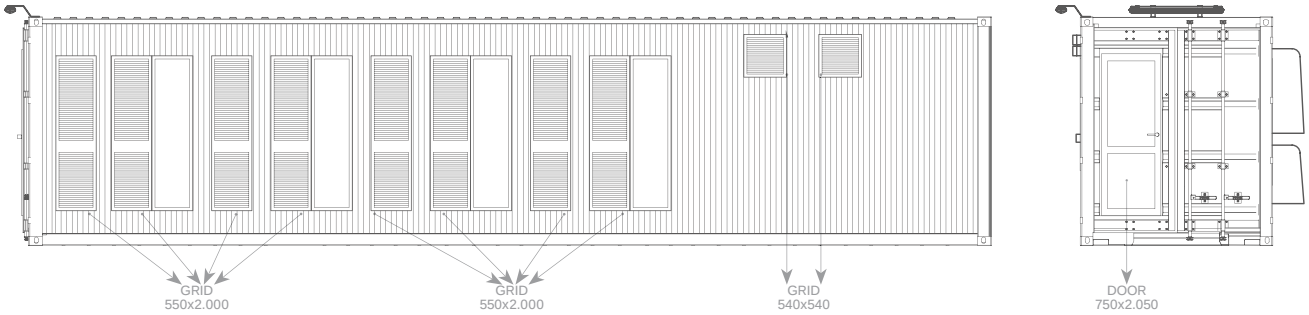
MS 4400

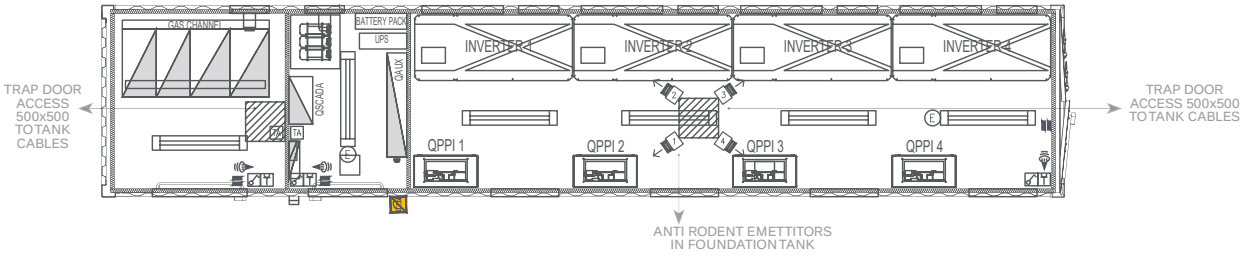
Up to 4.000 kVA



* Different configuration are available on request



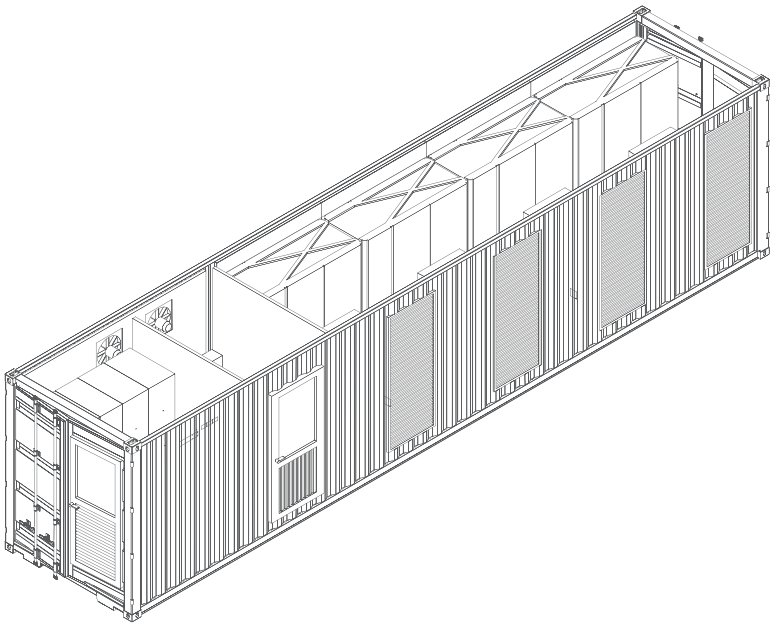




FOTOGALLERY.
CONVERSION CABIN

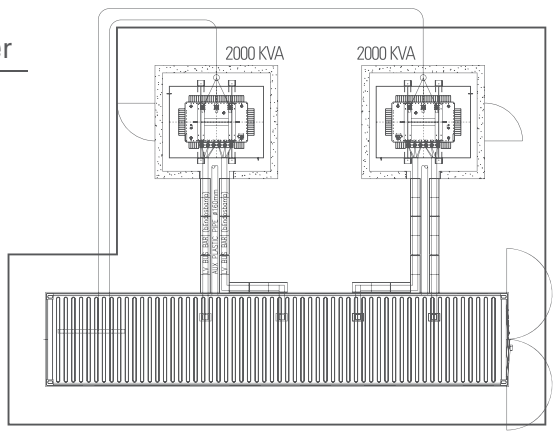
> MS 4400
> 4 Inverter R11015TL

Example MS 4400

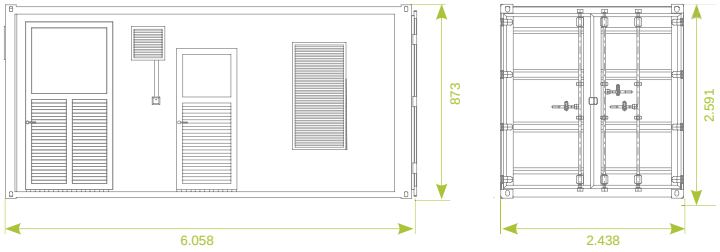


Example MS 4400 with oil transformer

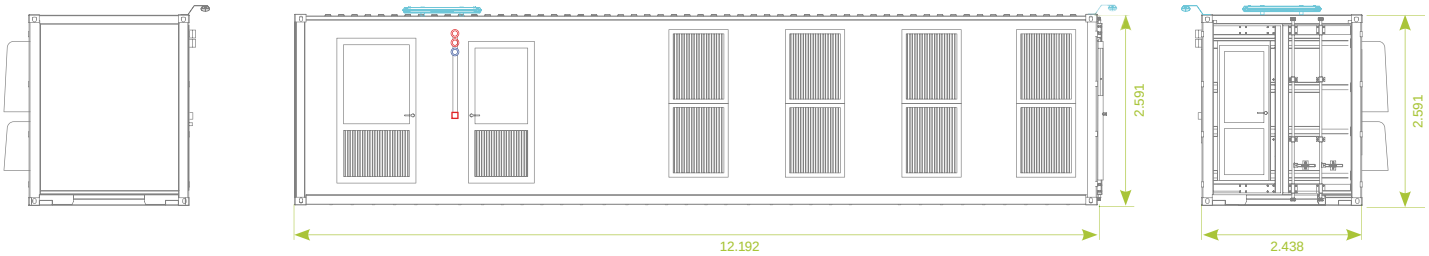
Another solution with oil transformer



MS 1100 (20ft.)
MS 2200 (20ft. or 40ft.)



MS 3300 (40ft.)
MS 4400 (40ft.)



Electrical Characteristics

		MS1100	MS2200	MS3300	MS4400
Max Voltage DC Side	V	1.500	1.500	1.500	1.500
Max Input DC Side	Nr.	7	14	21	28
Apparent Power AC Side	kVA	1'000	2'000	3'000	4'000
Max Voltage AC Side	kV	36	36	36	36

Megastation Composition

MV Switchgear		1	1	1	1
Power Transformer:					
3.000 kVA Outdoor	Nr.	-	-	1	-
2.000 kVA Ourdoor	Nr.	-	1	-	2
1.000 kVA Indoor	Nr.	1	-	-	-
Inverter:					
R11015TL	Nr.	-	-	2	4

Container

Metal Cabinet Inverter (40' HiCube)	Nr.	-	-	-	1
Metal Cabinet Inverter (20' HiCube)	Nr.	1	1	1	-

