HI-SPEED INDUSTRIAL SERVICE QualiTest® Diagnostics

7030 Ryburn Dr. Millington, TN Phone: (901) 873-5300 Fax: (901) 873-5301 www.gohispeed.com

November 22, 2023

Tracy Irving
Bio-Energy Development
Memphis, TN

Tracy,

The following is a summary of findings from the November 2023 vibration survey that was performed on November 14th, 2023.

QualiTest® uses a four step rating system for defects.

CLASS I: Defect is present, but effect on reliability is not clear; no immediate action is required. Continue to normally monitor.

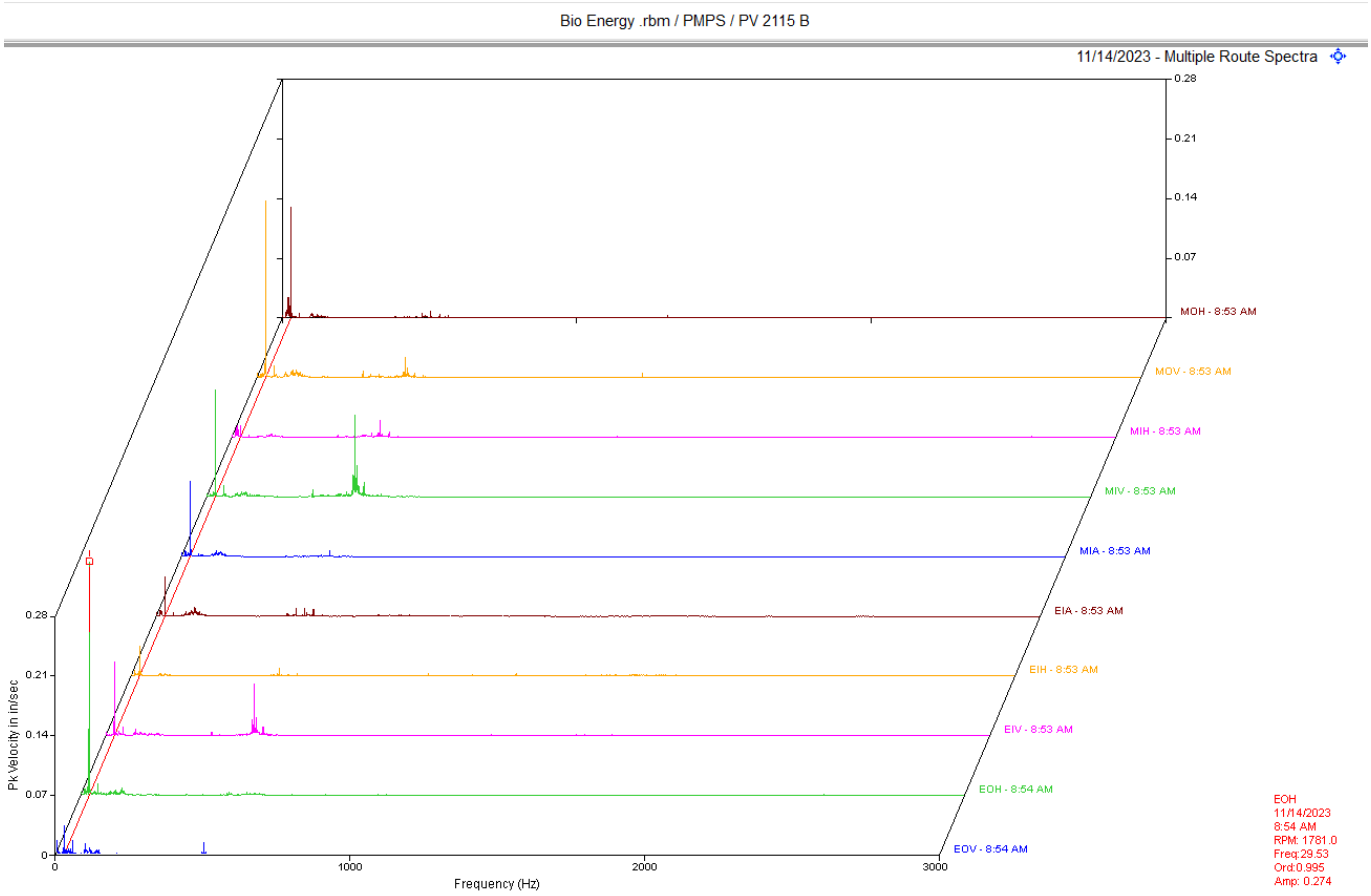
CLASS II: Defect (s) present that may cause problem in long term (2-6 months). Repair during normal maintenance scheduling. Continue to monitor.

