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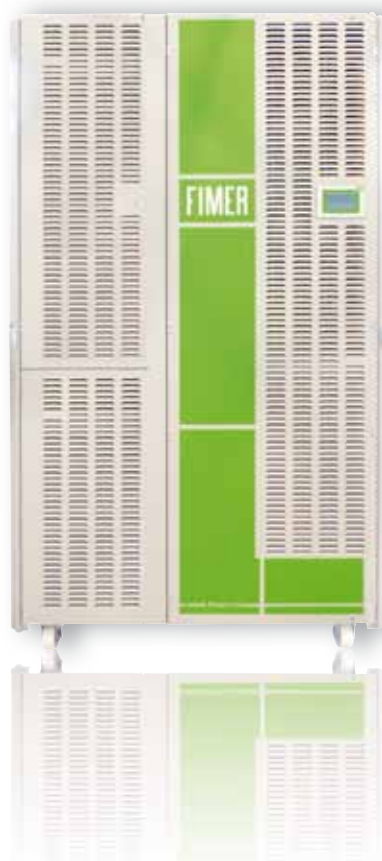
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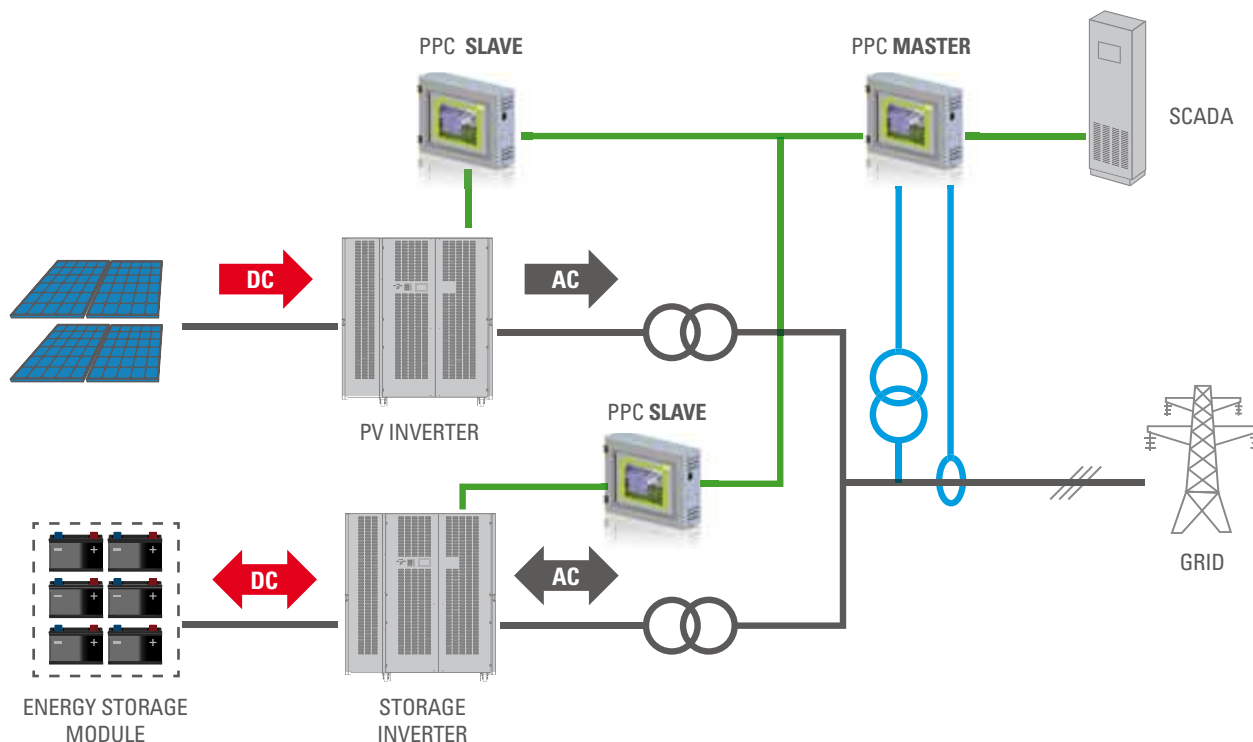
INVERTER FOR LIFE