Accessories

Auxiliary Transformer		Yes	Yes	Yes	Yes
LV Board		Yes	Yes	Yes	Yes
UPS		Yes	Yes	Yes	Yes
Lighting system and sockets		Yes	Yes	Yes	Yes
Fire detection system		Yes	Yes	Yes	Yes
Monitoring Board		Yes	Yes	Yes	Yes
Lightning system and sockets		Yes	Yes	Yes	Yes
Ventilation system		Yes	Yes	Yes	Yes
Fixed power factor panel		Yes	Yes	Yes	Yes
Human presence		As option	As option	As option	As option
Door Detection		As option	As option	As option	As option
Anti-rodent protection		As option	As option	As option	As option
Environmental Sensors		As option	As option	As option	As option
Foundation		As option	As option	As option	As option

Different configuration are available on request

SBC

COMBINER BOX

1500V

COMBINER BOX

08 UP TO 24 PV STRINGS

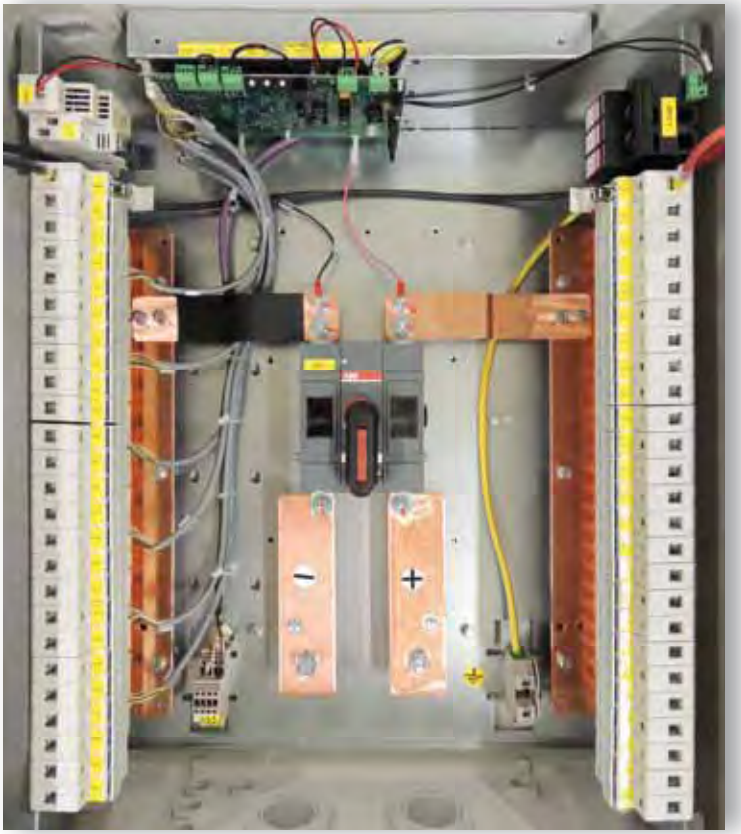
The FIMER Combiner boxes, SBC series, are intelligent control boxes (SMART) which allow the measurement of the current of each input PV string from the solar generator and allow the creation of the parallel output of all the strings of PV modules connected to them.

