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Epower Zone

Solar and high frequency transformer-based industrial inverters are the latest in the market

These inverters offer a high degree of reliability, reduced size of components, have increased safety and a longer life

By Kartiki Negi

Industrial inverters are designed to handle heavy loads on a daily basis. These inverters have a wide operating range, which means they can handle both cold and hot temperatures. They are used in all the sectors in which power backup is required, like telecommunications, manufacturing, aviation, commercial buildings, hospitals, malls, etc.

Industrial inverters are not only getting more advanced but smart too. Based on the most advanced DSP technology, these inverters offer pure sine wave output, ensuring total safety of the appliance and machinery connected to them. Today, the simple network management protocol (SNMP) enables the monitoring of inverters from remote locations. These inverters are also equipped with advanced charging technologies that ensure longer life of the batteries connected to them.

Nowadays, customers can choose from several options available in the market, based on their needs. "Several kinds of inverters are available for different applications, such as solar inverters for rooftop applications (which are replacing DG sets), inverters for pumping applications and for lifts, etc. These customised solutions help buyers to choose the right solution for their needs," says

GENUS' ADVANCED DSP-BASED INVERTERS

- DSP-based intelligent control circuit
- Delivers 100 per cent pure sine wave, ensuring round-the-clock protection to appliances
- AISC (auto sense intelligent control circuit) technology protects the battery and regulates charging current
- Automatic power factor correction
- Remote monitoring through SNMP module
- Low total harmonic distortion



CONSUL CONSOLIDATED'S POWERON SERIES OF INVERTERS

- Transformer-based inverter
- Capable of handling 100 per cent unbalanced output with changeover through static switch
- Heavy duty charger ensures superior charging of batteries
- Suitable for industrial applications and environments
- Has a pure sine wave output
- DSP-based technology for high reliability, efficiency, connectivity and cost effectiveness
- Remote monitoring and Battery Monitoring System (BMS) ensure monitoring of the inverter



J K Agarwal, director, marketing, Genus Power Infrastructures Ltd.

What's latest in the market

Solar powered inverters: Convergence Power Systems launched its LSX hybrid range of industrial

inverters in January 2014. Ranging from 2 kVA to 60 kVA, these inverters can run on solar energy as well. The built-in solar charge controllers and associated circuits get activated only when the user connects the inverter to the required number of

solar panels. Until then, it works as a standalone inverter. "The application areas for these inverters includes telecommunication towers, hospitals, labs, commercial establishments, PLC-controlled heavy duty industrial equipment, and many more," says Sreekumar, director, sales and marketing, Convergence Power Systems.

Emerson Network Power Pvt Ltd offers the Liebert ESU 1 to 100 kW off-grid solar inverter and Liebert EEU 1 to 250 kW grid connected solar inverter. Liebert ESU (energy storage unit) is a single/ three phase output, bi-directional inverter system and operates in parallel with the grid utility. Solar photovoltaic panels convert solar energy into electrical energy as DC power. This DC power is used to charge the load through the inverter. Additional energy is exported to the grid.

Liebert EEU (energy export unit) is a single/three phase output inverter, with grid interactive feature. With similar features of solar photovoltaic panels, it converts solar energy into electrical energy as DC power. "This DC power becomes the input for the EEU inverter. The inverter converts it into conventional AC power and with its state of the art grid synchronisation design, this AC power is fed to the supply grid," said Jitendra Sonar, director-product management, solar, Emerson Network Power Pvt Ltd.

Compact and noiseless: In December 2013, Volta Powerlink Pvt Ltd launched a series of microcontroller-based pure sine wave inverters ranging from 6 kVA to 150 kVA. "This series of inverters is designed for high inrush/peak current handling capacity. It has crystal controlled output frequency with a compact and well engineered architecture. The inverters in this series operate smoothly and silently, and offer superior performance," says Sandeep Agarwal, director Volta Powerlink Pvt Ltd.