# MV CENTRALIZED STORAGE INVERTER

## TRANSFORMERLESS BIDIRECTIONAL INVERTERS FOR STORAGE SOLUTIONS



MAX DC VOLTAGE	MODEL	MAX APPARENT POWER kVA	MAXIMUM EFFICIENCY	OUTPUT AC VOLTAGE	BATTERY VOLTAGE RANGE
1.100 V	S3750 TL - S7500 TL	345 - 690	98,9 %	270 V <sub>AC</sub>	485 - 1.000 V <sub>DC</sub>
	S4500TL - S9000 TL	416 - 833		330 V <sub>AC</sub>	610 - 1.000 V <sub>DC</sub>
1.500 V	S5515 TL - S11015 TL	512 - 1.025		400 V <sub>AC</sub>	675 - 1.250 V <sub>DC</sub>
	S7515 TL - S15015 TL	705 - 1.410		550 V <sub>AC</sub>	850 - 1.250 V <sub>DC</sub>



**The FIMER transformerless MV CENTRALIZED STORAGE INVERTER is a bidirectional three phase inverter specifically designed for implement storage solution in large-scale PV plant and MV connected installation.**

## FUNCTIONING MODE

FIMER bidirectional MV CENTRALIZED STORAGE INVERTER are available to:

- converter the DC energy stored into the battery pack and feed into the electric grid the AC energy obtained;
- store DC energy into the batteries by rectifying the AC energy from the grid.

## TPOLOGY OF BATTERY AND CONTROL MODE

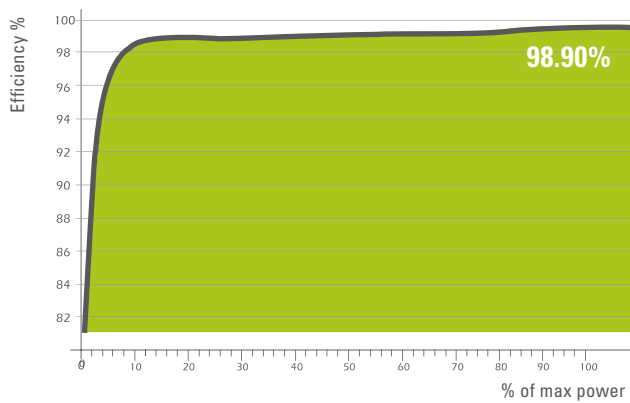
This product range of storage inverters are completely compatible with all different types of battery and storage technology included Lead Acid, Nickel – Cadmium, Litium and Sodium-Nickel- Chloride batteries.

## GRID BENEFITS AND APPLICATIONS

The most important benefits obtained by using FIMER MV CENTRALIZED STORAGE INVERTER is to guarantee a continuous and stable power supply of the AC grid according to the status of the supply source and to ensure ancillary services.

The main applications ensured by FIMER transformerless MV CENTRALIZED STORAGE INVERTER for the distribution grid are:

- > **Load & time shifting:** availability to charge battery during the day (or when the energy price is lower) and inject the energy into the grid during the night (or when the energy cost is higher).
- > **Ramp control:** reduction of the negative impact related to the sudden and undesirable variation of production related for example to the renewable generation source.
- > **Frequency regulation:** availability to support the stability of the grid in case of under-frequency events by injecting extra power for a short period.
- > **Power quality:** availability to sustain the public grid in case of short duration events that affect the quality of the power delivered to the load.
- > **Active power management:** availability to feed active power into the grid for a short period when required for avoid temporary grid outage.
- > **Reactive grid compensation:** availability to inject reactive power during day and night in order the maintain the grid voltage.

