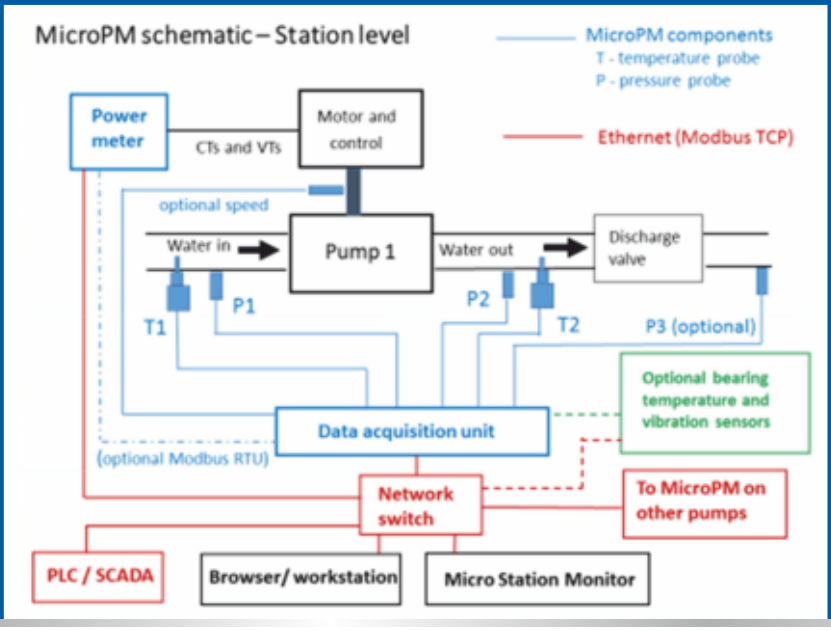
Techno Green Solutions Pvt. Ltd.

ISO9001 : 2015 Certified Company

Deal in Following Verticals

* Pump Performance Measurement & Monitoring Equipment - Exclusive India Representative of Robertson Technology, Australia.
* Pump Energy Audit.
* Induction Motor Efficiency & Performance Measurement and Monitoring.
* Vibration Measurement & Monitoring Equipment - Useful for predictive maintenance for all types of rotating
  - Equipments like Pump, Motors, Compressors, Combustion Gas Engines, Conveyor Belt Drives, Cooling Towers, Fin Fans etc.
* Mechanized Screen & Sludge Dewatering Equipments for Sewage Treatment Plant, Effluent Treatment Plant and Water Treatment Plant.
* Supply of Pumps, Valves & Motors.

Thermodynamic Pump Performance Monitoring Systems From Robertson Technology.



Main Pump Parameters Measured Or Derived

* Pump Efficiency (a function of dT and dP)
* Suction Pressure
* Discharge Pressure
* Total Head
* Flow Rate (a function of dT, dP and Power)
* Electrical Motor Power
* Motor Speed
* NPSHa
* Operating Point
* Triaxial Vibration Measurement (Optional)
* Bearing (surface) Temperature Measurement (Optional)

Pump Energy Audit Experience

* Successfully completed more than 200 audits and over 3000 nos. medium & large sized pumps.
* Covered customers from all types of segments like - Cement Industries, Pharmaceutical Industries, Various Thermal & Coal Power Plants, Large Water Utilities, Municipal Corporations, All Types of Manufacturing Industries etc.

Result

* Offered complete solutions to the customers to enhance the efficiency.
* Saved millions units of electrical energy for customers and reduced carbon foot print.
* Helps customers for predictive maintenance of pumps.

Advantages To End Customer

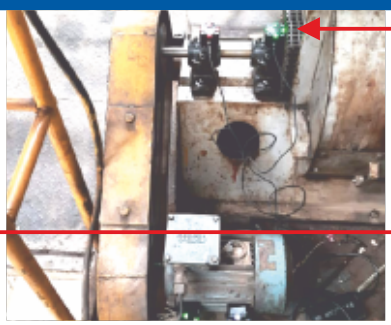
* Continuous monitoring of the critical pumps.
* Any little change will be noticed immediately.
* Immediate corrective action will save adverse effects on process.
* Deterioration of the pump will be monitored on periodical basis.
* Efficiency will be maintained at higher levels by predictive maintenance of the pumps and hence energy saving can be achieved.

