Rotating Electrical Asset Prognostic AID+

REAP AID +

Electrical Machine Fault Prediction / Diagnosis

Energy cum Maintenance Optimization

The product **REAP AID +** device allows to trend electrical voltage cum current signals to diagnosis and trouble shoot the impending various electrical machines esp. electrical motor fault such as

- Input power anomalies (imbalance, distortion, power factor etc.)
- Driven machine problems (bearings, gear box, Cavitation, belts, torsional fluctuation)
- Motor Defect incl Performance
- Rotor bar deterioration / broken bar
- Air gap eccentricity - static cum dynamic
- Stator mechanical cum electrical deterioration that cause Insulation failure.
- Connection problems (turn-to-turn, turn-to-ground shorts or loose connections)

THERMAL STRESS

Thermal Aging
Voltage variation
Cyclic loading
Restricted Ventilation
Ambient Temp raise

ELECTRICAL STRESS

Dielectric Aging
Tracking Corona / Partial discharge
Harmonic Distortion
Voltage pikes/Transients
Voltage Imbalance

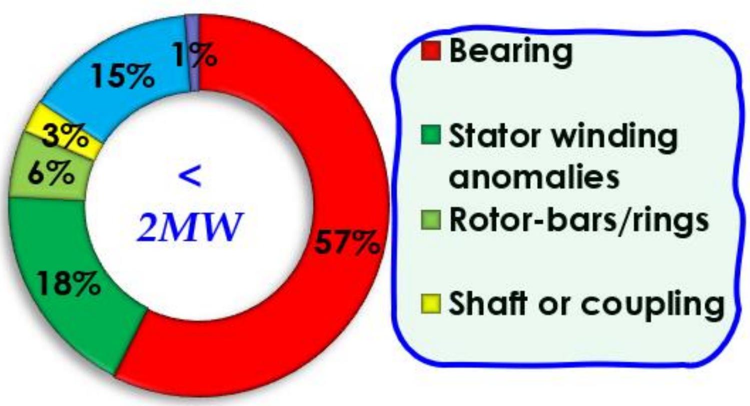
AMBIENT STRESS

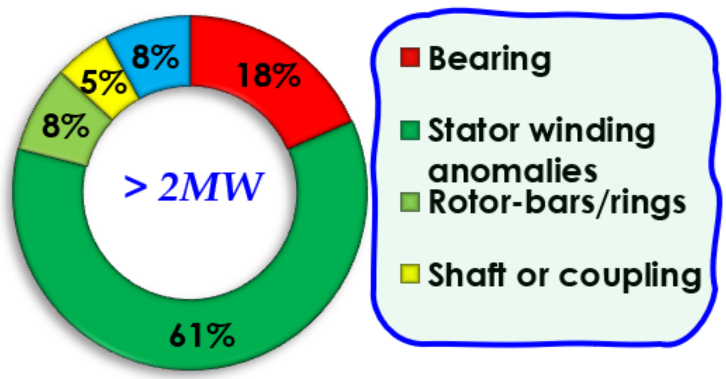
Moisture / Humidity
Corrosive Chemical
Abrasion
Damage parts
Rodents & Insects

MECHANICAL STRESS

Stator Coil Movement
Rotor Damages / Rubbing
Torsional variation
2X LF Air gap issues
Improper lubrication

