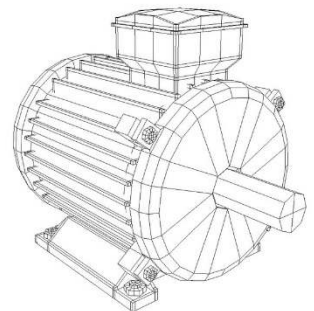
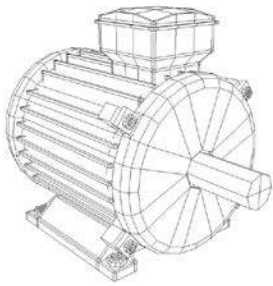


Vibration and Infrared Inspection Report

Prepared for: John Smith, XYZ Company
Prepared by: Nick Engelhardt, Renown Monitoring Services
June 24, 2013
Work Order # 500234





June 24, 2013

XYZ Company

2301 North Park Dr.
Toronto, Ontario
L2L 9H1

Re: Vibration Analysis Report

Dear John Smith,

On June 11th and 21st, 2013 we were onsite to perform vibration analysis of critical equipment located throughout the plant and an Infrared Inspection of electrical equipment. Upon completion of this inspection, we were able to detect and identify **5** anomalies. The results of our inspection contained in this report include spectrum graphs on equipment found to have excessive vibrations, laser alignment data sheets on corrected equipment and infrared thermographs on items displaying abnormally high temperature levels.

We recommend continued monitoring of this equipment to ensure the vibration levels do not increase.

Further to Vibration Analysis, we also provide other predictive maintenance services including:

- Winding Analysis on motors, generators and other wound equipment.
- Infrared Thermal Inspections of electrical systems, buildings and rooftops.
- Oil Analysis.
- Complete motor repair and rewind facilities.
- Onsite Laser Alignments.

Renown Electric Motors & Repairs Inc. would like to thank you for the opportunity to provide these services. If you have any questions regarding the inspection results, or any of the other services we provide, please contact myself or our customer service representatives at (416) 742-3665.

Sincerely,

Nick Engelhardt
Manager, Renown Monitoring Services
Vibration Analyst Cat II ISO 18436-2

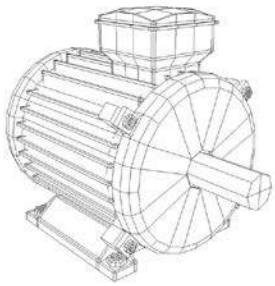
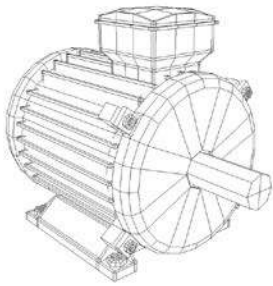


Table of Contents

Vibration Analysis Notes and Observations	4
Equipment List and Severity Chart	5, 6
Vibration Spectrum Graphs	7-9
Corrective Laser Alignment Results	10
Infrared Inspection Notes and Observations	11
Infrared Thermographs	12, 13
About Renown contact info	14



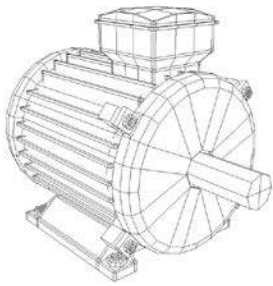
Vibration Analysis Report

NOTES AND OBSERVATIONS

LOCATION	EQUIPMENT	MOTOR	DRVN	COMMENTS
KM-004 Extruder Motor	Elin 110kw 400v 1750rpm s/n 50503604002	2	4	High frequency vibrations and audible noise characteristic of bearing fault. Recommend removal for overhaul.
EEM-01 Drive unit	Siemens 147kw 1185rpm s/n T4115788001001/2005	2	4	Vibration frequencies indicate structural looseness. Recommend increasing rigidity of motor mount.
Elevator Drive # 1	WEG 25hp 575v 1185rpm s/n BC25656	2	4	Vibration frequency indicates coupling misalignment. Recommend corrective laser alignment of motor and gearbox. (alignment performed on June 23, 2013 see page # 10)

REPAIR PRIORITY CODES:

Requires Immediate Attention	1
Requires Corrective Action	2
Developing Problem Monitor Closely	3
OK - Continue to Monitor	4
Machine Not Running/Unable to test	NT



