Expert Motor Condition Monitoring - EMCM

Electrical machines are involved in all areas of modern life; they come in various sizes, and fulfill their tasks independently or as part of a complex system. Manufacturing processes depend on the reliability and availability of electric motors in power plants, refineries, chemical plants, foundries, mills, paper manufacturing plants, transport, etc.

By equipping induction motors with an expert system for condition monitoring and fault detection, the users will get a continuous access to the machine and will be able to detect the most common faults at an early stage of the development.

EMBB Features

» Comprehensive on-line monitoring system for low voltage and high voltage induction motors of all powers and sizes
» Applicable to the motors with squirrel cage and cast cage rotors.
» Modular and upgradeable system for new, as well as for existing, induction motors
» Long-term data storage and important events tracking (trends, waveforms, alarms)
» Local and remote system access

SENSORS:
1 - vibration sensor (bearing)
2 - temperature sensor (bearing)
3 - motor current sensor
4 - magnetic field sensor (air gap)

Operator panel - HMI
(real time data, trends, spectrums, alarms, setup...)

EMCM - Processing/protection unit
(real time processing, data base, web server, HMI, inputs/outputs)

Remote user
(computer, smartphone, tablet...)

Web HMI
(real time data, trends, spectrums, alarms)

Analogue signals

Ethernet
EMCM specification

Architecture:
» Data acquisition unit with the real time controller and local visualization

Inputs:
» Two vibration inputs (IEPE)
» One voltage input (for motor current measurement)
» One voltage input (for magnetic field measurement)
» Two RTD (Pt100) or thermocouple inputs

Digital/relay outputs:
» Number of outputs: 2 to 8
» Continuous current: 6 A
» Maximum switching power: 1500 VA
» Maximum switching voltage: 250 VAC/DC
» Rated isolation voltage: 300 V overload (category III) by EN 50178
» Surge withstand: 4 kV (50 Hz, 1 min)

Communication:
» Ethernet 10/100 Base T(X)
» Supported protocols: Modbus TCP slave, FTP server, IEC 60870-104, HTTP server (other on request)

Power supply:
» DC: 80 V to 370 V
» AC: 85 to 264 V, frequency 47 to 63 Hz
» Integrated 1 second UPS
» Test voltage: 3 kV (2 kV against ground)

Temperature range:
» Operational temperature range: -20°C to +70°C / -0°C to +55°C (for EMCM variant with touch screen)
» Storage temperature range: -40°C to +85°C

Dimensions:
» 19” installation - WHD: 482.5x177.5x250 (typical dimensions)
» Cabinet IP 54 (IP 66 on request) - WHD: 300x300x200

Data visualization:
» Web browser for remote access and local client application through touch screen

Data logging:
» Database for long-term data, alarm and events archival

Standards compliance:
» EMC immunity/emission (EN 61000-6-2/EN 61000-6-4)
» Vibration/shock resistance (EN 60068-2-6/EN 60068-2-27/29)

Based on innovative measurement method (intellectual property of KONČAR - Electrical Engineering Institute Inc.), EMCM enables early detection of the most common faults in induction motors.

Sensors

Accelerometers and velocity sensors
This sensor is used for measurement of absolute bearing vibrations.

Temperature sensors Pt100, RTD, thermocouple
This sensor is used for measurement of bearing temperature.

Magnetic flux/field sensor
This sensor is used for measurement of magnetic field or magnetic flux inside a machine air gap.

Current measuring sensor
This sensor is used for measurement of motor current.

Process value transducers
Different transducers and sensors are used for measurement of important process values of the machine (voltage, flow, pressure...).
EMCM system can receive and process any analog and digital signals from sensor or transducer which features standard voltage or current signal (on request).
Software

Users can get insight into measuring data through local touch display (local HMI) and through web server (web application). Local visualization enables insight into real-time data, waveforms, vibration spectrums, trends and setup. All screens can be modified according to the Customer’s requests which includes native language.

The EMCM system is equipped with a multiuser web server which enables remote access and overview of all system data through standard web browser. This web server provides access to the EMCM system from any desktop or a laptop computer (with Windows or iOS operating system), tablet (with iOS, Android OS...) or smartphone (with iOS, Android OS...).

System access is provided without the need for installation of any additional software, using a standard web browser (Google Chrome, Internet Explorer, Mozilla Firefox, Safari ...). Web server enables insight into real-time data, vibration spectrums, trends, waveforms and alarms for measurement values increase as well as for fault detection.

Documentation

Complete documentation required for system installation, maintenance and usage of the EMCM system.

Usual scope of the documentation:
- Mechanical documentation (book I)
- Electrical documentation (book II)
- User instructions (book III)
- Initial state records (book IV)
- Certificates, test reports... (book V)

Services

Complete services required for system installation, commissioning and usage of the EMCM system.

We offer the following services:
- Consulting services on how to select an optimal monitoring system for new and existing induction motors
- Installation and commissioning
- Staff training
- Expert interpretation of the acquired monitoring results
Contact us for more information!

www.koncar-institut.com
www.koncarmonitoring.com

KONČAR Electrical Engineering Institute, Inc.

mcm@koncar-institut.hr
Fallerovo šetalište 22
10000 Zagreb, Hrvatska