

HYBRID INVERTERS

HITD

Hybrid Inverters for Distributed Micro-Grid Applications and Rural Electrification

Description



In order to attend the growing demand for Rural Electrification and Distributed Generation based on Hybridising renewable and fossil power sources, Zigor has developed a range of Hybrid Inverters for medium and high power solutions, covering from 30 KVA to 1800 KVA and based on two different topologies: HITC (for small mini-grid and centralised systems) and HITD for those installations where it is more suitable to distribute the Generations Resources along the micro-grid. The Hybrid Inverter Range HITD has been specially designed to build distributed hybrid micro-grid, allowing sharing the electricity generation from several different sources based on renewable as well as other generating or storage sources.

The Hybrid Inverter Range HITD can also be connected to Fuel Generators so that avoids any blackout in the micro-grid in case the renewable generation cannot cover the load demand. The Hybrid Inverter Range HITD is also capable to be connected to existing distribution grid. In these cases, the HITD Inverters will manage the energy flow between the micro-grid and the Distribution Grid. This functionality makes possible the energy return to the Distribution Grid when the generation exceeds the consumption as well as to work autonomously even if the Distribution Grid is not available.



HITD 300 KW

Features

- > Hybrid System that allows the integration of different generation sources along the micro-grid, assuring the stability of the micro-grid either connected or isolated from a Distribution Grid
- > Nominal Power from 150 KVA to 1800 KVA (based on inverter modules of 150 KVA)
- > Compatible with the existing protection Systems already installed
- > Maximum strength of the system
- > Compatible with other emergency generation Systems, like Generation Sets.
- > Allows the micro-grid Management through TCP/IP
- > Digital Management System DSP
- > Capable of managing batteries of high capacity for big autonomies

> The HITD Hybrid Inverters consists of the following five basic systems:

- Generation System (Hybrid Inverter HITD)
- Energy Storage System (Battery)
- Regulation and Control System (CONTROL V/F)
- Monitoring and Management System (SCADA)
- Bypass system

* Additionally, the Hybrid Inverter HITD architecture allows the integration of PV Solar, Wind and Battery Generation Systems from Zigor: SUNZET, BATGEN, WINDZET.