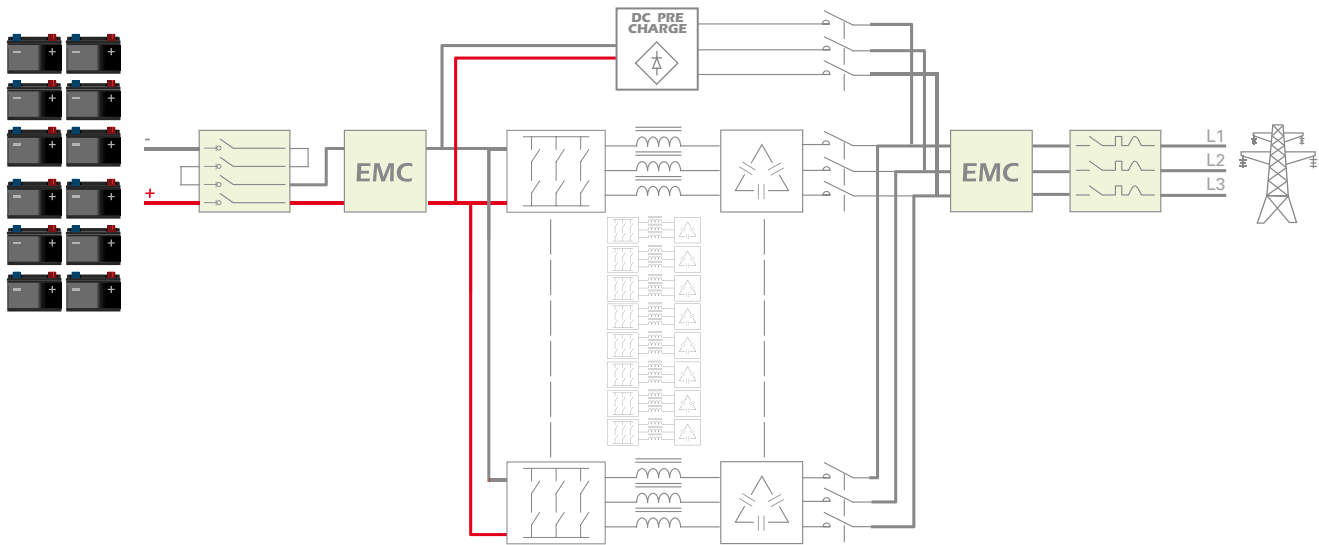


## Advantage

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

## 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.



## PROTECTION DEGREE

It indicates the classification of the degree of protection provided by mechanical enclosures and electrical boards against the intrusion of solid particles (for example parts of the body and dust) and access of liquids.



## CE MARKING

The product complies with the safety requirements of the applicable EC directives.



## LVFRT

It is the capability of the inverter to remain connected to the grid even following any poly-phase failure and whenever a voltage dip occurs, within some limits of time. The curve is completely configurable in order to meet any requirement of the grid code.



## FREQUENCY REGULATION

It is the capability of the inverter to reduce or increase the active power  $P$  for transient over-frequency or under-frequency of the grid and consequently to participate to Primary Frequency regulation at the POI. The curve is completely configurable in order to meet any requirement of the grid code.



## CIRCULAR CAPABILITY

It is the capability of the inverter to be able of generating, upon request, a certain amount of active and reactive power in whichever point of the  $P, Q$  space delimited by the circular diagram.



## GRID VOLTAGE REGULATION FUNCTION BY MEANS OF REACTIVE POWER

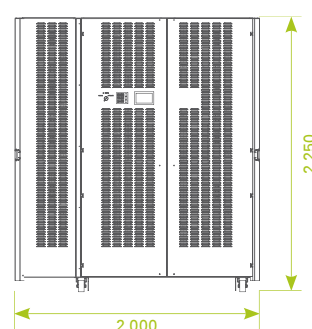
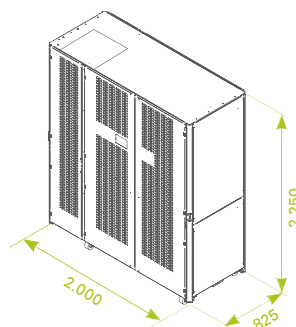
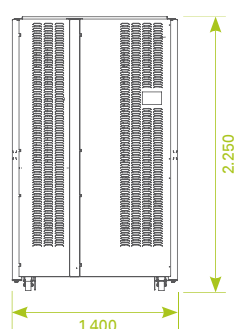
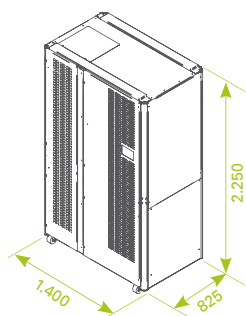
Grid voltage regulation function is carried out by appropriate generation of reactive power  $Q$  by the Inverters in local logic. The curve is completely configurable in order to meet any requirement of the grid code.

