



**Centre For Industrial Solution and Advanced Training**

**AN ISO 9001:2015 CERTIFIED**

Centre for Industrial Solution and Advanced Training

# **TRAINING PROGRAM ON HT-LT MOTOR, VARIABLE FREQUENCY DRIVES (ELECTRICAL DRIVES)**

**13-15 Feb 2018, Kolkata**





(Technical- Electrical/Mechanical/Automation/Chemical, Behavioral & Soft Skill, Safety, Business Excellence, Safety & Energy Audit)

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**“A complete Training Solution Under One roof”**

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**3 Days Training program on**  
**HT/LT MOTOR AND VARIABLE FREQUENCY DRIVE (VFD/VVVF/AC)**  
**(Fundamentals; Operation; Maintenance & Parameter Setting)**

**13-15 Feb 2018, @Kolkata**

**Training Program Objective and Description:**

The objective of this program is to provide the participants with information needed to install, commission, troubleshoot, diagnose, and repair problems commonly found in HT/LT Motor, Electrical Drives beside thoroughly understand the concept of Motor and Electrical Drives. Practical hands-on exercises will reinforce material presented in the training sessions. This program will impart information important to proper motor selection, operation and Maintenance, Troubleshooting in detail.

**Learning Outcomes:**

Upon completion of this course, the participant should be able to:

- Understand characteristics of AC/DC LT/HT motors which drive control.
- Know the components and types of variable frequency drives.
- Understand common AC/DC drive applications and how to evaluate them.
- Understand the advantages and benefits of using variable frequency drives.
- Setting of various Drives Parameters & communication. **(Hands on)**
- Understand how to troubleshoot AC drive applications.

***Who Should Attend?***

*All practicing Engineers, DET, GET, O&M professionals; others who willing to get knowledge regarding VFD/AFD.*

***Program Contents to be covered:***

1. LT/HT Motor: Fundamental; Construction; Operation, Maintenance, Speed Control, Fault and troubleshooting, Protection; Applicable standards, Earthing.



2. Overview of **Electrical Drives (AC/DC)**. Objective of the Program.
3. Review of Basics of Electrical Engineering.
  - a. Fundamental of Voltage, Current, Power & Impedance.
  - b. Resistance, Inductance & Capacitance. **Behavior & Applications**
4. Basics of various loads and Applications.
5. Torque, Speed and Power. Review and understanding.
6. **Basics of Power Electronics.**
  - a. Review of semiconductor Theory; Controlled and Uncontrolled Switches: Power Diode, Power BJT, MOSFET, IGBT, SCR: ON & OFF strategies.
  - b. DC Link capacitor: Selection and rating.
7. **AC to DC Rectification action.**
  - a. Variation with R, R-L, R-L-E load; About filter application and ripples.
  - b. **Applications**
8. **DC to AC Inverter**
  - a. Inverter function: Series and parallel Inverter.
  - b. Importance of L & C.
  - c.  $120^\circ$  &  $180^\circ$  Mode of operation.
  - d. PWM & SPWM control Strategy.
9. **Electrical drives (AC/DC)**
  - a. Basics and review of Drives: Advantages and various parts.
  - b. Requirement of four quadrant operation of Drives.
  - c. Open and Closed loop control strategies.
  - d. Induction Motor Drive
    - i. Starting, Braking and Speed control Operation
    - ii. Stator voltage Control; Variable frequency control
    - iii. CSI Controlled AC Drives;



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- iv. Rotor Resistance Control; V/f control; Direct torque Control; Vector Control; Sensor less Vector Control
  - v. Flux Control methods; Smart Drives & Energy efficient drives.
  - vi. Soft Starting: ZCS & ZVS; Design of control Strategies: Various Comparator Circuits
  - vii. Concept of Load Sharing: Criteria
  - viii. Drive parameters: definitions and parameter setting.
10. Installation and commissioning of Electrical Drives.
  11. Common problems in Electrical Drives and Troubleshooting
  12. Testing, Maintenance & Protection of Drives using various meters.
  13. Harmonic Elimination Techniques
  14. Communication of drives.
  15. Understanding of various drives: Product Specific as required.
  16. Case Studies & Discussion on practical problems.