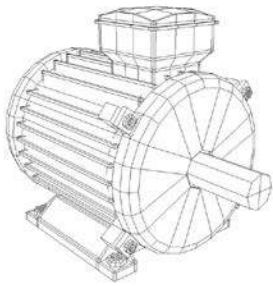
Vibration Analysis Report

SEVERITY CHART

EQUIPMENT	NAMEPLATE	MOTOR	DRVN	COMMENTS
2000t Main Hydraulic Pump	No Nameplate	4	4	Continue to monitor and trend.
2000t Ejector Hydraulic Pump	WEG 50hp 575v 1775rpm s/n BA18849	4	4	Continue to monitor and trend.
2000t Accumulator Hydraulic Pump	Brook Crompton 20hp 575v 1770rpm s/n 3370073	4	4	Continue to monitor and trend.
2000t Extruder A Motor	Emerson 200hp DC 1750rpm s/n 83369-GU	4	4	Continue to monitor and trend.
2000t Extruder A Motor Cooling Fan	No Nameplate	4	4	Continue to monitor and trend.
2000t Extruder B Motor	Unknown DC	4	4	Continue to monitor and trend.
2000t Extruder B Motor Cooling Fan	Unknown	4	4	Continue to monitor and trend.
HP 019 Piercing unit Hydraulic Pump	Unknown	NT	NT	Equipment not in operation at time of testing.
KM-001 Hydraulic Pump	Unknown	4	4	Continue to monitor and trend.
KM-001 Extruder Motor	Unknown	4	4	Continue to monitor and trend.
KM-002 Hydraulic Pump	Unknown	4	4	Continue to monitor and trend.
KM-002 Extruder Motor	Elin 110kw 400v 1744rpm s/n 50530405001	4	4	Continue to monitor and trend.

REPAIR PRIORITY CODES:

Requires Immediate Attention	1
Requires Corrective Action	2
Developing Problem Monitor Closely	3
OK - Continue to Monitor	4
Machine Not Running/Unable to test	NT



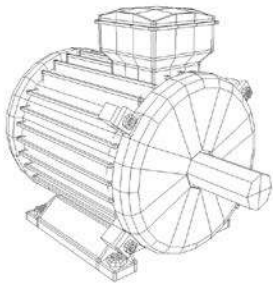
Vibration Analysis Report

SEVERITY CHART

EQUIPMENT	NAMEPLATE	MOTOR	DRVN	COMMENTS
KM-003 Hydraulic Pump	Elin 104kw 480v 1772rpm s/n KM6443985	4	4	Continue to monitor and trend.
KM-003 Extruder Motor	Elin 110kw 400v 1750rpm s/n 50530406001	4	4	Continue to monitor and trend.
KM-004 Hydraulic Pump	Unknown	4	4	Continue to monitor and trend.
KM-004 Extruder Motor	Elin 110kw 400v 1750rpm s/n 50503604002	2	4	High frequency vibrations and audible noise characteristic of bearing fault. Recommend removal for overhaul.
KM-005 Hydraulic Pump	Unknown	4	4	Continue to monitor and trend.
KM-005 Extruder Motor	Elin 110kw 400v 1740rpm s/n 50530405005	4	4	Continue to monitor and trend.
KM-006 Hydraulic Pump	Elin 152kw 575v 1776rpm s/n 505142Z	4	4	Continue to monitor and trend.
KM-006 Extruder Motor	Elin 110kw 400v 1744rpm s/n 50530407001	4	4	Continue to monitor and trend.
KM-007 Hydraulic Pump	Unknown	4	4	Continue to monitor and trend.
KM-007 Extruder Motor	Elin 110kw 400v 1740rpm s/n 50530405003	4	4	Continue to monitor and trend.
Elevator Drive # 1	WEG 25hp 575v 1185rpm s/n BC25656	2	4	Vibration frequency indicates coupling misalignment. Recommend corrective laser alignment of motor and gearbox. (alignment performed on June 23, 2013)
EEM-01 Drive unit	Siemens 147kw 1185rpm s/n T4115788001001/2005	2	4	Vibration frequencies indicate structural looseness. Recommend increasing rigidity of motor mount.