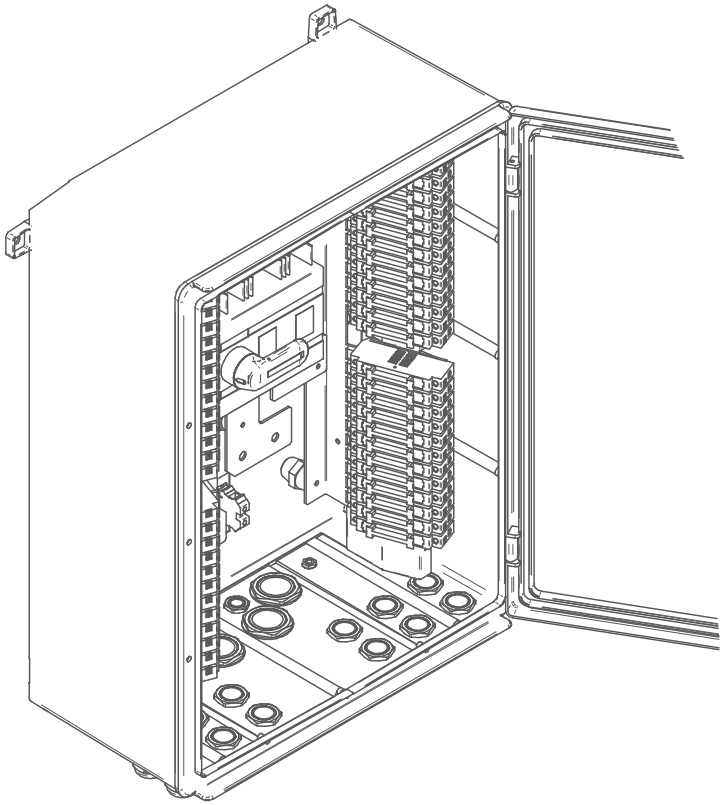
These high-performance devices implement the current measurement using Hall effect transducers and ensure an accurate localization of the malfunction of the PV field minimizing the production downtime and facilitating the timely and targeted intervention of Service. Each string box is equipped with protections against overvoltage implemented by SPD varistors, the switch in input is implemented by the fuse holders and in output by a switch; these devices allow to isolate the single sub-field PV or the individual strings from the solar generator, allowing operators to work safely. Through these advanced technology products you can also manage the complete control and monitoring of the PV field. The monitoring of the unbalance of currents (miss-matching) is built and available within the control logic of our inverters. Thanks to the string box FIMER, SBC series, is possible to control the solar installation, using the INTEGRATED Modbus RTU protocol, and in this way it's compatible with the most diffused communication systems on the market. Flexibility is first and foremost.

Gli Combiner box FIMER serie SBC, sono cassette di controllo intelligente (SMART) che consentono la misura della corrente di ogni singola stringa in ingresso dal generatore solare e permettono di realizzare in uscita il parallelo di tutte stringhe di moduli FV ad essi collegate.

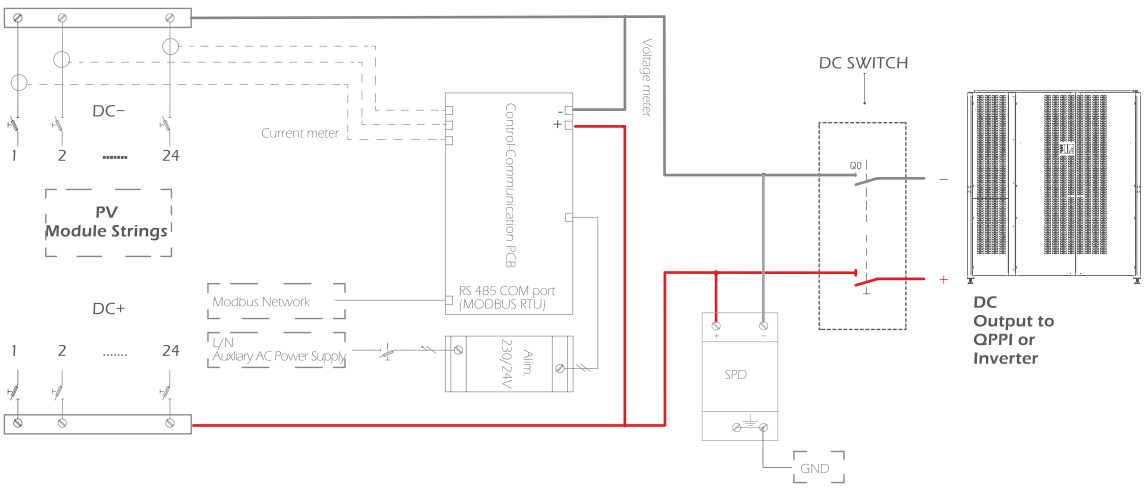
Questi prodotti, altamente performanti, implementano la misura delle correnti mediante trasduttori ad effetto Hall e favoriscono una puntuale localizzazione delle problematiche del campo FV minimizzando i tempi di mancata produzione ed agevolando l'intervento mirato e tempestivo del Service. Ogni cassetta è equipaggiata con protezioni a varistori SPD contro le sovratensioni; il sezionatore in uscita ed i portafusibili in ingresso permettono di isolare il singolo sotto-campo FV o le singole stringhe dal resto dell'impianto, consentendo agli operatori di lavorare in piena sicurezza. Grazie a questi prodotti ad avanzata tecnologia è anche possibile gestire tutti i sistemi di comunicazione del campo fotovoltaico. Il monitoraggio dello sbilanciamento delle correnti (miss-matching) è integrato e disponibile all'interno della logica di controllo dei nostri inverter. Grazie alle cassette di campo FIMER serie SBC è possibile infine dialogare, mediante il protocollo MODBUS RTU INTEGRATO, con tutti i sistemi di comunicazione presenti sul mercato. La flessibilità è prima di tutto.