on-grid solar plants

mid voltage solar plants

hybrid generation

energy saving

telecom back up

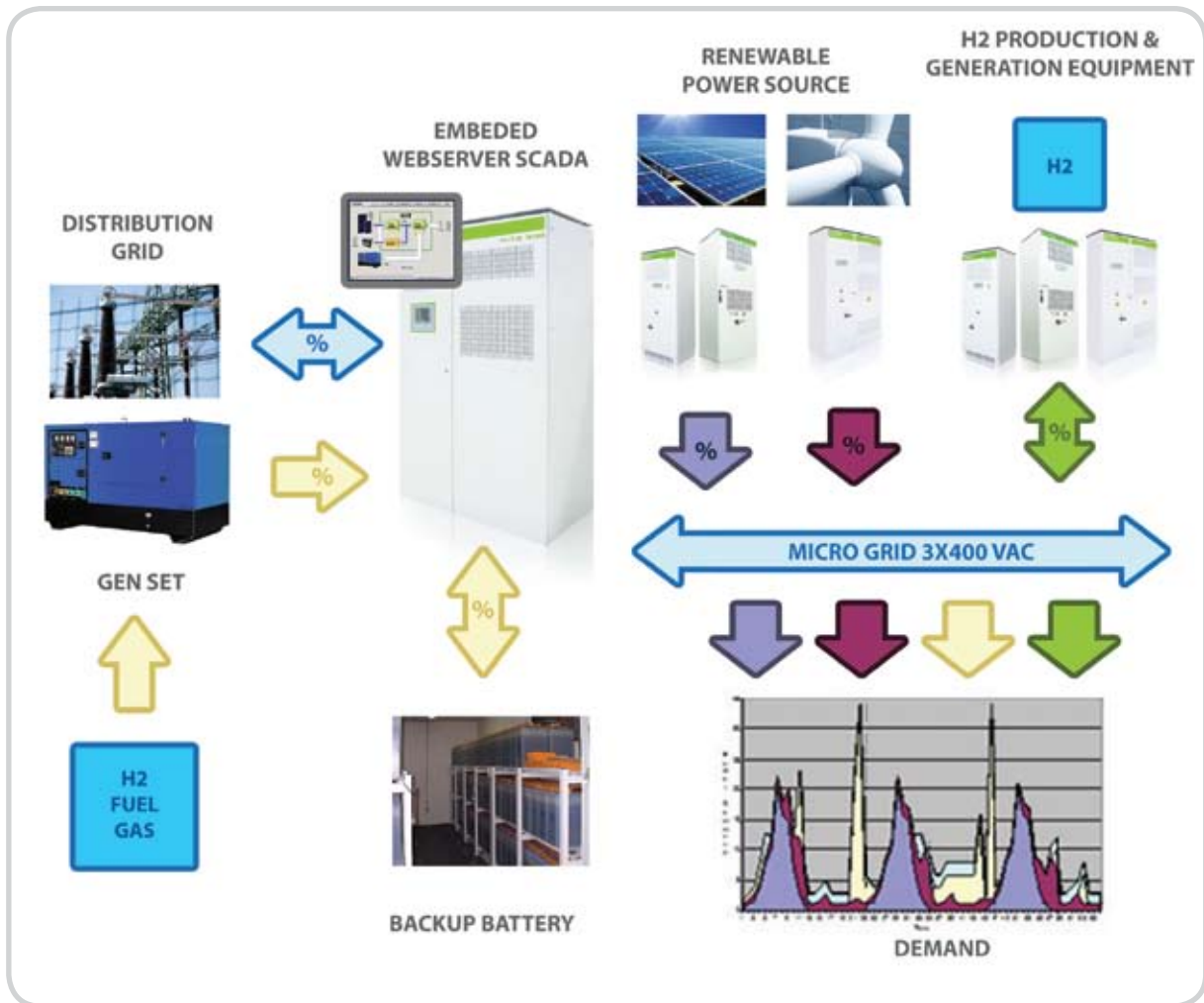
wind energy



NON - STOP POWER



> HITD architecture graph



> The HITD Architecture admits the following operation modes, always assuring the energy demand of the load:

MONG: On-grid mode: micro-grid connected to a Distribution Grid

- +R: Integrated Renewable Generation Sources
- +FH2: Integrated Generation Systems
- +ADM: Active Management of generation/demand

MOFG: OFF-grid mode: micro-grid isolated from Distribution Grid

- +R: Integrated Renewable Generation Sources
- +FH2: Integrated Generation Systems
- +ADM: Active Management of generation/demand

MNET: Hybrid Mode: bidirectional energy flow between Distribution Grid and Micro-grid

- +R: Integrated Renewable Generation Sources
- +FH2: Integrated Generation Systems
- +ADM: Active Management of generation/demand