# S3750 TL

1.100Vdc - 345kVA

# S7500 TL

1.100Vdc - 690kVA



## DC Input - PV Module

Model	S3750 TL	S7500 TL
Nr. Power stack	5	10
Battery voltage Range ( $V_{DC}$ )	485 – 1.000	485 – 1.000
Battery type	Li-ion, Lead, Ni-Cd, NaNiCl <sub>2</sub>	Li-ion, Lead, Ni-Cd, NaNiCl <sub>2</sub>
Absolute Maximum Voltage ( $V_{DC}$ )	1.100	1.100
Maximum input current ( $A_{DC}$ )	800	1.600
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)	345	690
Max Apparent Power (kVA)	345	690
Max Current ( $A_{AC}$ )	740	1480
Max unbalance Current	< 2%	< 2%
Nominal Voltage ( $V_{AC}$ )	270	270
Frequency (Hz)	50 / 60	50 / 60
Nr Phase	3 (L1 – L2 – L3 – PE)	3 (L1 – L2 – L3 – PE)
Aux Supply (Normal Line)	230Vac – 16A – 50/60Hz (L-N)	230Vac – 16A – 50/60Hz (L-N)
Aux Supply (Preferential Line)	230Vac – 10A – 50/60Hz (L-N)	230Vac – 10A – 50/60Hz (L-N)
Distortion factor (THD) (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 (Transformer less)	No (Transformer less)
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	1.600
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 m³/h	4.800 m³/h
Maximum power dissipated in overload condition	12,5 kW - 10.705 Kcal/h	24,9 kW - 21.410 Kcal/h
Noise level	70dBa	70dBa
Dimensions (H x L x P)	2.250 x 1.400 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.=1 and Vac nominal

Note 2: THD is lower than 3% for inverter power greater than 25%.

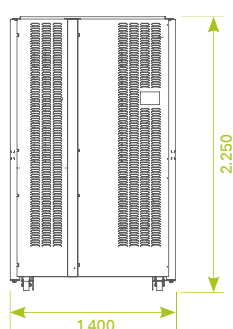
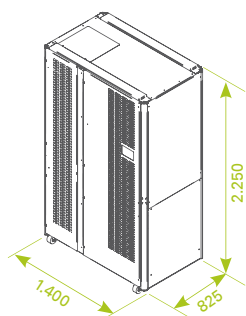
Note 3: P-Q capability is semicircular.

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 LT/MT transformer or it has to be connected to a separate LT secondary input of the LT/MT transformer. Two or more inverters cannot be connected in parallel to the same LT secondary input of the LT/MT transformer.

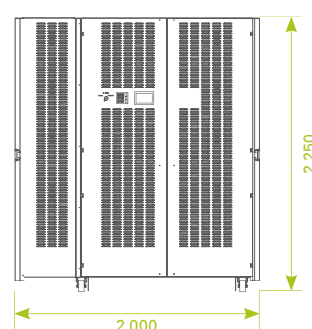
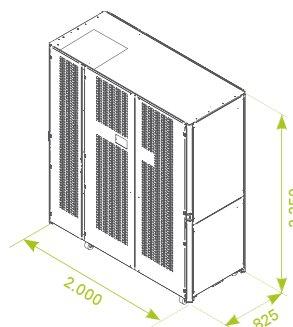
# S4500 TL