COMBINER BOX



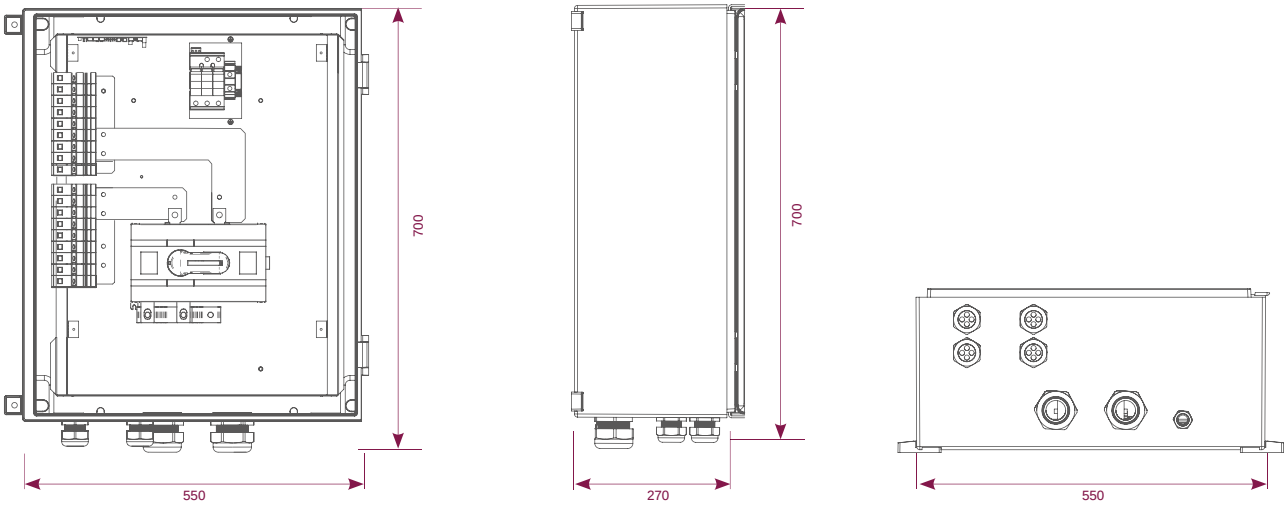


IP 20 CE



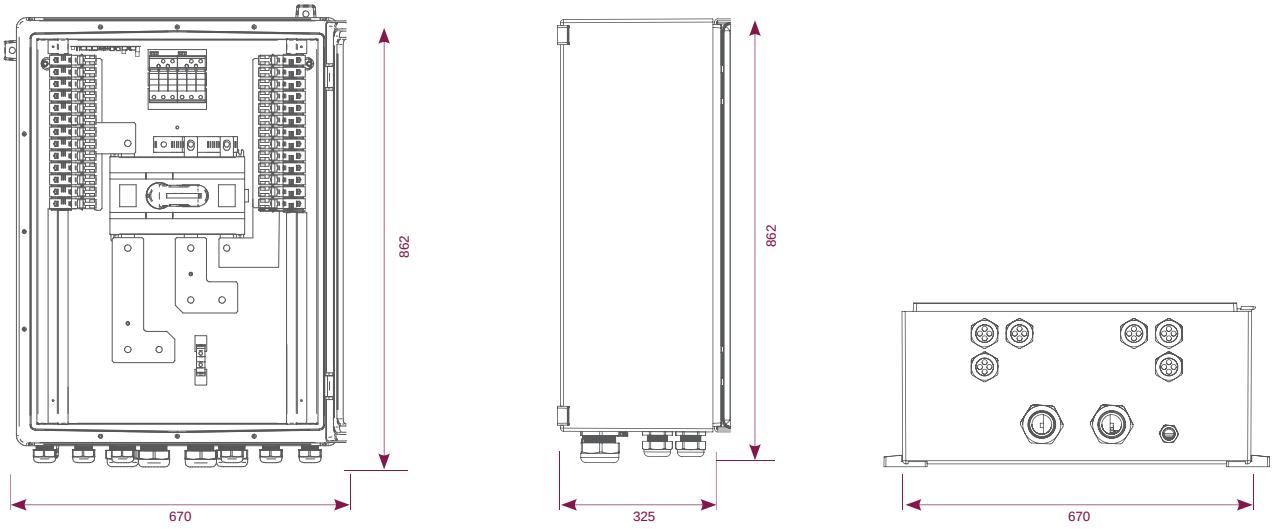
SBC 08

> Input nr 8 PV String



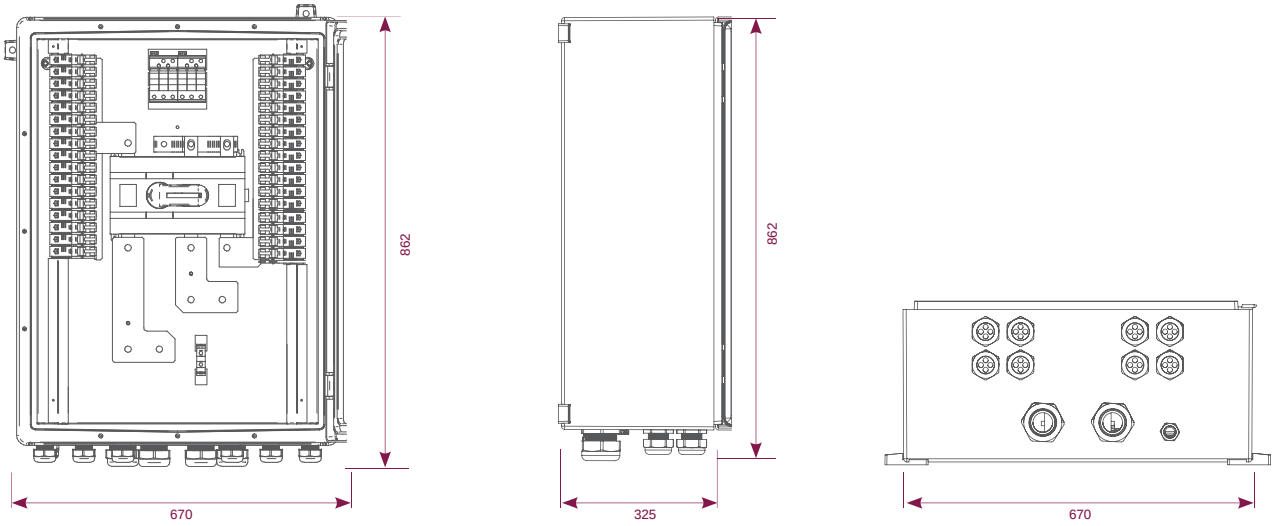
SBC 12

> Input nr 12 PV String



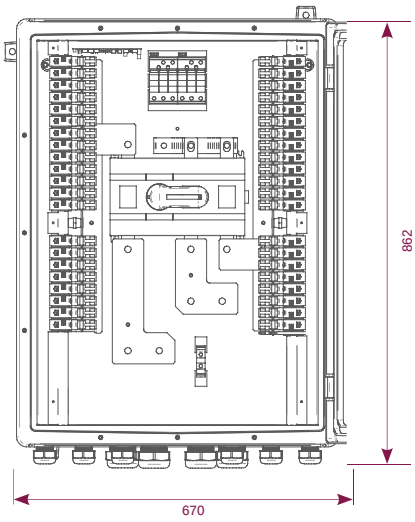
SBC 16

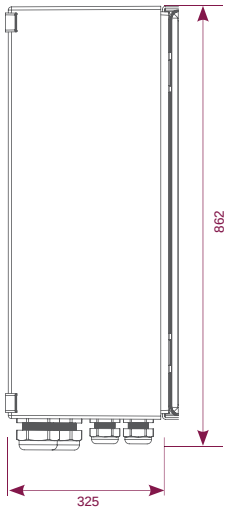
> Input nr 16 PV String

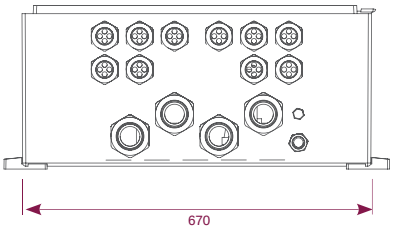


SBC 20

> Input nr 20 PV String

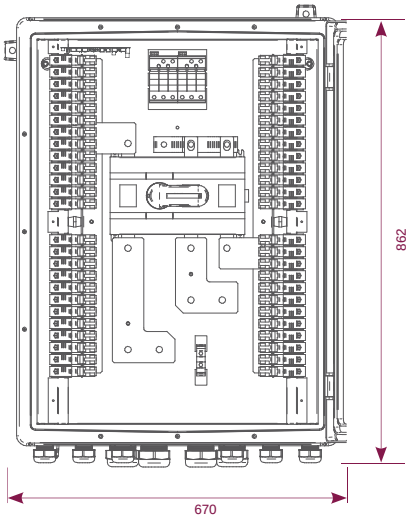


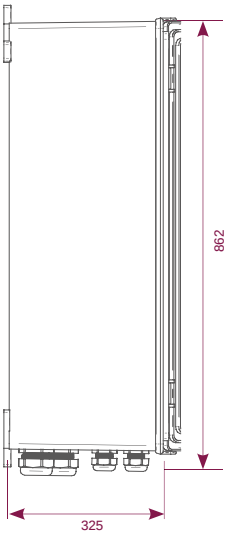


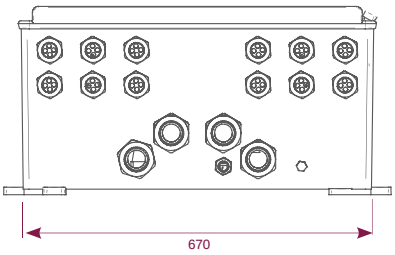


SBC 24

> Input nr 24 PV String







SBC 08 SBC 20 SBC 12 SBC 24 SBC 16

General data

Models	SBC 08	SBC 12	SBC 16	SBC 20	SBC 24
Combiner box	IA0.595.008	IA0.595.012	IA0.595.016	IA0.595.020	IA0.595.024
Combiner box with probe	IA0.596.008s	IA0.595.012s	IA0.595.016s	IA0.595.020s	IA0.595.024s
Max voltage (V_{CC})	1.500 V	1.500 V	1.500 V	1.500 V	1.500 V
N° of DC+ input	8	12	16	20	24
N° of DC- input	8	12	16	20	24
SPD protection	SPD 1.500 V_{CC} CLASS II	SPD 1.500 V_{CC} CLASS II	SPD 1.500 V_{CC} CLASS II	SPD 1.500 V_{CC} CLASS II	SPD 1.500 V_{CC} CLASS II
Electronic equipment onboard	- Monitor single string current - Monitor V_{CC} - Monitor SPD status - Monitor internal temperature	- Monitor single string current - Monitor V_{CC} - Monitor SPD status - Monitor internal temperature	- Monitor single string current - Monitor V_{CC} - Monitor SPD status - Monitor internal temperature	- Monitor single string current - Monitor V_{CC} - Monitor SPD status - Monitor internal temperature	- Monitor single string current - Monitor V_{CC} - Monitor SPD status - Monitor internal temperature