CONVERGENCE'S ISX HYBRID RANGE OF INDUSTRIAL INVERTERS

- Solar synchronised DSP hybrid technology
- Solar Charge Controllers (SCC) ranging from 24V to 384V DC
- PWM as well as MPPT enabled SCC
- Reduced THD
- Controlled output power

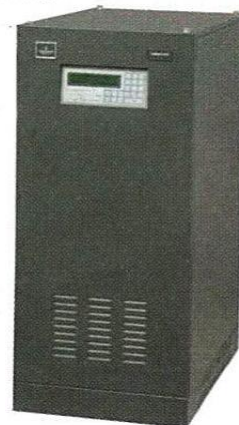


Non-polluting inverters: Su-Kam Pwer System Ltd's Colossal series of DSP sine wave inverters is powered with reliable, regulated and stabilised pure sine wave output, which is appropriate for heavy duty usage, offering standard as well as customised solutions from 5 kVA to 100 kVA. It is ideal for all types of commercial establishments like telecom towers, labs, manufacturing facilities, etc. "The Colossal series produces 100 per cent pure power, which makes it absolutely safe to run even the most sensitive electronic equipment. Since it runs on battery, the inverter is completely non-polluting and can be comfortably placed in any working environment," explains Kunwer Sachdev, founder and MD, Su-Kam Power Systems Ltd.

The Colossal series is equipped with an advanced LCD display, which provides information regarding status, remedial actions needed, battery charge level and load level, to name a few. "It comes with a range of

EMERSON'S LIEBERT ESU

- Micro processor based design
- Bi-directional solar inverter with MPPT charge controller
- Hybrid inverter operation with DG
- Inbuilt LCD display
- Built in output isolation transformer



features designed to optimise battery performance and enhance its life. Besides, it provides an option wherein the user can increase the number of additional batteries, hence increasing the back-up power as per the requirements," says Kunwer Sachdev.

Green solutions: Consul Consolidated Pvt Ltd offers the Poweron series of single- and three-phase industrial inverters. These are available in capacities up to 250 kVA, suitable for handling heavier loads like air conditioners, lifts and elevators, emergency lighting for large buildings, power backup of non-critical applications, etc. It also comes with solar option. "The Poweron series of inverters leads to cost savings when compared to online UPS systems for the same application. This is an ideal green alternative for either a DG set or UPS system. Compared to a UPS system, the running cost would be much lower and when compared to a DG set, it is a noiseless, smokeless, pollution-free alternative," says N P

VOLTA POWERLINK'S MICROCONTROLLER-BASED PURE SINE WAVE INVERTERS

- High inrush/peak current handling capacity
- Pure sine wave output
- High frequency PWM inverter
- Crystal controlled output frequency
- Compact and well engineered architecture
- Smooth and silent operation



verter offers exceptional performance and efficiency levels, even with its low footprint.”

IGBT-based PWM technique: Manufacturers are now incorporating the widely used and developed semiconductor – the IGBT (insulated gate bipolar transistor), in inverters. Along with the pulse width modulation (PWM) technique, IGBT-based inverters provide maximum operational efficiency and thus even the non-linear loads are fed with precise sinusoidal signals. “Today, almost all systems are built based on the IGBT-based PWM technique, with advanced features for enhanced performance and reliability,” says Sandeep Agarwal.

Adds N P Krishnan, “IGBT-based PWM sine wave inverter systems, with synchronised static switches, minimise the transfer time.”

Remote monitoring through SNMP module: Most inverters can now be remotely monitored through the simple network management protocol (SNMP). “With remote monitoring through the SNMP interface and a battery management system, a customer can closely monitor the inverter,” says N P Krishnan.

Solar power-based technology: Solar inverters are the latest trend in the industrial inverters domain. These reduce costs tremendously as well as increase the energy efficiency. Convergence Power Systems has come out with maximum power point tracking (MPPT) enabled solar charge controllers, ranging from 24 V DC to 384 V DC, that ensure optimum solar utility.

Emerson Network Power Pvt Ltd’s Liebert ESU is a bi-directional solar inverter with the inbuilt MPPT charge controller ensuring high reliability and efficiency.