1.100Vdc - 416kVA



# S9000 TL

1.100Vdc - 833kVA



## DC Input - PV Module

Model	S4500 TL	S9000 TL
Nr. Power stack	5	10
Battery voltage Range ( $V_{DC}$ )	610 – 1.000	610 – 1.000
Battery type	Li-ion, Lead, Ni-Cd, NaNiCl <sub>2</sub>	Li-ion, Lead, Ni-Cd, NaNiCl <sub>2</sub>
Absolute Maximum Voltage ( $V_{DC}$ )	1.100	1.100
Maximum input current ( $A_{DC}$ )	800	1.600
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)	416	833
Max Apparent Power (kVA)	416	833
Max Current ( $A_{AC}$ )	730	1.460
Max unbalance Current	< 2%	< 2%
Nominal Voltage ( $V_{AC}$ )	330	330
Frequency (Hz)	50 / 60	50 / 60
Nr Phase	3 (L1 – L2 – L3 – PE)	3 (L1 – L2 – L3 – PE)
Aux Supply (Normal Line)	230Vac – 16A – 50/60Hz (L-N)	230Vac – 16A – 50/60Hz (L-N)
Aux Supply (Preferential Line)	230Vac – 10A – 50/60Hz (L-N)	230Vac – 10A – 50/60Hz (L-N)
Distortion factor (THD) (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 (Transformer less)	No (Transformer less)
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	1.600
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 m³/h	4.800 m³/h
Maximum power dissipated in overload condition	12,5 kW - 10.705 Kcal/h	24,9 kW - 21.410 Kcal/h
Noise level	70dBa	70dBa
Dimensions (H x L x P)	2.250 x 1.400 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.=1 and Vac nominal

Note 2: THD is lower than 3% for inverter power greater than 25%.

Note 3: P-Q capability is semicircular.

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.

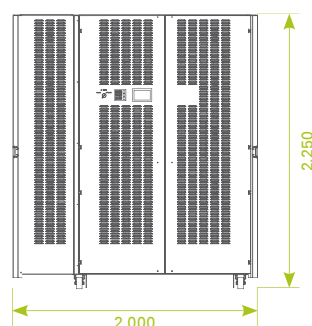
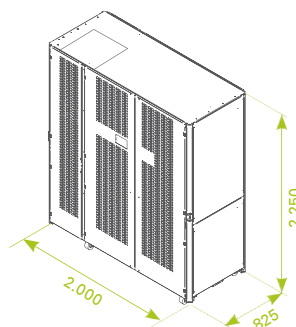
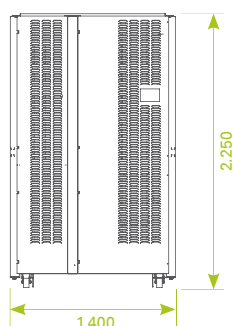
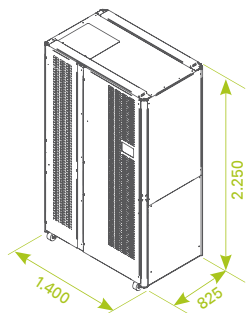
Note: Each inverter must be connected separately to its own LT/MT transformer or it has to be connected to a separate LT secondary input of the LT/MT transformer. Two or more inverters cannot be connected in parallel to the same LT secondary input of the LT/MT transformer.

# S5515 TL

1.500Vdc - 512kVA

# S11015 TL

1.500Vdc - 1.025kVA



## DC Input - PV Module

Model	S5515 TL	S11015 TL
Nr. Power stack	5	10
Battery voltage Range ( $V_{DC}$ )	675 – 1.250	675 – 1250
Battery type	Li-ion, Lead, Ni-Cd, NaNiCl <sub>2</sub>	Li-ion, Lead, Ni-Cd, NaNiCl <sub>2</sub>
Absolute Maximum Voltage ( $V_{DC}$ )	1.500	1.500
Maximum input current ( $A_{DC}$ )	1.250	1.600
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)	512	1.025
Max Apparent Power (kVA)	512	1.025
Max Current ( $A_{AC}$ )	740	1.480
Max unbalance Current	< 2%	< 2%
Nominal Voltage ( $V_{AC}$ )	400	400
Frequency (Hz)	50 / 60	50 / 60
Nr Phase	3 (L1 – L2 – L3 – PE)	3 (L1 – L2 – L3 – PE)
Aux Supply (Normal Line)	230Vac – 16A – 50/60Hz (L-N)	230Vac – 16A – 50/60Hz (L-N)
Aux Supply (Preferential Line)	230Vac – 10A – 50/60Hz (L-N)	230Vac – 10A – 50/60Hz (L-N)
Distortion factor (THD) (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 (Transformer less)	No (Transformer less)
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	1.600
Protection degree	IP20 (Opt. IP31)	IP20 (Opt. IP31)
Cooling	Air forced cooling fan speed controlled	Air forced cooling fan speed controlled
Air Flow	2400 m³/h	4.800 m³/h
Maximum power dissipated in overload condition	12,5 kW - 10.705 Kcal/h	24,9 kW - 21.410 Kcal/h
Noise level	70dBa	70dBa
Dimensions (H x L x P)	2.250 x 1.400 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.=1 and Vac nominal