REPAIR PRIORITY CODES:

Requires Immediate Attention	1
Requires Corrective Action	2
Developing Problem Monitor Closely	3
OK - Continue to Monitor	4
Machine Not Running/Unable to test	NT



Vibration Analysis Report

MOTOR SPECTRUM GRAPH

CUSTOMER: XYZ Company	DATE: June 21, 2013
EQUIPMENT: KM-004 Extruder Motor	LOCATION: KM-004

KM-004 Compounding 4 Extruder \NDE Vert\Motor\Spectrum 2013-06-21 11:38:32 AM

v_{rms} [inch/s]

Orders [-]

RPM: 1770 (29.50Hz)

KM-004 Compounding 4 Extruder \NDE Vert\Motor\TimeSignal 2013-06-21 11:38:32 AM

v [inch/s]

t [ms]

RPM: 1770 (29.50Hz)

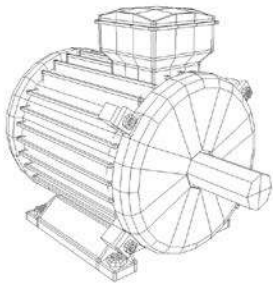
KM-004 Compounding 4 Extruder \NDE Vert\Motor\Accel RMS

a [m/s²]

2013-06-21 11:38:22 AM	2013-06-21 11:38:24 AM	2013-06-21 11:38:26 AM	2013-06-21 11:38:28 AM	2013-06-21 11:38:30 AM	2013-06-21 11:38:32 AM	2013-06-21 11:38:34 AM	2013-06-21 11:38:36 AM	2013-06-21 11:38:38 AM	2013-06-21 11:38:40 AM	2013-06-21 11:38:42 AM
------------------------	------------------------	------------------------	------------------------	------------------------	------------------------	------------------------	------------------------	------------------------	------------------------	------------------------

