POWERTEST
Advanced Testing Solutions

MCM1

Motor Condition Monitoring

WISEGRID ENERGY

Motor Condition Monitoring

- Advanced analysis with the ESFA mind server
- Fault detection based on frequency domain spectroscopy and AI algorithms
- Automatic evaluation of fault severity
- Health monitoring based on current signals

- Current signature analysis
- Power quality monitoring
- Vibration signal analysis of electric motors
- replaceable battery packs
- Resistant to electromagnetic interference
- Battery charges in less than 4 hours
- Battery lasts for 2 hours

SOFTWARE

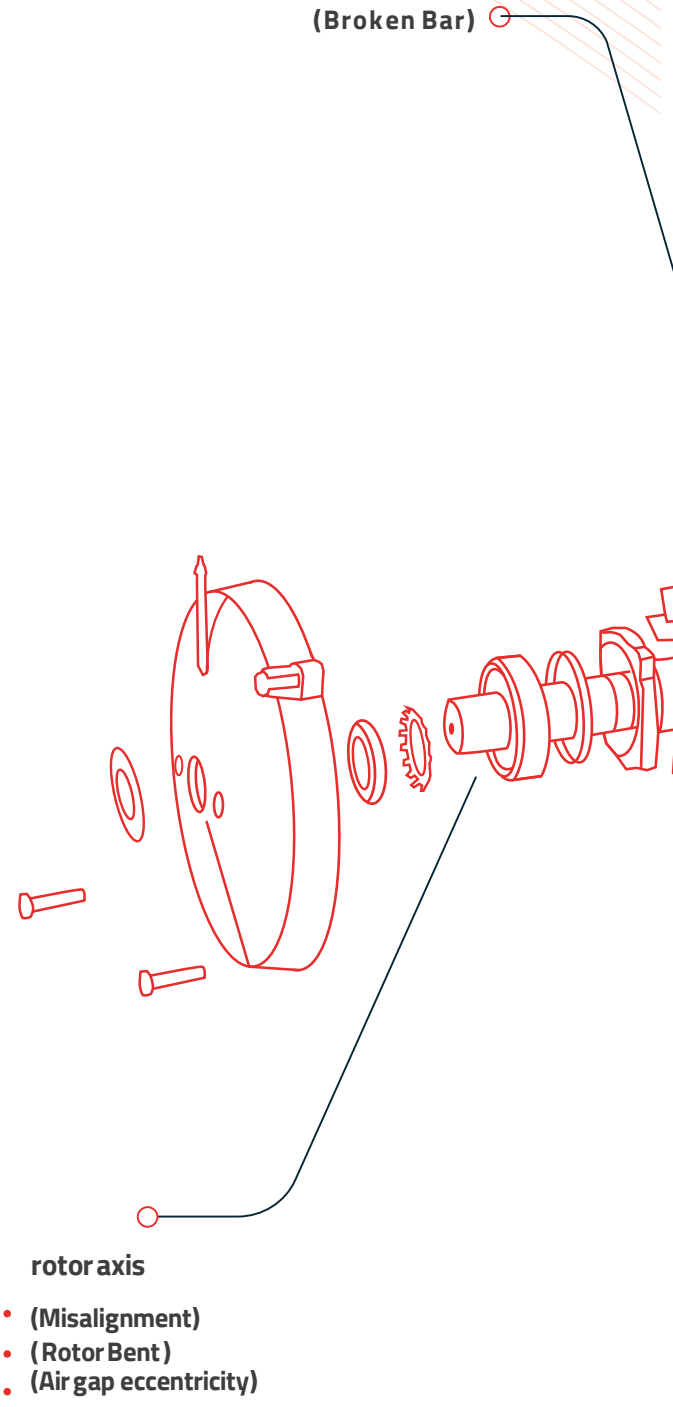
- Online monitoring of the measured signals in time and frequency domain (FFT)
- Analysis of the power quality up to the 50th harmonic for voltage and current signals
- Display of amplitude and phase of voltage and current signals in real-time
- THD Online calculation of Total Harmonic Distortion (THD) for voltage and current signals
- create a database with the capability to store data for more than 200 electric motors, expandable to 1000 motors if connected to the internet
- Display of the test history and motor fault trends
- Capability to extract stored data via USB or Wi-Fi connection
- Alerts based on periodic tests indicate motor aging
- Using model based and AI based algorithms to detect and discriminate various faults