Transformer-based inverters: Transformer-based inverters nullify the effect of triplen harmonics, which is considered dangerous,



J K Agarwal, director, marketing, Genus Power Infrastructures Ltd



Kunwer Sachdev, founder and MD, Su-Kam Power Systems Ltd



N P Krishnan, director, marketing, Consul Consolidated Pvt Ltd



Sreeekumar, director, sales and marketing, Convergence Power Systems Pvt Ltd



Sandeep Agarwal, director, Volta Powerlink Pvt Ltd



Jitendra Sonar, director, product management, solar, Emerson Network Power Pvt Ltd

few years back. Now, there are high frequency transformer-based inverters that offer a high degree of reliability, reduced size of components, and increased safety because of the isolation between the utility and load.

DSP technology: Today, most of the industrial inverters are based on digital signal processing (DSP) technology, which increases efficiency and density, and improves the total harmonic distortion (THD). Genus Infrastructures’ inverter series comes with an advanced DSP-based intelligent control circuit that delivers 100 per cent pure sine wave, ensuring round the clock protection to the appliances. “DSP based technology ensures that customers get high reliability, efficiency, connectivity and cost effectiveness,” says N P Krishnan.

Says Kunwer Sachdev, “Because it uses DSP technology, along with high performance components, Su-Kam Power System Ltd’s DSP sine wave in-

verter offers exceptional performance and efficiency levels, even with its low footprint.”

Krishnan, director, marketing, Consul Consolidated Pvt Ltd.

Advanced DSP-based inverters: Genus Power Infrastructures Ltd’s single-phase and three-phase heavy duty DSP pure sine wave inverters are available from 3.5 kVA to 60 kVA. “These are perfect for heavy duty appliances and equipment. Their applications include telecom towers, elevators and escalators, etc,” says J K Agarwal.

Technological advances

Inverters today are vastly different from those that were available a

as this leads to overheating of the building wiring, resulting in tripping, and causes random end-user equipment failure.

“Emersons’ Liebert EEU and Liebert ESU come with built in output isolation transformers up to 100 kW,” says Jitendra Sonar.

Buying tips

With the market getting flooded with a variety of industrial inverters, it is very important for customers to understand what type of inverter matches their requirements. Only then can one get a better return on investment (RoI). The most important factor while buying any industrial inverter is the safety of the machines and equipment as well as the running cost efficiency.

There are certain factors, which when kept in mind, can help buyers to choose the right inverter. These are load requirements, backup time, application requirements, location, serviceability, the AMC, etc.

Application: Before zeroing in on any inverter, buyers need to be very clear about the application and load size for which the inverter is required—whether it is required for heavy machinery, lifts, home/office load, etc. There are specialised inverters available for different applications.

Load requirements: The total load requirement needs to be ascertained before selecting an inverter, that is, the maximum load a buyer wants to run and the minimum load which will run when the mains supply is unavailable. One must conduct a proper study with a power analyser to ascertain the required load. This will help buyers to understand the power factor and other parameters such as the changeover time that an inverter can tolerate. “Sometimes a buyer may want to run the entire load available at his facility when, actually, there is no need to run the entire load and an inverter that supports a limited load can serve the purpose. Hence, an inverter with a small capacity can be purchased instead of going in for a higher capacity, resulting in a good amount of savings,” says J K Agarwal.

Backup time requirements: Being clear about this aspect helps buyers to choose the right inverter with the correct battery capacity. Customers should check on the power quality at the site for proper sizing of the inverter and backup. The backup time requirement can be determined by the total blackout time during a day, the frequency of power cuts, etc. For lower backup

SU-KAM'S COLOSSAL SERIES OF DSP SINE WAVE INVERTERS

- Advanced LCD display
- DSP and soft start technology
- Pollution free
- Safe for sensitive equipment



needs, a battery with lower capacity can be used.

After sales service: It is very important to choose the right brand. The service network of a brand defines the time required to service an inverter. There are many brands that offer AMCs (annual maintenance contracts) with the product. The AMC helps customers to save money once the warranty is over. **EEB**

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