

# AUTOMATION & MOTION CONTROL SOLUTIONS



**IE POWER TECHNOLOGIES PVT. LTD.**

## BACKGROUND

Established in 2009, IE Power Technologies Private Limited (IEPT), a group company of Integrated Electric Company Private Limited, Peenya, Bangalore is engaged in the design, development & manufacture of innovative power electronic products used for motion control applications.

Being part of a group that has been producing a large range and variety of rotating machines for the last 32 years, we are very strong when it comes to motor and generator controls of all descriptions.

The products have all been developed in-house and we have complete and comprehensive knowledge of all hardware, software and application aspects.

We have a deep respect for quality and spare no efforts to ensure that our products are reliable and make money for our customers.

We thrive on building products that cater to specific applications and use our deep core competence in machines and controls to drive solutions that provide substantial value for our customers.

This catalogue is designed as a library that details various products and solutions that have been developed by this company but is by no means exhaustive; we are happy to develop products that are tailored for individual requirements.

## PRODUCT PORTFOLIO

### CORE PRODUCTS

Induction Motor Variable speed drives  
Active front end regenerative drives  
Brushless DC and Permanent Magnet Synchronous Motor drives  
Generator Excitation Controls  
Sine wave inverters

### APPLICATION SPECIFIC PRODUCTS

AC 4 Quadrant drive, motor and PLC package for batch type sugar centrifuges  
BLDC motor and control packages for railway coach fans  
Solar powered AC Variable Speed Drives for induction motor pumps

### FUEL SAVING & GREEN PRODUCTS

DC Variable Speed Diesel Generating Sets for telecommunication towers  
AC Variable Speed Diesel Generating Sets for backup and continuous power applications  
Auxiliary power units for Diesel Locomotives  
Windmill generators powered Battery chargers

## AC VARIABLE SPEED DRIVES

### Features

The INVECTOR S-Series features V/F Control & the INVECTOR V-Series features sensor and sensorless Vector Control. The main features of these drives include:

- IGBT/IPM based Inverter
- Advanced DSP based Control
- Programmable Digital and Analog Inputs & Outputs
- Selectable Ramp or Coast to Stop
- Catch on the fly startup
- DC Injection Braking
- Two Line 16 Character LCD Display
- Facility to Review last 20 Faults
- Simultaneous Display of Voltage, Current & Speed
- Overload Capacity of 150% for 60 Seconds & 180% for 2 Seconds
- Selectable V/F Pattern
- Shaft Encoder Feedback
- Optional Dynamic Braking or Regenerative Braking
- Inbuilt PI Controller
- RS485 serial communication interface



### Protections

Under voltage, Over voltage, Inverse time, Short circuit & Over temperature

### Optional Accessories

Input EMI Filter, Output EMI Filter, Input Choke, Output Choke, Switchgear, PLC

### Ratings

S.NO	O/P kVA at 415V	MODEL		Max. Cont. O/P Current (A)	MOTOR RATING	
		INVECTOR S	INVECTOR V		kW	HP
1	1.5	IVEC 01S	IVEC 01V	2.0	0.75	1.0
2	2.9	IVEC 02S	IVEC 02V	4.0	1.5	2.0
3	4.0	IVEC 03S	IVEC 03V	5.5	2.2	3.0
4	6.1	IVEC 05S	IVEC 05V	8.5	3.7	5.0
5	9.3	IVEC 07S	IVEC 07V	13.0	5.5	7.5
6	11.5	IVEC 10S	IVEC 10V	16.0	7.5	10.0
7	12.9	IVEC 12S	IVEC 12V	18.0	9.3	12.5
8	17.2	IVEC 15S	IVEC 15V	24.0	11.0	15.0
9	23.0	IVEC 20S	IVEC 20V	32.0	15.0	20.0
10	27.3	IVEC 25S	IVEC 25V	38.0	18.5	25.0
11	32.3	IVEC 30S	IVEC 30V	45.0	22.0	30.0
12	43.1	IVEC 40S	IVEC 40V	60.0	30.0	40.0
13	51.7	IVEC 50S	IVEC 50V	72.0	37.0	50.0
14	61.0	IVEC 60S	IVEC 60V	85.0	45.0	60.0
15	81.9	IVEC 80S	IVEC 80V	114.0	60.0	80.0
16	114.0	IVEC 100S	IVEC 100V	155.0	75.0	100.0
17	129.4	IVEC 125S	IVEC 125V	180.0	90.0	125.0
18	155.3	IVEC 150S	IVEC 150V	216.0	110.0	150.0
19	186.9	IVEC 180S	IVEC 180V	260.0	132.0	180.0
20	227.1	IVEC 220S	IVEC 220V	316.0	160.0	220.0
21	283.9	IVEC 270S	IVEC 270V	395.0	200.0	270.0
22	359.4	IVEC 340S	IVEC 340V	500.0	250.0	340.0

## FRONT END CONVERTERS

The Front End Converter (FEC) is mainly employed in Four Quadrant applications that demand regeneration. The FEC converts AC to DC (during motoring) or DC to AC (during regeneration) and maintains a constant DC bus voltage irrespective of input voltage fluctuations. When the prime mover is in motoring mode, the FEC draws power from the mains and when it is in the generation mode, it feeds power back to the mains.