> General specifications HITD systems

HITD CABINET					
Model	HITD 150KW	HITD 300KW	HITD 450KW	HITD 600KW	HITD 750KW
AC OUTPUT					
Nominal power	150KW (150KVA)	300KW (300KVA)	450KW (450KVA)	600KW (600KVA)	750KW (750KVA)
Overload capability (1 sec)	150%				
Nominal output voltage (400Vac)	380-400-415Vac ±10%				
Nominal output voltage (220Vac)	208-220-240Vac ±10%				
Nominal output frequency	50 / 60Hz ±1Hz				
Number of phases	3 Phases				
Maximum current per phase (400Vac)	250A	500A	750A	1000A	1250A
Maximum current per phase (220Vac)	460A	920A	1380A	1840A	2300A
Harmonic distortion	<3% at full load (2,5%) THD				
AC Overvoltage protection	Yes				
Short-circuit protection	Yes				
GE/GRID INPUT					
Minimum power AC input	200KVA	400KVA	600KVA	800KVA	1000KVA
Nominal input voltage (400Vac)	380-400-415Vac ±5%				
Nominal input voltage (220Vac)	208-220-240Vac ±5%				
Nominal input frequency	50 / 60Hz ±5Hz				
Number of phases	3 Phases				
Maximum current per phase (400Vac)	320A	640A	960A	1280A	1600A
Maximum current per phase (220Vac)	580A	1160A	1740A	2320A	2900A
GE start control	Potential free contact (230Vac/4A max.)				
Short-circuit protection	Yes				
BATTERY CONNECTION					
Nominal voltage	672Vdc				
Voltage range	575 / 800Vdc				
Maximum charge / discharge current	440A	880A	1320A	1760A	2200A
Minimum capacity of battery	100Ah	200Ah	300Ah	400Ah	500Ah
Maximum capacity of battery	4000Ah	8000Ah	12000Ah	16000Ah	20000Ah
Number of cells (Pb)	336 cells				
Protection	Short-circuit / Reverse connection / Over-discharge				
Battery charge	Yes				
GENERAL INFORMATION					
Efficiency	>96%				
Internal consumption in operation	<1% of nominal power				
Operating altitude	<1000m without power loss				
Operating ambient temperature range	0°C ~ +50°C				
Relative Humidity	0% ~ 95% Non condensing				
Cabinet dimensions (HxWxD) (cm)	215x80x60		215x160x60		
Cabinet Weight	470Kg	660Kg	850Kg	1320Kg	1510Kg
Enclosure rating	Standard - IP21				
Cooling	Forced Air				
External fan control	Potential free contact (230Vac/4A max.)				
User interface	Display 2 lines Keyboard 3 leds signaling				
Autochecking	Yes				
Log of data and events	Yes				
External interface	Ethernet – Web Server / SNMP / Modem GSM (option)				
Interface with peripheral	SNMP (Private communication)				
STANDARDS					
Certificates	CE Marking				

HITD 900KW	HITD 1050KW	HITD 1200KW	HITD 1350KW	HITD 1500KW	HITD 1650KW	HITD 1800KW
900KW (900KVA)	1050KW (1050KVA)	1200KW (1200KVA)	1350KW (1350KVA)	1500KW (1500KVA)	1650KW (1650KVA)	1800KW (1800KVA)
150%						
380-400-415Vac ±10%						
208-220-240Vac ±10%						
50 / 60Hz ±1Hz						
3 Phases						
1500A	1750A	2000A	2250A	2500A	2750A	3000A
2760A	3220A	3680A	4140A	4600A	5060A	5520A
<3% at full load (2,5%) THD						
Yes						
Yes						
1200KVA	1400KVA	1600KVA	1800KVA	2000KVA	2200KVA	2400KVA
380-400-415Vac ±5%						
208-220-240Vac ±5%						
50 / 60Hz ±5Hz						
3 Phases						
1920A	2240A	2560A	2880A	3200A	3520A	3840A
3480A	4060A	4640A	5220A	5800A	6380A	6960A
Potential free contact (230Vac/4A max.)						
Yes						
672Vdc						
575 / 800Vdc						
2640A	3080A	3520A	3960A	4400A	4840A	5280A
600Ah	700Ah	800Ah	900Ah	1000Ah	1100Ah	1200Ah
24000Ah	28000Ah	32000Ah	36000Ah	40000Ah	44000Ah	48000Ah
336 cells						
Short-circuit / Reverse connection / Over-discharge						
Yes						
>96%						
<1% of nominal power						
<1000m without power loss						
0°C ~ +50°C						
0% ~ 95% Non condensing						
215x160x60	215x240x60			215x320x60		
1700Kg	2170Kg	2360Kg	2550Kg	3020Kg	3210Kg	3400Kg
Standard - IP21						
Forced Air						
Potential free contact (230Vac/4A max.)						
Display 2 lines						
Keyboard						
3 leds signaling						
Yes						
Yes						
Ethernet – Web Server / SNMP / Modem GSM (option)						
SNMP (Private communication)						
CE Marking						