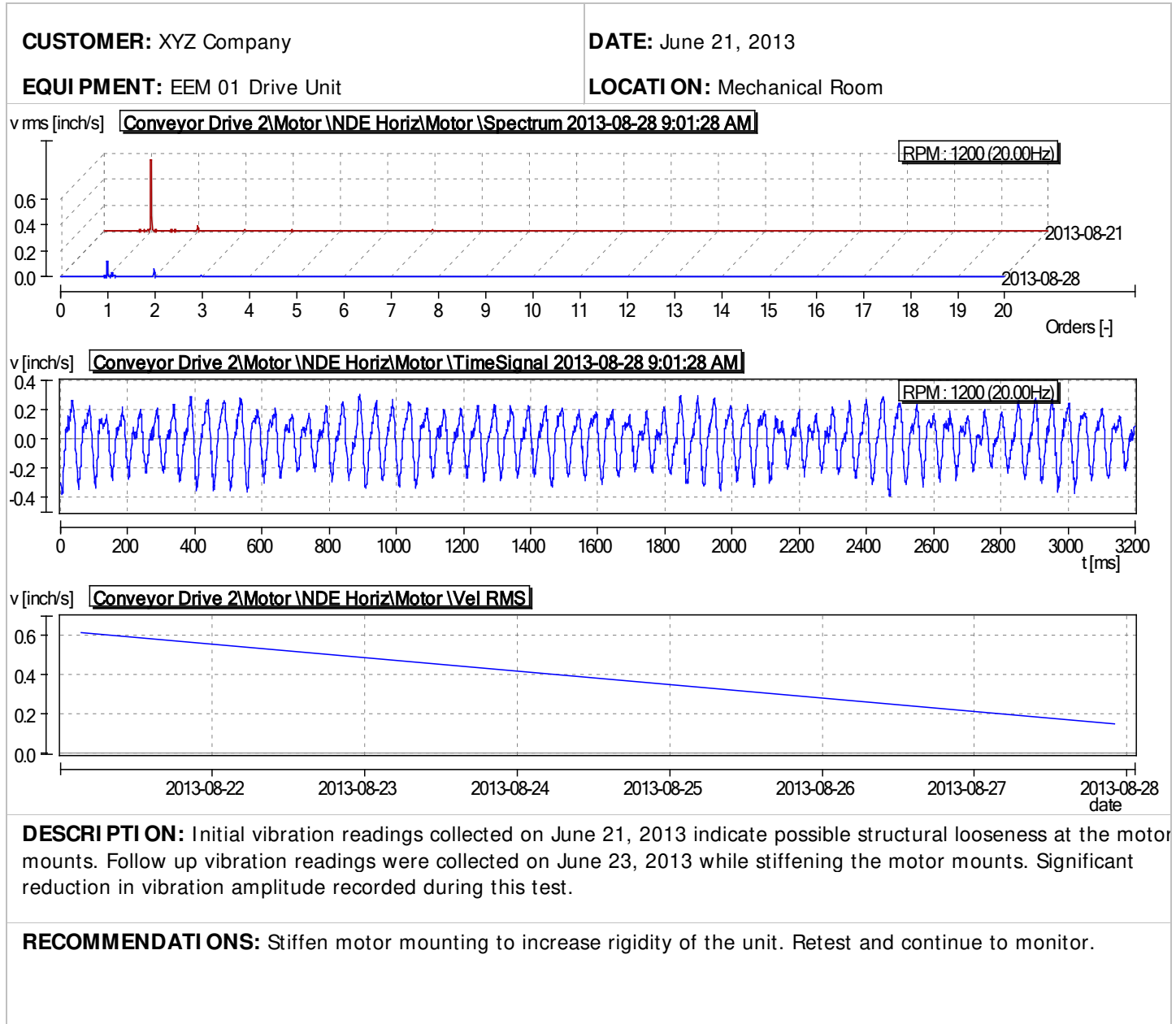
date

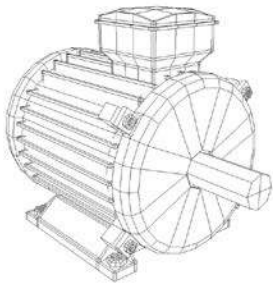
| **DESCRIPTION:** High acceleration detected at motor. Audible noise can be heard. Frequencies characteristic of bearing fault. | |
| **RECOMMENDATIONS:** Remove motor for overhaul. | |



Vibration Analysis Report

MOTOR SPECTRUM GRAPH





Vibration Analysis Report

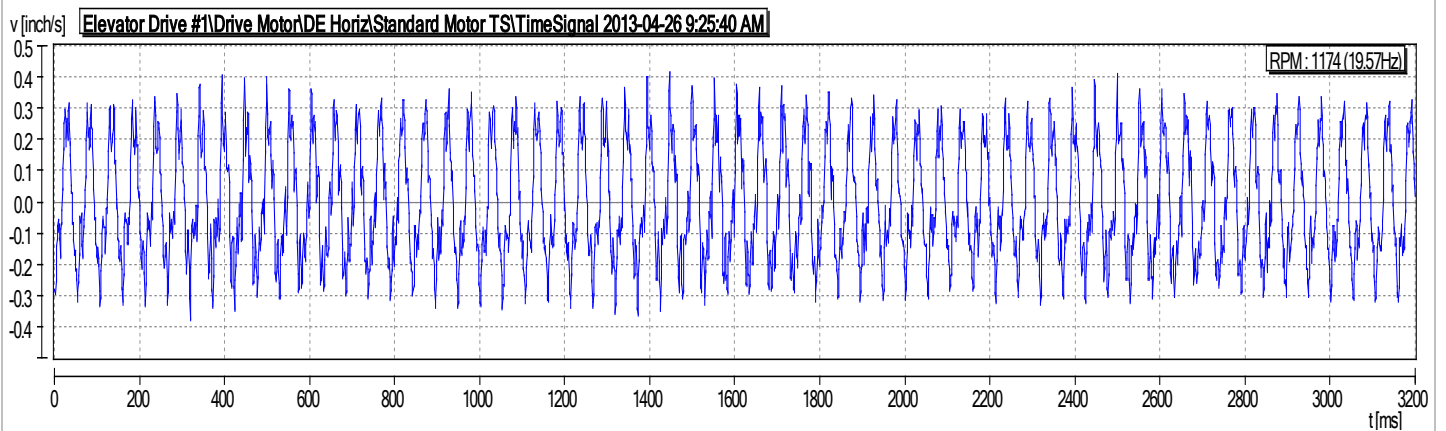
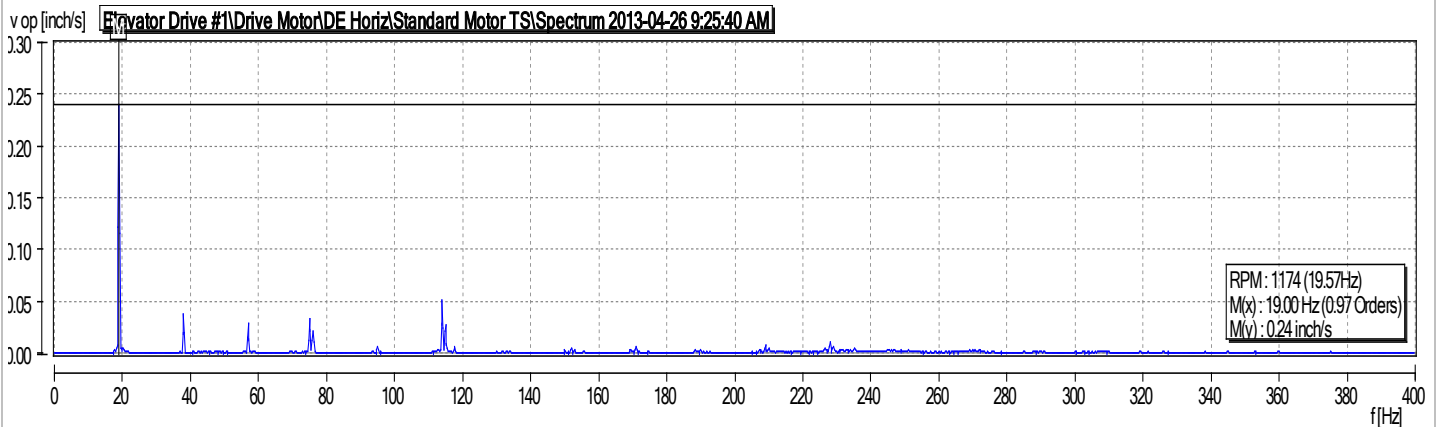
MOTOR SPECTRUM GRAPH