Electronic equipment for probe monitor	- Analog input 0-5V/4-20 mA - Analog input 0-10 V - RTD PT100 4 wire - Digital input dry contact	- Analog input 0-5V/4-20 mA - Analog input 0-10 V - RTD PT100 4 wire - Digital input dry contact	- Analog input 0-5V/4-20 mA - Analog input 0-10 V - RTD PT100 4 wire - Digital input dry contact	- Analog input 0-5V/4-20 mA - Analog input 0-10 V - RTD PT100 4 wire - Digital input dry contact	- Analog input 0-5V/4-20 mA - Analog input 0-10 V - RTD PT100 4 wire - Digital input dry contact
Communication protocol	MODBUS RTU	MODBUS RTU	MODBUS RTU	MODBUS RTU	MODBUS RTU

Housing

Housing	GRP (Glass fiber reinforced polyester)	GRP (Glass fiber reinforced polyester)	GRP (Glass fiber reinforced polyester)	GRP (Glass fiber reinforced polyester)	GRP (Glass fiber reinforced polyester)
Door / Opening angle / Lock	Blind /> 120° / Standard	Blind /> 120° / Standard	Blind /> 120° / Standard	Blind /> 120° / Standard	Blind /> 120° / Standard
Housing Dimensions (DxWxH mm)	550x270x700	670x325x862	670x325x862	670x325x862	670x325x862
Weight	17.6 Kg	19.5 Kg	23 Kg	24.5 Kg	25.5 Kg
External protection degree	IP65	IP65	IP65	IP65	IP65
Open door protection degreeaperta	IP20	IP20	IP20	IP20	IP20
Safety class	II	II	II	II	II
Colour	RAL 7035	RAL 7035	RAL 7035	RAL 7035	RAL 7035

Environmental data

Operating temperature	-20 / +50 C°	-20 / +50 C°	-20 / +50 C°	-20 / +50 C°	-20 / +50 C°
Storage	-25 -60	-25 -60	-25 -60	-25 -60	-25 -60
Height above the sea (Note 2)	up to 2.000 m	up to 2.000 m	up to 2.000 m	up to 2.000 m	up to 2.000 m
Humidity	0-95% (non condensing)	0-95% (non condensing)	0-95% (non condensing)	0-95% (non condensing)	0-95% (non condensing)