List Of Few Satisfied Customers

Vibration Measurement and Monitoring Equipment

How Is IDE Deployed

* Digitize a machine in **under 1 Minute.**
* Totally **Non - invasive and self - contained**
* **Magnetic** mounting.
* **Multiple communication** option, no additional infrastructure needed.
* Extremely user - friendly and easy to use, can be **set up remotely.**



IDE

Plug - And - Play Scalable Installation

Industry Gap : Lack Of Mechanical Predictive Analytics

Typical 70% of Breakdown

* Wear Deterioration
* Backlash
* Increase In Clearances
* Vibration
* Acoustics
* Thermal

Standard IoT (Sensors + wireless Transmission)

Typical 5% of Breakdown

* Temperature
* Thermal Mapping
* Thermal Flux

Standard IoT (Sensors + wireless Transmission)

Typical 20% of Breakdown

* Hydraulics
* Pressure
* Temperature
* Flow Rate
* Contamination
* Density

Very high frequency data Difficult to decipher signal from noise Bandwidth limitations storage limitations standard IoT does not work

Typical 5% of Breakdown

* Electronics Life
* Power Surge
* Current
* Voltage
* Power Factor
* Energy Efficiency

Standard IoT (Sensors + wireless Transmission)

Case Study : Motors (Chiller Plant)

Background : A Plastic Fabric Manufacture for agriculture goods has a motor which drives chiller circulating pump in the plant.

Need : Real time monitoring of the motor located in the basement of the plant was essential to ensure the pump operation is smooth and subsequently achieve production target.

Challenge : Sudden failure of motor causing shut down of chiller leading to production losses.

Solution : IU has installed IDE on the motor connected to the pump so that equipment data can be seen on a real time basis.

Results :

1. After a fortnight, the IDE noticed high vibrations on the motor, resulting alerts.
2. The trend generated, indicated that the rise in the vibrations was due to the loosening of the nuts and bolts, causing foundation issues in the motor.

Value Driven :

1. Avoided production loss of approximately USD 26 thousand per day in the plant.
2. Saving USD 27 hundred which was the estimated cost of the customized circulating chiller pump.
3. Preventing breakdown in lamination plant.
4. Ensuring consistent operation of the production plan.

List Of Customers : 1. Hindalco, Tata Wire, India Cement & General Mills are monitored using IDE technology to predict faults in motors, pumps fans, Gearboxes. Roating equipment across captive power plants at Dr. Reddy's, JSW Salem and Deepak Fertilizer use IDE technology for predicting faults in advance. Conveyor and material handling equipment across Vizag port, Bharat Forge, JCB Tata Steel and JSW are monitored using IDE technology.

Why Industrial Data Enabler (IDE)

FEATURE	ADVANTAGES	BENEFITS TO CUSTOMER / CLIENT
Make In India Product	Every component is made in india	Quick availability of components, speed up the manufacturing process.
Plug and play installation	Installation within a minute	No need to compromise on operational schedule of the plant.
Visual LED Indicator on the machine for edge (computing)	Various colours of LED indicate the equipment status at real - time.	No training required for the shop - floor team. A change in colour of the LED's is an indication of discrepancy.
Threshold setting configurable for generating alerts	Equipment health monitoring	Threshold can be set as per ISO standards and by mutual discussions with the maintenance authorities.
Complete / End-To-End Solution	A system with hardware, software, firmware, power - cable and mounting option	No charges for cloud, dashboard, additional hardware.
CE/FCC, EMI, EMC, Ip68 Certified device	International certification ensure its application in multiple industrial segments.	Can be deployed in inaccessible, hazardous areas.
Mobile based android application	Remote monitoring is possible	Remote monitoring of equipment at any instance of time, from any geographical area is possible.
Monitors triaxial vibrations, temperature and acoustics	Captures vibrations in axial, horizontal and vertical axes, surface temperature and noise level.	Insight for decision making. Potentially predicts 80% of the faults at 20% costs.