Failure Predictions

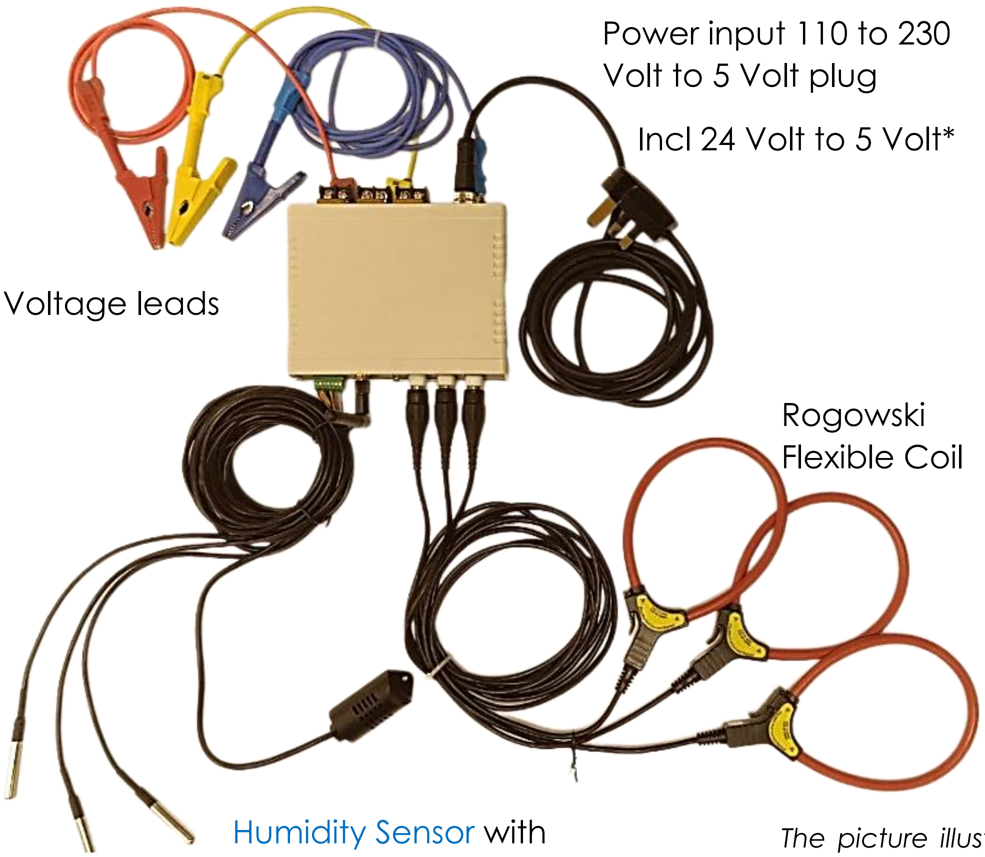


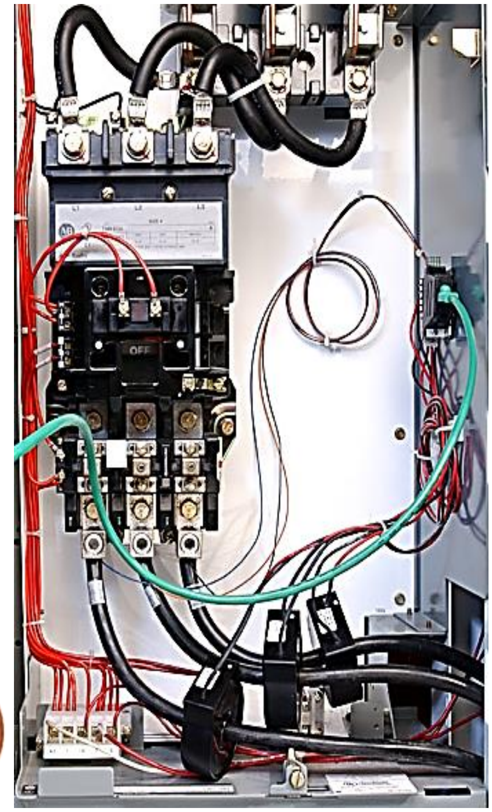


DIY
DO IT YOURSELF

αiδ.IoT+

REAP AID + PRODUCT OVERVIEW





The picture illustrates the MCC panel, where three voltage leads connected to the breaker terminal and the current probes clamped at output cable incl option to mount contact temperature sensors at 3 phase cable and humidity sensor for panel board.

REAP AID + PRODUCT SPECIFICATION

REAP AID Sensors	
• **Terminal currents (Qty 3 Nos) suits any range** • **Terminal voltages (Qty 3 Nos) up to 680 Volt RMS** • **Temperature sensors (Qty 3 Nos) up to 120 °C** • **Humidity sensor (Qty 1 No)**	Rogowski Flexible coil, mV/A (voltage-output), mA/A (current output) probes; incl Secondary CT Suitable Lugs will be provided to suit breaker termination incl Primary Transformer for High voltage Digital sensors for cable- and panel-temperature to detect any overheating issue due to looseness Digital sensors for panel-/-environment humidity to assess risk of arc flash and moisture condensation
Analog inputs	
ADC resolution and sampling rate	16-bit, 10 kHz Custom design (32 bit) for Wide Band Gap Drives / High Line Frequency VFD say 400 Hz
Monitored anomalies and variables	
• **Electrical Signature Analysis (ESA)** • **Other anomalies**	Stator interturn winding fault, broken rotor bar, Air Gap Eccentricity fault, cavitation /looseness Cable temperatures, panel humidity, voltage unbalance ratio and power harmonic distortion incl mechanical anomalies such as transmission loss / imbalance, misalignment, bearing defect loss
• **Energy Metering**	Current rms values, current-THD, frequency tracking, phasor values, cable temperatures, active-, reactive, apparent- and harmonic powers incl impendence loss due to contamination buildup
• **Additional features**	Raw V & A signals trigger at 10 kHz, trend analysis, motor-running hours and number of start stops
Data transmission	
Communication protocol and edge parameter update interval	Wi-Fi, IEEE 802.11, 12 sec (data logging to server at 12 sec, 1 min, 15 min, 30 min and 1 hour etc.) Real time parameter tending and instant visualization and alert on stator interturn faults
Physical characteristics and input power	
Dimensions, weight and power supply	140 mm x 110 mm x 35 mm, 300 g, 5 VDC, 110 to 230 VAC to 5 VDC adapter / 24 Volt to 5 V (option)
User Interface and Advance data visualizations analytics	
Web-portal user interface, data uploaded to custom on premise server or Cloud Server integration (optional)	
Machine learning and others SCADA integration, Telegram, Email Alert	
Regular tuning of adaptive trending / thresholds using machine learning, speed optimization for VFD based motors operated in parallel	