CUSTOMER: XYZ Company

DATE: June 21, 2013

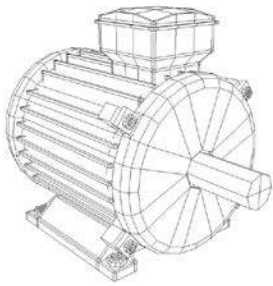
EQUIPMENT: Elevator Drive # 1 - Motor

LOCATION: Mechanical Room



DESCRIPTION: Elevated 1x vibration level detected at drive end of motor indicates possible misalignment at the coupling. Corrective laser alignment performed on June 23, 2013. (see results below)

RECOMMENDATIONS: Continue to monitor.



Vibration Analysis Report

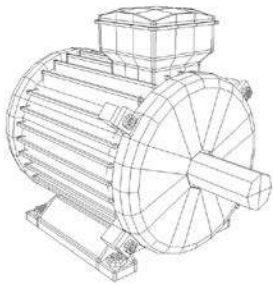
LASER ALIGNMENT RESULTS

CUSTOMER: XYZ Company	DATE: June 23, 2013
EQUIPMENT: Elevator Drive #1 Motor + Gearbox	LOCATION: Mechanical Room

Measured values minus presets		TOL
V	-1.7 thou	0.7 thou
	2.0 thou	4.2 thou
H	-0.4 thou	-0.4 thou
	-0.0 thou	0.5 thou

DESCRIPTION: Machine alignment corrected and machine is within tolerance.

RECOMMENDATIONS: Continue trending to ensure vibration levels do not increase.



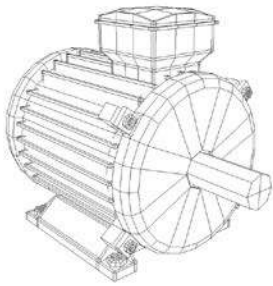
Infrared Inspection Report

NOTES AND OBSERVATIONS

LOCATION	EQUIPMENT	RATING	COMMENTS
Electrical Room	Distribution Panel E Feeder	2	Elevated temperature detected at top fuse. See data sheet for recommendations.
Press P4	Feeder Control Panel	2	Elevated temperature detected at right fuse. See data sheet for recommendations.

REPAIR PRIORITY CODES:

Requires Immediate Attention	1
Requires Corrective Action	2
Developing Problem Monitor Closely	3
OK - Continue to Monitor	4
Machine Not Running/Unable to test	NT



6/21/2013

PROBLEM DESCRIPTION

Elevated temperature detected at top fuse.

RECOMMENDED ACTION

Replace fuse, check connection, tighten, retest and continue to monitor.