CLASS III; Defect (s) present that may cause failure in short term (less than 2 months). This should be addressed as soon as practical, with a high maintenance priority. Increase monitoring frequency.

CLASS IV; Defect (s) present that makes continued reliability unpredictable, and possibility of secondary damage is high. Repairs should be made ASAP. An unscheduled shutdown should be considered for repairs

Defect Summary

PV 2115 B CLASS II



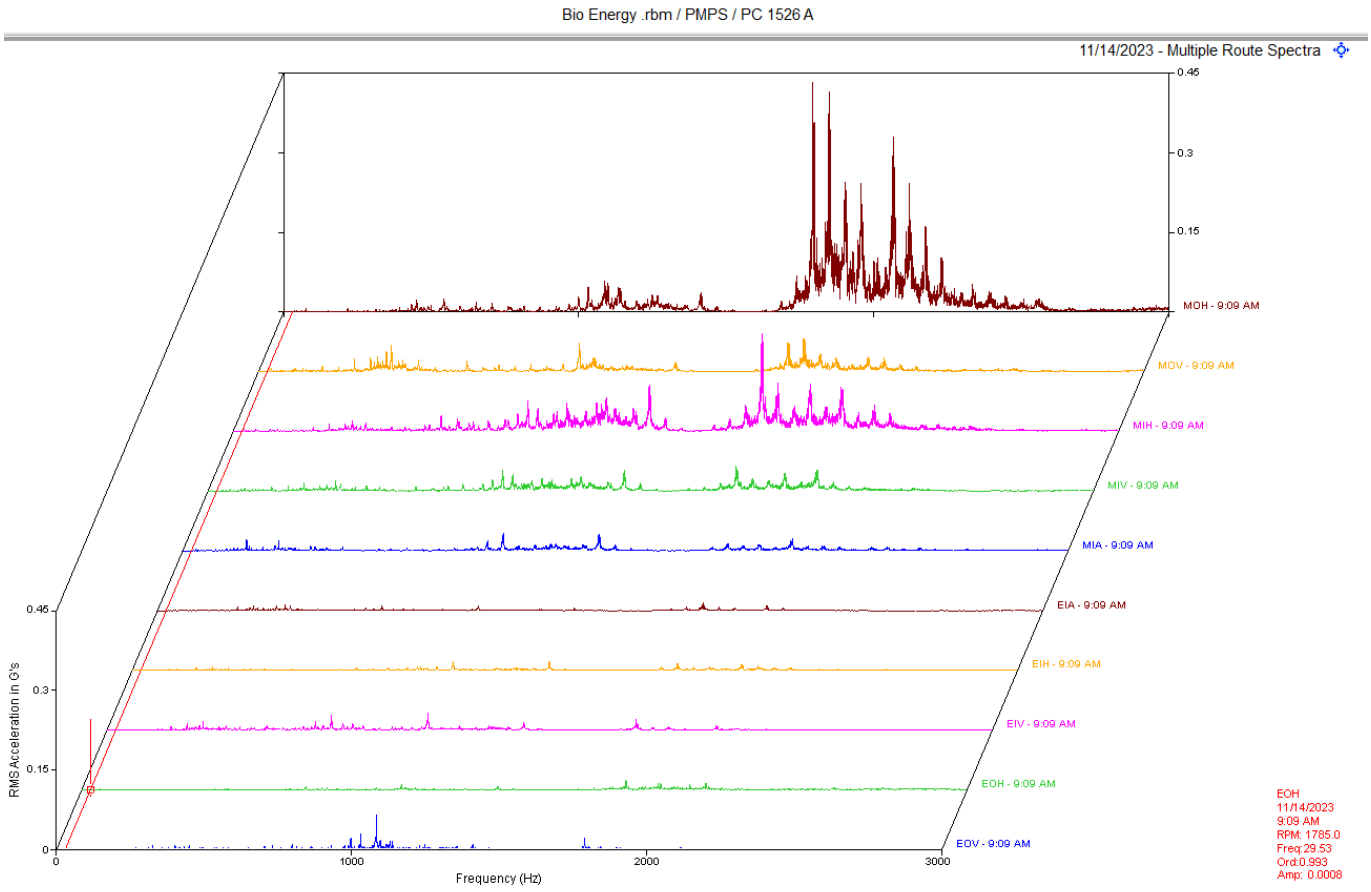
Observation:

Data above is the multi-point spectra of the motor and pump. POH still shows some 1 x rpm vibration. There is a peak near 3 x vane pass also that can be seen in the motor and pump verticals.