BRAKER CABINET					
Model	HITD 150KW	HITD 300KW	HITD 450KW	HITD 600KW	HITD 750KW
GENERAL INFORMATION					
Nominal Power	200KVA	300KVA	500KVA	600KVA	800KVA
Nominal output voltage (400Vac)	380-400-415Vac ±10%				
Nominal output voltage (220Vac)	208-220-240Vac ±10%				
Nominal output frequency	50 / 60Hz ±1Hz				
Number of phases	3 Phases + Neutral				
Maximum current per phase (400Vac)	335A	500A	835A	1000A	1335A
Maximum current per phase (220Vac)	610A	915A	1525A	1830A	2440A
Operating altitude	<1000m				
Operating ambient temperature range	0°C ~ +50°C				
Relative Humidity	0% ~ 95% Non condensing				
Enclosure rating	Standard - IP21				
Cooling	Forced Air				
Cabinet dimensions (HxWxD) (cm)	215x80x60	215x160x60	215x240x60		215x320x60
Cabinet Weight	590Kg	1100Kg	1690Kg	1770Kg	2360Kg
Interface with HITD	SNMP (Private communication)				

BYPASS CABINET					
Model	HITD 150KW	HITD 300KW	HITD 450KW	HITD 600KW	HITD 750KW
GENERAL INFORMATION					
Nominal Power	180KVA	360KVA	540KVA	720KVA	900KVA
Nominal output voltage (400Vac)	380-400-415Vac ±10%				
Nominal output voltage (220Vac)	208-220-240Vac ±10%				
Nominal output frequency	50 / 60Hz ±1Hz				
Number of phases	3 Phases				
Maximum current per phase (400Vac)	300A	600A	900A	1200A	1500A
Maximum current per phase (220Vac)	550A	1100A	1650A	2200A	2750A
Operating altitude	<1000m				
Operating ambient temperature range	0°C ~ +50°C				
Relative Humidity	0% ~ 95% Non condensing				
Enclosure rating	Standard - IP21				
Cooling	Forced Air				
Cabinet dimensions (HxWxD) (cm)	215x80x60				
Cabinet Weight	590Kg	590Kg	730Kg	730Kg	880Kg
Interface with HITD	SNMP (Private communication)				

* Within the range of HITD can be requested from the system as 400Vac or 220Vac voltage rating.

* Technical specifications may change without notice.

HITD 900KW HITD 1050KW HITD 1200KW HITD 1350KW HITD 1500KW HITD 1650KW HITD 1800KW						
900KVA	1100KVA	1200KVA	1400KVA	1500KVA	1700KVA	1800KVA
380-400-415Vac ±10%						
208-220-240Vac ±10%						
50 / 60Hz ±1Hz						
3 Phases + Neutral						
1500A	1835A	2000A	2345A	2505A	2840A	3000A
2745A	3360A	3660A	4270A	4575A	5190A	5490A
<1000m						
0°C ~ +50°C						
0% ~ 95% Non condensing						
Standard - IP21						
Forced Air						
215x400x60	215x480x60		215x560x60	215x640x60	215x720x60	
2870Kg	3460Kg	3540Kg	4130Kg	4640Kg	5230Kg	5310Kg
SNMP (Private communication)						

HITD 900KW HITD 1050KW HITD 1200KW HITD 1350KW HITD 1500KW HITD 1650KW HITD 1800KW						
1080KVA	1260KVA	1440KVA	1620KVA	1800KVA	1980KVA	2160KVA
380-400-415Vac ±10%						
208-220-240Vac ±10%						
50 / 60Hz ±1Hz						
3 Phases						
1800A	2100A	2400A	2700A	3000A	3300A	3600A
3300A	3850A	4400A	4950A	5500A	6050A	6600A
<1000m						
0°C ~ +50°C						
0% ~ 95% Non condensing						
Standard - IP21						
Forced Air						
215x80x60	215x160x60					
880Kg	1180Kg	1180Kg	1460Kg	1430Kg	1760Kg	1760Kg
SNMP (Private communication)						