Note 2: THD is lower than 3% for inverter power greater than 25%.

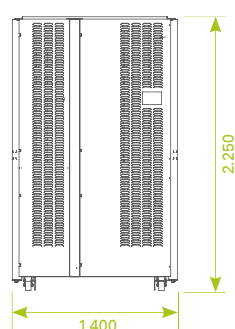
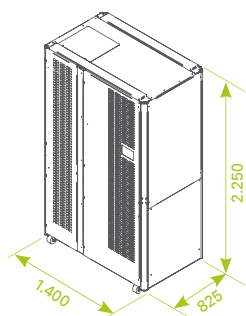
Note 3: P-Q capability is semicircular.

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 LT/MT transformer or it has to be connected to a separate LT secondary input of the LT/MT transformer. Two or more inverters cannot be connected in parallel to the same LT secondary input of the LT/MT transformer.

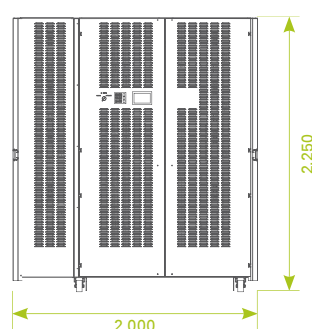
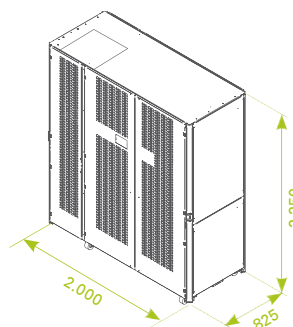
# S7515 TL

1.500Vdc - 705kVA



# S15015 TL

1.500Vdc - 1.410kVA



## DC Input - PV Module

Model	S7515 TL	S15015 TL
Nr. Power stack	5	10
Battery voltage Range ( $V_{dc}$ )	850 – 1.250	850 – 1.250
Battery type	Li-ion, Lead, Ni-Cd, NaNiCl <sub>2</sub>	Li-ion, Lead, Ni-Cd, NaNiCl <sub>2</sub>
Absolute Maximum Voltage ( $V_{dc}$ )	1.500	1.500
Maximum input current ( $A_{dc}$ )	1.250	1.600
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	1.410
Max Apparent Power (kVA)	705	1.410
Max Current ( $A_{ac}$ )	740	1.480
Max unbalance Current	< 2%	< 2%
Nominal Voltage ( $V_{ac}$ )	550	550
Frequency (Hz)	50 / 60	50 / 60
Nr Phase	3 (L1 – L2 – L3 – PE)	3 (L1 – L2 – L3 – PE)
Aux Supply (Normal Line)	230Vac – 16A – 50/60Hz (L-N)	230Vac – 16A – 50/60Hz (L-N)
Aux Supply (Preferential Line)	230Vac – 10A – 50/60Hz (L-N)	230Vac – 10A – 50/60Hz (L-N)
Distortion factor (THD) (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 (Transformer less)	No (Transformer less)
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 m³/h	4.800 m³/h
Maximum power dissipated in overload condition	12,5 kW - 10.705 Kcal/h	24,9 kW - 21.410 Kcal/h
Noise level	70dBa	70dBa
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.=1 and Vac nominal

Note 2: THD is lower than 3% for inverter power greater than 25%.

Note 3: P-Q capability is semicircular.

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.

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**FIMER S.p.A.**

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