ARTESIS AMT TOOLKIT

Artesis Asset Management Toolkit (AMT)

Description

Artesis AMT Toolkit is a portable motor driven equipment test system which automatically generates a condition assessment report indicating existing faults (both electrical and mechanical), time to failure information, recommended corrective actions, and effects of faults on energy efficiency. This unique instrument is capable of monitoring three phase AC motors and generators (as well as driven equipment) of all sizes and power levels to provide clear, unambiguous indications when the performance of a motor driven equipment begins to degrade. The toolkit uses three current sensors and three voltage sensors, making the system straightforward to install, and use without in-depth training of personnel. The test duration is approximately one hour allowing 5-7 tests to be performed in a day. Report is issued immediately at the end of the test.

AMU UNITS	Asset Management Unit (AMU) measures and processes three-phase motor current and voltage signals to generate an instant condition assessment report. AMU can be used with three-phase AC fixed and variable speed motors, induction motors, synchronous motors, and generators in low, medium or high voltage ranges.
EMC	EMC Directive 2004/108/EC, **EN 61326-1, IEC 61326-1** Measurement Control and Laboratory Use for Industrial Environments
SAFETY	Electrical Safety Directive 2006/95/EC, **EN 61010-1, UL 61010-1, IEC 61010-1** Safety Requirements for Electrical Equipment
COMPUTER	• Netbook with MS Windows 7 OS
CURRENT TRANSFORMERS	• Three split-core multi ratio current transformers 100/5A, 200/5A, 300/5A, and 400/5A, 40mm diameter cable hole • Frequency range 50 / 60 Hz
SOFTWARE	• AES for AMT Software • Instant condition assessment report • PSD download for frequency spectrum analyses • Voltage and current waveform download • Classification of data into companies and motors
FAULT COVERAGE	Loose foundation/components, imbalance/misalignment/coupling, transmission faults, driven equipment faults, bearing faults, rotor faults, stator/insulation faults, voltage imbalance, current imbalance, internal and external electrical faults, and energy efficiency information.
PARAMETERS	RMS values for three phase voltages and currents, frequency, power factor, active power, reactive power, total harmonic distortion, harmonics up to 13th, voltage and current balances
DIMENSION	550x310x190 mm (21.6x12.2x7.5 in)

CONDITION ASSESSMENT REPORT

Equipment Name	P55	**Nominal Voltage**	398 V
Equipment Type	Pump	**Nominal Current**	3 A
Frequency	50 Hz	**Motor Speed**	1500 rpm

☑ **WATCH EXISTING FAULTS** These faults should be checked for verification and corrective action should be taken at the next scheduled maintenance but no later than three (3) months.

Mechanical Fault Indications

☑ Misalignment/imbalance. Check for misalignment, imbalance, bearing, coupling, and motor shaft. ***EEE:*** *Correct shaft alignment ensures the smooth, efficient transmission of power from the motor to the driven equipment.*

☑ Vane/Trans. element/Driven equipment. Check for transmission element(s), coupling, driven equipment, belt, pulley, gear box, and fan/pump impeller. ***EEE:*** *Efficiency is dependent on pulley size, driven torque, under or over belting, and V belt design and construction. Efficiency deteriorates by as much as 5% over time if slippage occurs.*

Electrical Fault Indications

☑ Stator. Check stator for short circuit, winding slackness, isolation faults, and partial discharge. ***EEE:*** *Heating and increased resistance due to stator, rotor and other electrical faults cause deteriorating conditions and reduced efficiency.*

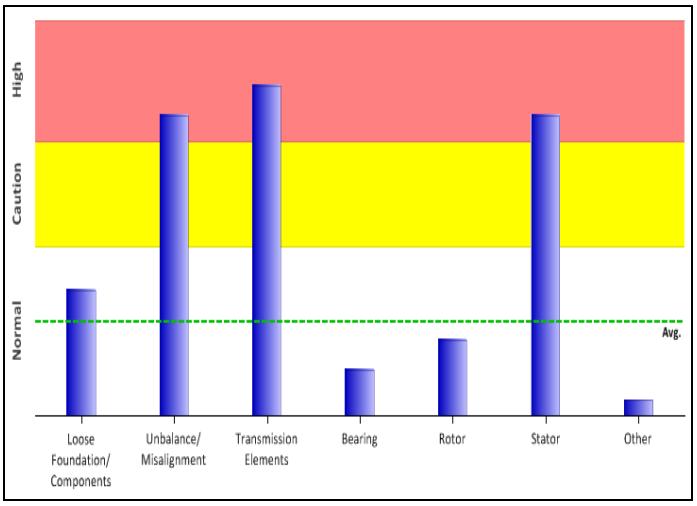
☑ **WATCH ELECTRICAL VALUES** Electrical values are outside of their expected range. They should be noted and watched to identify the cause.

Energy Efficiency

☑ Power factor is below 0.80. If the equipment is working under load then low energy efficiency might have resulted from electrical faults. Monitor the equipment efficiency.

Current and Voltage Imbalances

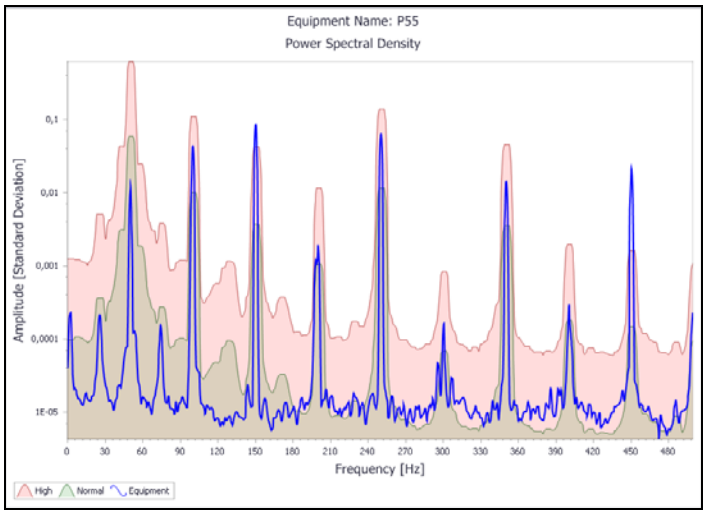
☑ Voltage imbalance exceeds 2%. Voltage imbalance will cause heating and will result in current imbalance. ***EEE:*** *Voltage and current imbalances cause heat and up to 3% loss in energy efficiency.*



Equipment comparison with MCM monitored equipment

Status	Name	Value
Watch	Power Factor	0.60
OK	Active Power [kW]	35
OK	Reactive Power [kVar]	46
OK	Vrms [V]	398
OK	Irms [A]	1.0
Watch	V Imbalance [%]	5.8
OK	I Imbalance [%]	0.12
OK	Frequency [Hz]	50
OK	THD [%]	1.0
OK	3th Harmonic [%]	0.45
OK	5th Harmonic [%]	0.25
OK	7th Harmonic [%]	0.10
OK	9th Harmonic [%]	0.01
OK	11th Harmonic [%]	0.00
OK	13th Harmonic [%]	0.21
WATCH ELECTRICAL VALUES	Electrical values are outside of their expected range. They should be noted and watched to identify the cause.	

Equipment, operation, fault status, and diagnosis



Frequency spectrum

EEE: *Effects on Energy Efficiency*