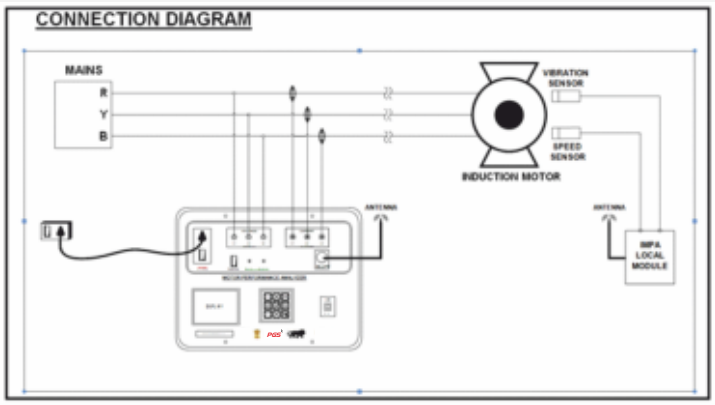
Induction Motor Efficiency and Performance Analyzer

Key Measurements With Induction Motor Efficiency and Performance Analyzer

* Electrical parameters such as Voltage, Current, Frequency, Apparent Power, Active Power, Reactive Power, Power Factor, Harmonics and Unbalance.
* Mechanical parameters such as speed in RPM, Slip, Output Power, Torque, Motor Efficiency, Total Losses, Vibration in mm/s and Temperature.
* All the parameters are measured instantly on line with one second update rate.

Principle Of Operation

* Induction Motor Efficiency and Performance Analyzer uses three phase voltage and current waveforms along with non contact speed sensor to measure shaft speed of the motor to calculate Motor Speed, Output Power, Torque and Efficiency.
* The equivalent circuit method of motor provides the basis for the measurement. The stator resistance of the motor is fed as input and using proprietary algorithms the equivalent circuit of the motor is estimated.
* The vibration and temperature are measured through dedicated vibration and temperature sensors.



Benefits To The Customer

The motor performance analyzer helps in identifying the motors for -

* Refurbishment of motor which can improve motor performance.
* Replacement of less efficient motor with energy efficient new motor.
* Checking the performance and efficiency after rewinding.
* Operating the motor around at its best operating point (BoP).
* Known benchmarks and performance trends can be created for informed preventive maintenance.

Some Advanced Level Features

* Suitable for conducting on-site energy audits of existing motors which provides scientific data to replace or refurbish the existing motor to conserve energy.
* Motor performance can be analyzed without disconnecting the motor from the load.
* Mechanical sensors, No load testing or blocked rotor testing are not required.
* Electrical parameters and mechanical parameters are shown in a single instrument.

Suitable For LT/HT Motors Of Any Capacity

* The MOTOR EFFICIENCY ANALYZER is designed to work for both LT and HT Motors. In LT motors ,the motor terminal voltages are measured directly (440VLL rms) by clipping on the motor terminals and the motor current is measured by using Clamp - ON Current Transformers (CT).

* In the case of HT motors, the motor terminal voltages are measured by connecting the MOTOR EFFICIENCY ANALYZER unit to the secondary of potential transformers (PT) used in the HT panels (110VLL rms) and the motor current is measured using clamp- ON current transformer (CT) connected in the secondary of the HT CT's installed in the HT panel (5A or 1A).

* The speed sensor, vibration sensor and temperature sensor are mounted on appropriate locations on the motor and are connected to the MOTOR EFFICIENCY ANALYZER unit through external cable. The stator resistance is measured through milli ohm meter and is fed into the MOTOR EFFICIENCY ANALYZER unit for calculations

Mechanical Bar Screens- Raked/ Linear Type

Mechanical screen with rakes of bar vertical way and linear in motion. They are installed in the wastewater channel with angle of 70 - 75°. The equipment consists of screen, motorreducer, base frame, chain mechanism, rake and rake cleaning system. The motion is conveyed to the rakes with the help of the chain mechanism. Number of the rakes depends on to the depth of channel and in the consequence of the length of the screen.

The smooth running, endless track system employs a geardriven cleaning rake to carry screenings from the submerged bar rack to a discharge chute for removal – without the use of chains, sprockets, cables or any underwater moving parts.

Applications : STP headwork: protect downstream equipment, Pumping stations ; flood control ; Water intake for remove large debris ; Ideal for both municipal and industrial use.

Benefits : Above water operation, No submerged moving parts ; Flexible & customized design, Heavy duty, wide range, Positive screening discharge.

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