DC input

Input cable entry	Cable gland	Cable gland	Cable gland	Cable gland	Cable gland
Input connection	Directly on fuse holder	Directly on fuse holder	Directly on fuse holder	Directly on fuse holder	Directly on fuse holder
Conductor cross section	4 - 6 mmq	4 - 6 mmq	4 - 6 mmq	4 - 6 mmq	4 - 6 mmq
Fuse Type	10x85 - 1.500V_{CC} - gPV	10x85 - 1.500V_{CC} - gPV	10x85 - 1.500V_{CC} - gPV	10x85 - 1.500V_{CC} - gPV	10x85 - 1.500V_{CC} - gPV
Fuse size (A_{CC})	Up to 20 A	Up to 20 A	Up to 20 A	Up to 20 A	Up to 20 A
N° fuse	16	24	32	40	48
Range current sense	± 25A	± 25A	± 25A	± 25A	± 25A
Accuracy	0.5% f.s.	0.5% f.s.	0.5% f.s.	0.5% f.s.	0.5% f.s.
Current reading tipology	Hall effect	Hall effect	Hall effect	Hall effect	Hall effect

DC Output

Output cable gland	2xPG29 (*)	2xPG29 (*)	2xPG29 (*)	2xPG29 (*)	2xPG29 (*)
Clamping Area	18-25 mm	18-25 mm	18-25 mm	18-25 mm	18-25 mm
Conductor material	Copper	Copper	Copper	Copper	Copper
Terminal type	Screw M10	Screw M10	Screw M10	Screw M10	Screw M10
Voltage DC switch	1.500 V_{CC}	1.500 V_{CC}	1.500 V_{CC}	1.500 V_{CC}	1.500 V_{CC}
Current DC switch (DC-21B)	160 A (*)	160 A (*)	250 A (*)	250 A (*)	250 A (*)

(*) Contact factory for different value

Warnings: to feed the electronic devices of the string box control unit is required an auxiliary external single-phase power supply 230 VAC (L + N).
Please note that the string box doesn't contain blocking diodes.

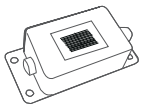
ACCESSORIES

COMBINER BOX

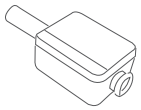
1500V

Exthernal accessories - Combiner Box 1.500V

ENVIRONMENTAL SENSOR BOX (Note1)

	> IA0.580.010	Irradiation sensor.

ANEMOMETER (Note1)

	> IA0.580.011	Environmental temperature sensor.

FW UPDATE USB KEY

	> IA0.580.013	PV module temperature sensor.

SHUNT RELEASE

	> IA0.580.019	Releasing coil that operating at minimum voltage on the output DC switch (powered at $230V_{AC}$) suitable for SBC04 - SBC08 - SBC12.
	> IA0.580.020	Releasing coil that operating at minimum voltage on the output DC switch (powered at $230V_{AC}$) suitable for SBC16 - SBC24.
	> IA0.580.024	Releasing coil that operating in current mode on the output DC switch (powered at $230V_{AC}$) suitable for SBC04 - SBC08 - SBC12.
	> IA0.580.022	Releasing coil that operating in current mode on the output DC switch (powered at $230V_{AC}$) suitable for SBC16 - SBC24.

	COVER PAGE	FIMER THE GROUP FIMER s.p.a. via J.F. Kennedy, 26 20871 Vimercate MB - ITALY

TITLE:

AVAILABLE LANGUAGE: **EN**

MV SWITCHGEAR
Technical Data Sheet

File: MV SWITCHGEAR - DATA SHEET

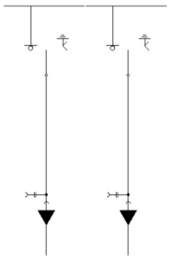
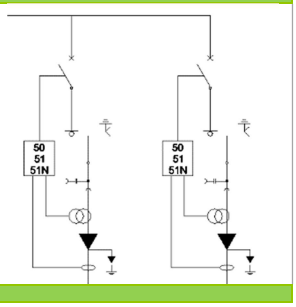
00	**20/10/17**	**EMISSION**	D.BRAMBILLA	M. AGOSTI	G.BERTINAZZO
REV.	***DATE***	***DESCRIPTION***	***PREPARED***	***CHECKED***	***APPROVED***

MV SWITCHGEAR – TECHNICAL DESCRIPTION AND DATA SHEET

Below the Medium Voltage Switchgear main specifications and the table with description for each MV type unit.

Classification (IEC62271-200)	LSC2A IAC AFLR 20kA x 1s
Degree Protection (IEC60529):	IP3X
Dimensions:	2'100x1'800x1'000
Rated Voltages	36/70/170kV
Frequency	60Hz
Operating Voltage	to be defined
Main Bars Rated Current	630A
Trafo Feeder Rated Current	630A
Rated Short Circuit Currents	20/50kA

(*) = to be confirmed

MV UNIT COMPOSITION	*SLD*
nr. 2 Out unit – 630A, equipped as follow: - nr. 3 voltage indicators - manual (motorize as option) line switch with earth position for the incoming MV cables - key lock with key free for earth switch closed - single incoming MV cable (one per phase) Out cubicle not available on the last cabin of each MV feeder	
nr. 2 Trafo Feeder units – 630A, equipped as follow: - nr. 3 voltage indicators - manual line switch with earth position for the MV cables - key lock with key free for earth switch closed - circuit breaker 36kV-20kA-630A - nr. 3 CT 100/5 - nr. 1 electronic protection relay (ANSI 50/51/51N)	

R3750TLI

PRODUCTS - MV CENTRAL INVERTER 1000V

Display touch screen da 4,3“
Elettronica di conversione
Zona di connessione lato CC, porte di comunicazione e dispositivi di protezione
Zona di connessione lato CA
Supporto per il sollevamento

- Elevato rendimento, quasi 99%.
- Modularità dell’inverter (MPS system).
- Impiego di un singolo componente magnetico per ciascun modulo.
- Modulazione all’avanguardia (secondo l’algoritmo IPCCM).
- Supervisione continua del sistema e datalogger integrato.
- Comunicazione verso il mondo esterno.
- Monitoraggio dell’impianto fotovoltaico.