### Hands ON & Practical' s:

1. Parameter Setting & Behavior of drive.
2. PLC and Drive Communication
3. Upload and Download of parameters.
4. Copying of Drive parameters.
5. Control of Drives
6. Installation & Commissioning

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**Expert:** Trainer having 20+Yrs experience and involved in Installation and commissioning activities of Electrical Drives.

### Registration Details:

**Dates of the program:** 13-15 Feb 2018 (3 Days).



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**Participation fees:** Rs. 27 000/- Per participant (GST@18% Extra; Excluding Lodging and Boarding, Including Course Material, Lunch, Snacks & Course Material)

**Payment:** ECS/NEFT/DD in favor of “Centre for Industrial Solution and Advanced Training” Payable at Nagpur, Maharashtra, India. Account No: 0509102000003353  
Bank: IDBI, Wardha- 442001, MS, India; IFSC Code: IBKL0000509; Swift Code IBKLINBB007; MICR Code 442259001.

**Venue:** Hotel The Lindsay@Kolkata

**For Registration please do contact to,**

We prefer on line Registration through our web [www.cisat.co.in](http://www.cisat.co.in).

1. Vikas +91-8669546332; 7709012815; vikas@cisat.co.in; cisat.nagpur@gmail.com;
2. Mahendra Dhande 09168326662,

**Contact for any In-house Training Program at your plant or location.**

## Centre For Industrial Solution and Advanced Training

Web: [www.cisat.co.in](http://www.cisat.co.in); Email: [cisat.nagpur@gmail.com](mailto:cisat.nagpur@gmail.com) ; Contact: +91- 7709012815; 8669546332

Training Calendar Jan 2018 - March 2018						
Sr No	Month	Name of the Program	Date	Duration in Days	Fees in INR +GST	Location
<b>ELECTRICAL ENGINEERING</b>						
1	Jan	Electrical Power System protection; Parameters, Relay Setting and Relay Coordination	18-20 Jan	3	27000	Nagpur
2	Jan	Design of a reliable and cost effective Advanced Electrical Power system for Industrial Applications	23-25 Jan	3	27000	Hyderabad
3	Feb	Power and Energy Efficiency Management in Industrial Utilities & Power Factor Improvement	1-3 Feb	3	24000	Nagpur
4	Feb	Electrical Safety; International Standards & Auditing	12 Feb	1	8000	Kolkata

Web: [www.cisat.co.in](http://www.cisat.co.in); Email: [vikas@cisat.co.in](mailto:vikas@cisat.co.in) ; Contact:+91- 7709012815 (Branches: Thane/Pune/Nagpur/Bhilai/Wardha)

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5	Feb	HT/LT Motor; Electrical Drives; VVVF; Soft Starter (Fundamental; Operation, Maintenance; Troubleshooting; CBM; Hands ON, Parameter Setting)	13-15 Feb	3	27000	Kolkata
6	Feb	Power System protection; Relay Setting and Coordination	19-21 Feb	3	30000	Goa
7	Feb	Power Factor Improvement Techniques: Design & Industrial Applications	26-27 Feb	2	20000	Banglore
<b>Mechanical/Production Engineering</b>						
1	Jan	Hydraulics & Pneumatics and Valve: Operation, Maintenance, Troubleshooting and PPMT	9-10 Jan	2	18000	Nagpur
2	Feb	Pump and Air Compressor: Operation, Maintenance, Troubleshooting and PPMT	9-10 Feb	2	18000	Kolkata
3	March					
<b>Performance Improvement and Best Maintenance Practices</b>						
1	Jan	Reliability Centered Maintenance (RCM)	12-13 Jan	2	18000	Nagpur
2	Jan	World Best Engineering and Modern proactive Maintenance Practices for safe, reliable, compliant and competitive performance.	29-31 Jan	3	27000	Nagpur
3	Feb	Predictive Preventive Maintenance Techniques and NDT	16-17 Feb	2	20000	Goa
<b>Process; INSTRUMENTATION, AUTOMATION AND CONTROL</b>						
1	Jan	Pipeline & Terminal Valves, Control Valves & Actuators: Operations & Maintenance, Selection	22-23 Jan	2	18000	Pune
2	Feb	PLC, SCADA & Engineering Applications (Programming; Parameters; Communication; Case Studies & Plant Applications)	5-8 Feb	4	28000	Kolkata