### Applications

- Batch type Sugar Centrifuges
- Crane drives
- Entry and Exit Tension Reels
- Unwinders in paper
- Elevator Drives
- CNC machine spindle drives

### Salient Features

- IGBT/IPM based Power circuit
- Advanced DSP based Control
- The input power factor is maintained close to unity under all operating conditions
- The FEC features harmonic filtering and the input current waveform is sinusoidal both in motoring and in regeneration modes
- Due to the presence of the boost converter the motor can be used to its rated voltage capacity despite the mains supply voltage being lower
- A single FEC can support multiple inverters at its DC Link
- Conversion of existing 2 quadrant inverters with dynamic braking to regenerative drives for energy cost savings

## SUGAR CENTRIFUGE DRIVE & MOTOR

**IEPT offers a complete package of motors and drives for AC Batch Type Sugar Centrifuges of various sizes.**

### Salient Features

- AC Motors suitable to be mounted with baskets manufactured by any supplier
- All necessary incoming switchgear, protection & metering
- Sensorless Vector Control based IGBT bidirectional Converters
- Advanced PLC based Process Control
- Graphical HMI to enter centrifuge parameters
- Special circuitry to allow quick start at the beginning of the season
- Improved harmonic filtering and maintenance of the quality of the grid inside the factory
- Low energy cost per Ton of sugar produced





## PERMANENT MAGNET SYNCHRONOUS MOTORS & DRIVES

- Highly compact Permanent Magnet Motors in both open type and totally enclosed variants
- Higher Torque than standard induction machines with the same footprint
- Very quick dynamic response owing to lower moment of inertia and vector control
- Suitable for very low speed operation
- Applications include injection moulding machines, spindle drives, paper mills etc.



## LOW COST- LOW POWER DRIVES

- Highly versatile multi purpose low power drives starting from 30 Watts that can be run from either a battery source or AC source
- Suitable for running low power Induction or Brushless DC motors
- Micro controller based Control
- IPM based Inverter
- Simple construction & compact size
- Smooth operation
- Moulded PCB for aggressive environments
- Applications include railway fans, cheese winders, textile winders, etc



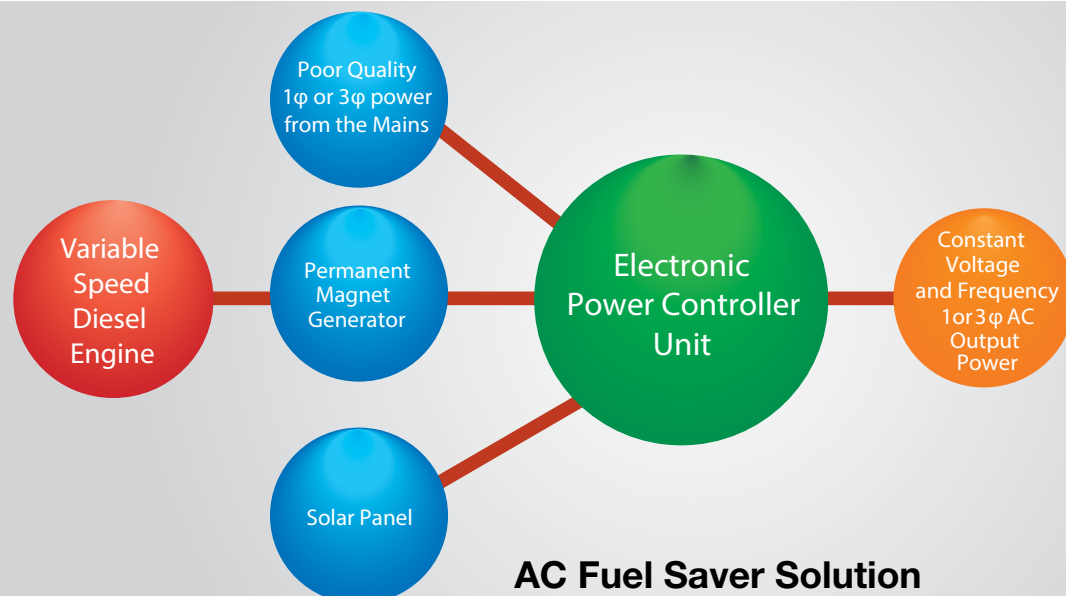
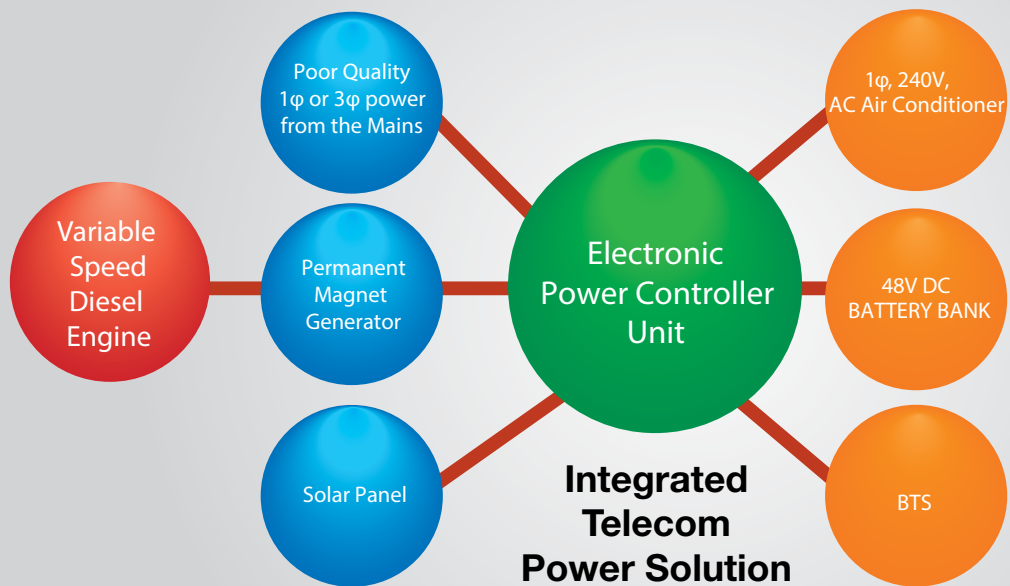
## DRIVES FOR SOLAR WATER PUMPS