MASSIMA EFFICIENZA
98.9%

OUTPUT VOLTAGE
270VAC

MPPT VOLTAGE RANGE
485 – 820 VDC

SCHEDA TECNICA R3750 TL

ACCESSORI ESTERNI MV CENTRAL

FIMER THE GROUP	*COVER*

R18615TL Inverter
Data sheet

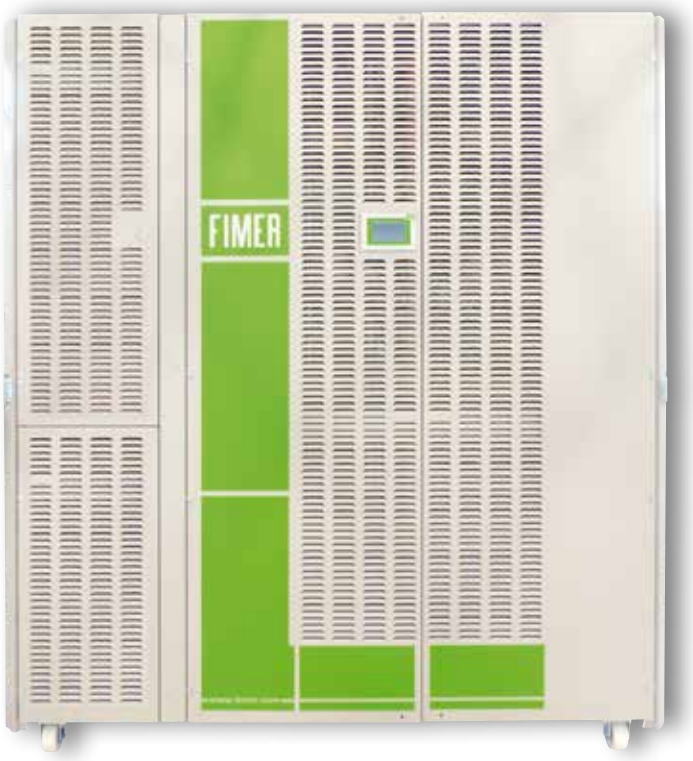
FIMER THE GROUP

INVERTER R18615TL

INVERTER R18615TL series Technical Datasheet	
DC Side	**R18615TL**
Conversion Stack	10
V_{DC}	< 1'500V
V_{MPP} range	900 – 1'320V
I_{DC}	< 2'000A
Overvoltage Protection	SPD - Class I+II
AC Side	
System	3Phases (L1-L2-L3-PE)
Nominal Power	1'550kVA up to 20°C 1'465kVA @ 45°C 1'352kVA @ 50°C
Power Capability	$0,8_{CAP}$ ... $0,8_{IND}$
Operating Voltage	570V $\pm$10%
Frequency	50/60Hz
Max Current	1'575A
Overvoltage Protection	SPD - Class II
Conversion Data	
Euro Efficiency	98,62%
Maximum Current Imbalance	< 2%
THDi	< 3%
Static Efficiency MPP	> 99,9%
Dynamics Efficiency MPP	> 99,8%
General Data	
Degree Protection inside the cabinet	IP20 (IEC60529)
Degree Protection with connections door open	IP20 (IEC60529)
Degree Protection with conversion door open	IP00 (IEC60529)
Operating Ambient Temperature	-10 ... + 55°C
Storage Temperature	-20 ... + 60°C
Humidity	< 95%
Noise Level	< 70dB
Color	RAL9006
Dimensions (DxWxH)	1'750x825x2'000
Weight	~ 1'600kg

S7515 TL
I37.036.350

S15015 TL
I31.446.350



MAXIMUM EFFICIENCY

98.9 %

OUTPUT VOLTAGE

550 V_{AC} ± 10%

MPPT VOLTAGE RANGE

850 - 1.250V_{DC}

UP TO IP31

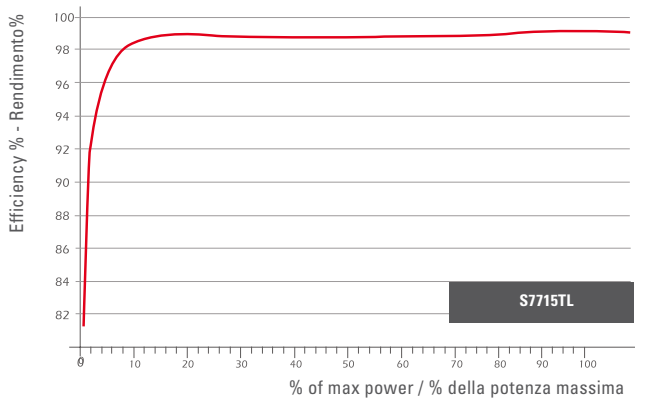
IN C.U. IP53
OPT. IP54

LVFRT

OVER FREQ. P REDUCTION

CIRCULAR CAPABILITY

Q=f(V)



Advantage

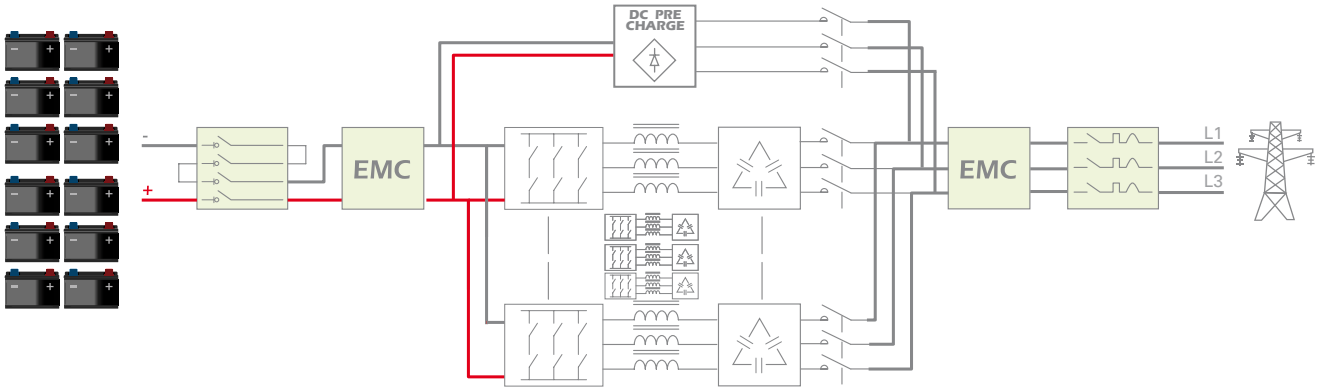
> High eff ciency, up to 99%.
> Modular inverter (MPS system).
> Elimination of machine down-times.
> Easy maintenance.
> Large lifetime.