Automatic Analysis of Electric Motor Health

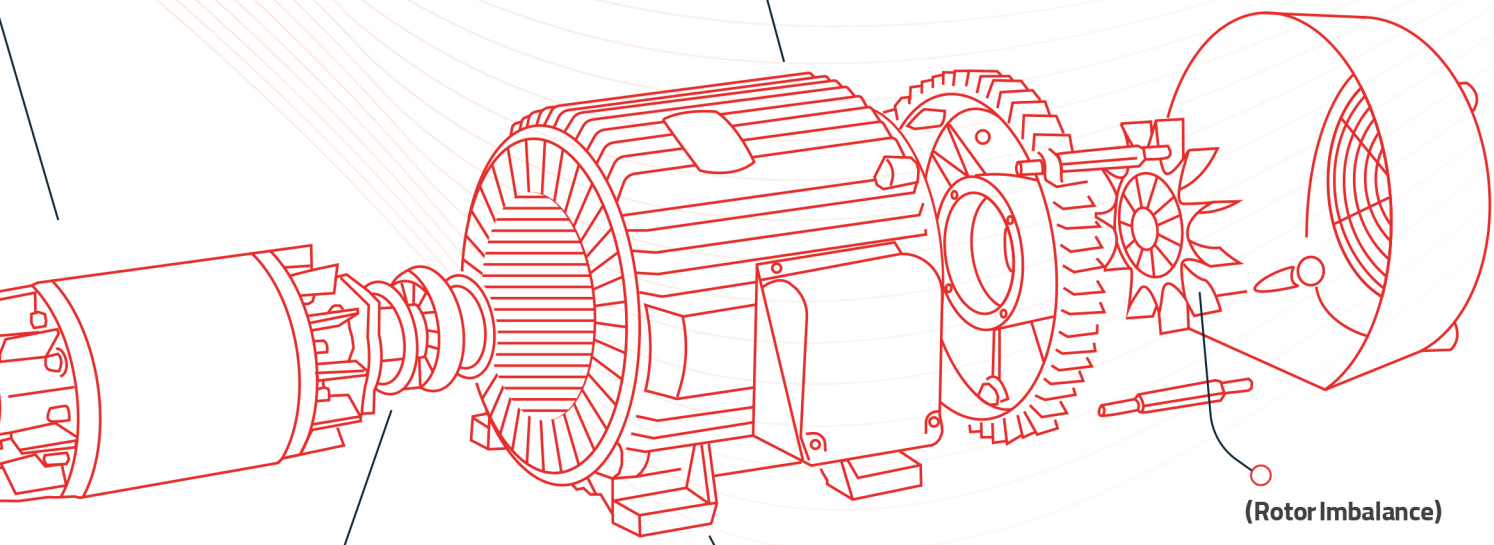
(Detectable Faults)

Three-phase induction motors are relatively expensive. As the operating voltage of the motor increases (e.g., medium voltage motors), their cost also rises. Additionally, electric motors are typically part of a process chain. Consequently, if a motor fails, part or all of the process can be disrupted, results in significant costs. Each hour of process downtime can impose a considerable financial burden on the organization, and sometimes the entire or part of the produced product may be discarded.

According to available reports, over 80% of faults in induction motors start gradually, and if not detected in the early stages they can escalate into apparent failures. Furthermore, the cost of repairing and preventing faults in the early stages (minor faults) can be up to 50% less than when the motor fails due to severe issues. This does not account for the costs associated with halting production processes.



Induction motor internal structure



Internal Stator Winding Fault

- Inter-turn fault.
- Winding (Coil) Fault.
- Phase-to-Phase Fault.
- Phase-to-Ground Fault.

(Rotor Imbalance)

(Looseness)

ballbearing

- (Outer race)
- (Ball)
- (Inner race)
- (Cage)

MCM1

Motor Condition Monitoring Device

Product Contents

- Carry bag for MCM1 Accessories
- 2 Vibration Sensors
- Power Cable
- Rogowski Coil (by order)
- 4 Crocodile Clamps
- 4 Voltage Measurement Wires
- 2 Rechargeable Battery Packs
- Grounding Cable
- 3 Current Measurement Clamps up to 1000A
- 3 current Measurement damp3 up to 10A (by order)

Technical Specifications

Parameter	Amplitude Range	Accuracy	Frequency Domain
Voltage	10v ~ 500v	1% + 1v	3Hz ~ 10kHz
Current	100mA ~ 1000A	1% + 10mA	3Hz ~ 10kHz
Vibration	-2g ~ +2g	1%	3Hz ~ 10kHz

- Sampling frequency : 32kHz
- Electrical motor diagnosing based on ISO20816 & ISO20958 standards

Equipment Type	
Motor Type	3 Phase Asynchronous Motors with or without speed controller
Voltage Level	Low and Medium Voltage
Test Duration	1min (typical) (up to 200s)
Current Measurement Inputs	
Number of Terminals	3
Connector Type	Circular Connector
Transformer Type	Split Core CT or Rogowski Coil(by order)
The measurement can be taken directly or from the secondary side of the CT	
Voltage Measurement Inputs	
Number of Terminals	3
Connector Type	Banana Socket
The measurement can be taken directly or from the secondary side of the PT	
Vibration Measurement Inputs	
Number of Terminals	2
Connector Type	Circular Connector
Hardware	
Display	10.1" color touchscreen
Internal Memory	128 GB
Communication	Wi-Fi، USB
Power Supply	
Input Connector	IEC 60320 C13
Input Voltage	220V AC 50/60 Hz
Maximum Power Consumption	150W
Battery Pack	
Type	Li-ion
Capacity	3400mAh
Nominal Voltage	25.2V
Maximum Charging Current	1A
Physical Data	
MCM1 Dimension	34×29×15 cm (W×D×H)
MCM1 Weight	5.5 kg
Accessories Dimension	32×22×27 cm
Accessories Weight	5.5kg
Operating Temperature	-10 to +55 ℃

MCM1

Accessories

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