- Inbuilt MPPT Controller for maximum utilization of solar power
- Programmable pump speed range
- IGBT based Inverter
- Suitable for hybrid operation with maximization of solar utilization



## VARIABLE SPEED DIESEL GENERATING SETS

- The diesel engine consumes a minimum amount of fuel if it is made to run at an optimum speed while delivering a given load
- Standard Diesel Generating Sets operate at a fixed speed irrespective of the power demanded by the load to ensure that the output electrical frequency and voltage are maintained within narrow limits at all load levels
- Variable Speed Diesel Generating Sets adjust the speed of the diesel engine depending on the load
- DC Hybrid solutions supply DC output to the load whereas AC Hybrid solutions supply constant voltage and frequency power to the load
- IEPT supplies permanent magnet generators and controllers as well as complete diesel generating sets depending on the customers requirement



## FUEL SAVING AUXILLARY POWER UNITS FOR RAILWAYS



### Generator Features

- Wound rotor and permanent magnet generators
- IP55 protection class
- Compact Size
- High efficiency



### Controller Features

- Advanced battery charging algorithm
- Low output ripple
- Isolated or non isolated models
- 2 and 3kW models at 72 V DC
- Suitable for Fixed or Variable speed Diesel engines
- Serial communication interface

## WINDMILL GENERATOR AND CONTROL PANEL



### Generator Features

- 0.25 to 10kW permanent magnet machines
- IP55 protection class
- Compact Size
- High efficiency
- Low speed generator suitable for direct coupling to the turbines without a gearbox



### Controller Features

- Advanced battery charging algorithm
- Highly efficient MPPT charger
- Low output ripple
- Suitable for 24/48/72 V DC Batteries



## SOLUTIONS FOR EDUCATIONAL & RESEARCH LABORATORIES



### DIGIVAC – DSP based motor controller trainer kit

- Jointly developed with the Indian Institute of Science (IISc)- Electrical Engineering Department to cater to the educational requirements of undergraduate and post graduate students
- Consists of an Induction Motor- DC Generator coupled set, IGBT inverter and DSP controller
- Consists of Experiments and Solutions manual that leads the students step by step into higher levels of complexity till they are able to clearly comprehend motor control algorithms
- Has been supplied to all premier institutions in the country like the IIT's, NIT's etc.

### IGBT Hardware stack

- Ready to use IGBT power converter hardware to enable research scholars to focus on core algorithm and control development
- The System consists of IGBT's mounted on a Heatsink, Drivers, Capacitors and Sensors
- The hardware is protected against short circuit & Over current faults
- The hardware is suitable for different types of power converter configurations like DC-DC,DC-AC, AC- DC etc.

### Advanced Motor Controller Lab Kit

- Comprehensive motor control educational kits with multiple configurations of Motor Generator sets containing Induction Motors, PM Synchronous Motors, DC Motors & BLDC Motors
- Fully regenerative IGBT bidirectional converters suitable for 4Q operation
- Advanced loading systems with a very high efficiency and low mains power utilization
- Sensors suitable for torque & speed measurement
- Isolated & protected test points for PWM Pulses, Voltages & Currents
- Hardware suitable for control through external controllers

### Doubly fed Induction Generator (DFIG) & Controller Set

- Used in research work on control of DFIG's
- The system consists of an Induction motor coupled with a DFIG
- IGBT converter is used for advanced DSP based Rotor side control
- Active Front End converter for super synchronous operation
- Variable frequency drive for adjusting prime mover speed



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