> Elevato rendimento fino al 99%.
> Inverter modulari (sistema MPS).
> Eliminazione dei fermi macchina.
> Facilità nelle operatività di manutenzione.
> Lunga durata dei componenti.

Features

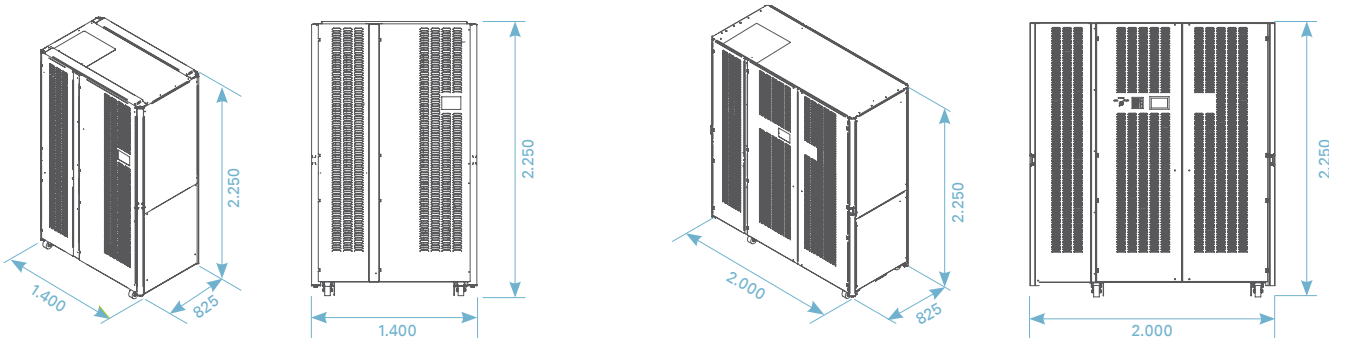
> Use of a single magnetic component each module.
> Advance modularity (according to IPCCM algorithm).
> Continual monitoring of the system and integrated datalogger.
> Outbound communication.

> Impiego di un singolo componente magnetico per ciascun modulo.
> Modularità all'avanguardia (secondo l'algoritmo IPCCM).
> Supervisione continua del sistema e datalogger integrato.
> Comunicazione verso il mondo esterno.



Note: Block diagram refers to the converter S7715TL
Lo schema a blocchi si riferisce al convertitore S7715TL

R7515 TL
R15015 TL



DC Input - PV Module

Model	S7515 TL	S15015 TL
Battery voltage Range (V_{DC})	850 – 1.250	850 – 1.250
Battery type	Li-ion, Lead, Ni-Cd, $NaNiCl_2$	Li-ion, Lead, Ni-Cd, $NaNiCl_2$
Absolute Maximum Voltage (V_{DC})	**1.500 V**	**1.500 V**
Maximum input current (A_{DC})	1.250 A	1.600 A
Voltage Ripple	<2%	<2%
Number of input max in parallel	4	4
Overvoltage Protection	SPD varistor device Class II (optional Class I+II)	SPD varistor device Class II (optional Class I+II)
DC input connection	DC Switch under load	DC Switch under load
Reverse Polarity Protection	Yes	Yes

AC Output grid

Max Power (kW) (Note1)	**705 kW**	**1.410 kW**
Max Apparent Power (kVA)	705 kVA	1.410 kVA
Max Current (A_{AC})	740 A	1.480 A
Max unbalance Current	< 2%	< 2%
Nominal Voltage (V_{AC})	**550_{RMS} ±10%**	**550_{RMS} ±10%**
Frequency (Hz)	50 / 60	50 / 60
Nr Phase	3 (L1 – L2 – L3 – PE)	3 (L1 – L2 – L3 – PE)
Aux Supply (Normal Line) (V_{AC} - I_{AC})	230Vac – 16A – 50/60Hz (L-N)	230Vac – 16A – 50/60Hz (L-N)
Aux Supply (Preferential Line) (V_{AC} - I_{AC})	230Vac – 10A – 50/60Hz (L-N)	230Vac – 10A – 50/60Hz (L-N)
Distortion factor (THDi) (Note 2)	<3%	<3%
Power Factor (Note 3)	From 0 to 1 inductive or capacitive	From 0 to 1 inductive or capacitive
Galvanic insulation	No (Transformerless)	No (Transformerless)
AC input connection	Magneto-thermic Circuit Breaker (MCCB)	Magneto-thermic Circuit Breaker (MCCB)

General Data

Max Efficiency	**98,9%**	**98,9%**
European Efficiency	98,6%	98,6%
Night consumption (W)	<60	<60
Weight (kg)	1.100	1600
Protection degree	IP20 (Opt. IP31)	IP20 (Opt. IP31)
Cooling	Air forced cooling fan speed controlled	Air forced cooling fan speed controlled
Air Flow	2.400 m^3/h	4.800 m^3/h
Maximum power dissipated in overload condition	12,5 kW - 10.705 Kcal/h	24,9 kW - 21.410 Kcal/h
Noise level (dBA)	70 dBA	70 dBA
Dimensions (H x L x P)	2250 x 1400 x 825	2.250 x 2.000 x 825
Operating temperature (°C)	- 10 ÷ +53	- 10 ÷ +53
Storage temperature (°C)	- 20 ÷ +60	- 20 ÷ +60
Humidity (Not condensing) (%)	0 ÷ 95	0 ÷ 95
Height above the sea without derating (Note 4)	1.500 m	1.500 m
Overvoltage Category	II	II
Color	RAL 9006	RAL 9006

Note 1: Valid at P.F.=1and Vac nominal
Note 2: THDi is lower than 3% for inverter power greater than 25%.
Note 3: P-Q capability is circular.
Note 4: Above 1.500 m derate the Maximum Operating Temperature of 0.4 °C per 100 m up to 3.000 m a.s.l.

Note: Each inverter must be connected separately to its own LV/MV transformer or it has to be connected to a separate LV secondary input of the LV/MV transformer. Two or more inverters cannot be connected in parallel to the same LV secondary input of the LV/MV transformer.