Repair Priority Medium

IDENTIFICATION

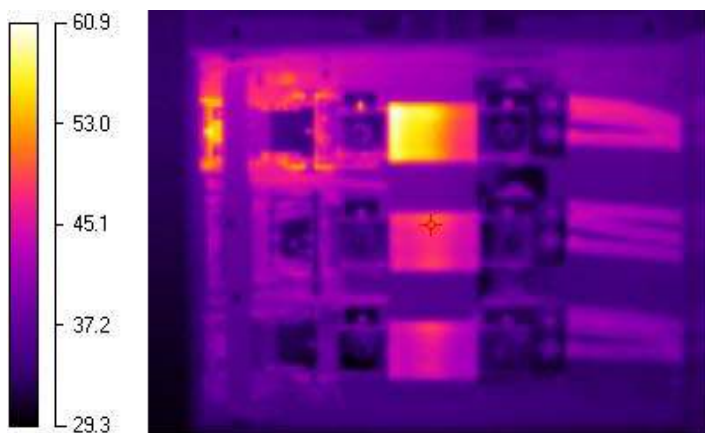
Location Name

Main Electrical Room

Equipment Type

Dist. Panel E Feed

THERMOGRAM

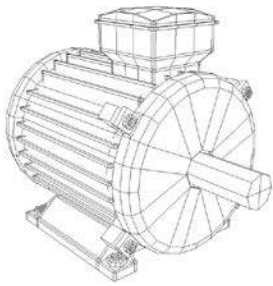


REFERENCE IMAGE



TEMPERATURE MEASUREMENTS

Image Date 5/21/2013 9:13:26 AM
Target Temperature 49.4 °C
Emissivity 0.90
Reflected Temp OFF
Distance 1 Meter



6/21/2013

PROBLEM DESCRIPTION

Elevated temperature detected at right fuse, line side.

RECOMMENDED ACTION

Replace fuse, check connection, tighten, retest and continue to monitor.

Repair Priority Medium

IDENTIFICATION

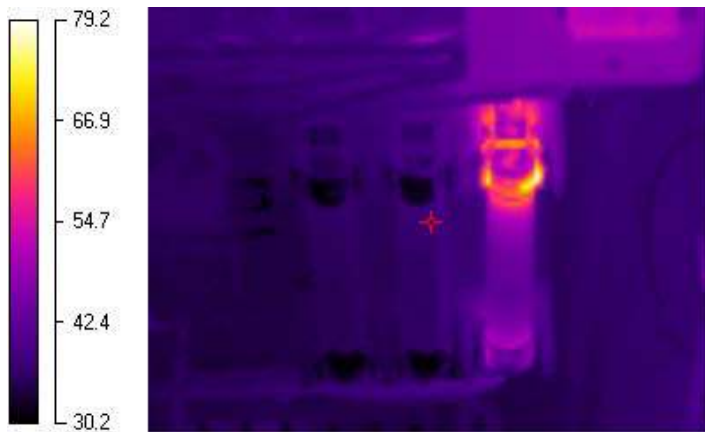
Location Name

Press P4

Equipment Type

Press P4 Feeder Control Panel

THERMOGRAM

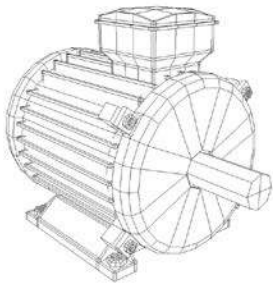


REFERENCE IMAGE



TEMPERATURE MEASUREMENTS

Image Date 5/21/2013 10:07:50 AM
Target Temperature 37.1 °C
Emissivity 0.90
Reflected Temp OFF
Distance 1 Meter



Renown Monitoring Services

About

We are committed to providing the highest quality, results-driven services and products. With over 25 years of experience, Renown proudly offers 24/7/365 service to a wide range of industries, varying in size from start-up companies to Fortune's 500. Our goal is to meet or exceed our customer's needs in the electric motor repair and service industry.

Our modern facilities, located within minutes of the Toronto Airport, has an area of over 25,000 sq. feet (2,322 sq. meters). Available for 24-hour service we have a variety of vehicles for pick-up and delivery; of which three are equipped with booms to handle large motors.

On-Site Services and Repairs

AC & DC Motors of up to 5000 hp

Rewinding & Repairs

Vibration Analysis

Dynamic Balancing

Laser Alignment

Infrared Thermography

New Motor Sales

24 Hour Service

Servo Motor Repairs

NDE | NDT

Winding Analysis

Oil Analysis

Our Location