Recommendation:

Pump may have impeller issues. Check pump soon We will monitor this closely next survey.

PC 1526A CLASS II



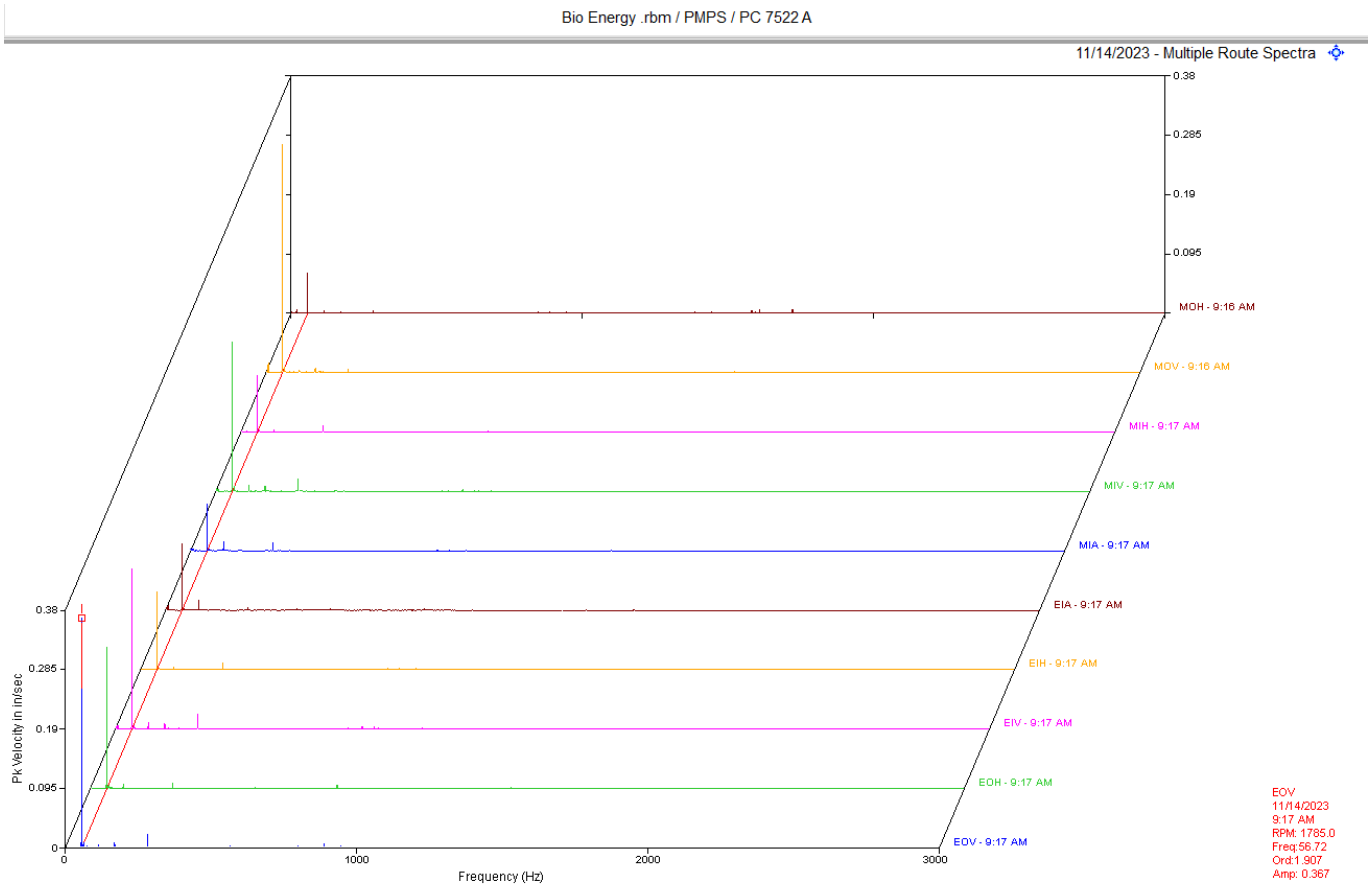
Observation:

Multi-point spectra of the motor and pump shows a significant amount of non-synchronous vibration according to motor data.

Recommendation:

The non-synchronous peaks are very likely race defect frequencies of the motor bearings. This is our first collection of this motor; therefore, severity is unclear. We recommend preparing to swap the motor in the next few months.

PC 7522 A CLASS II



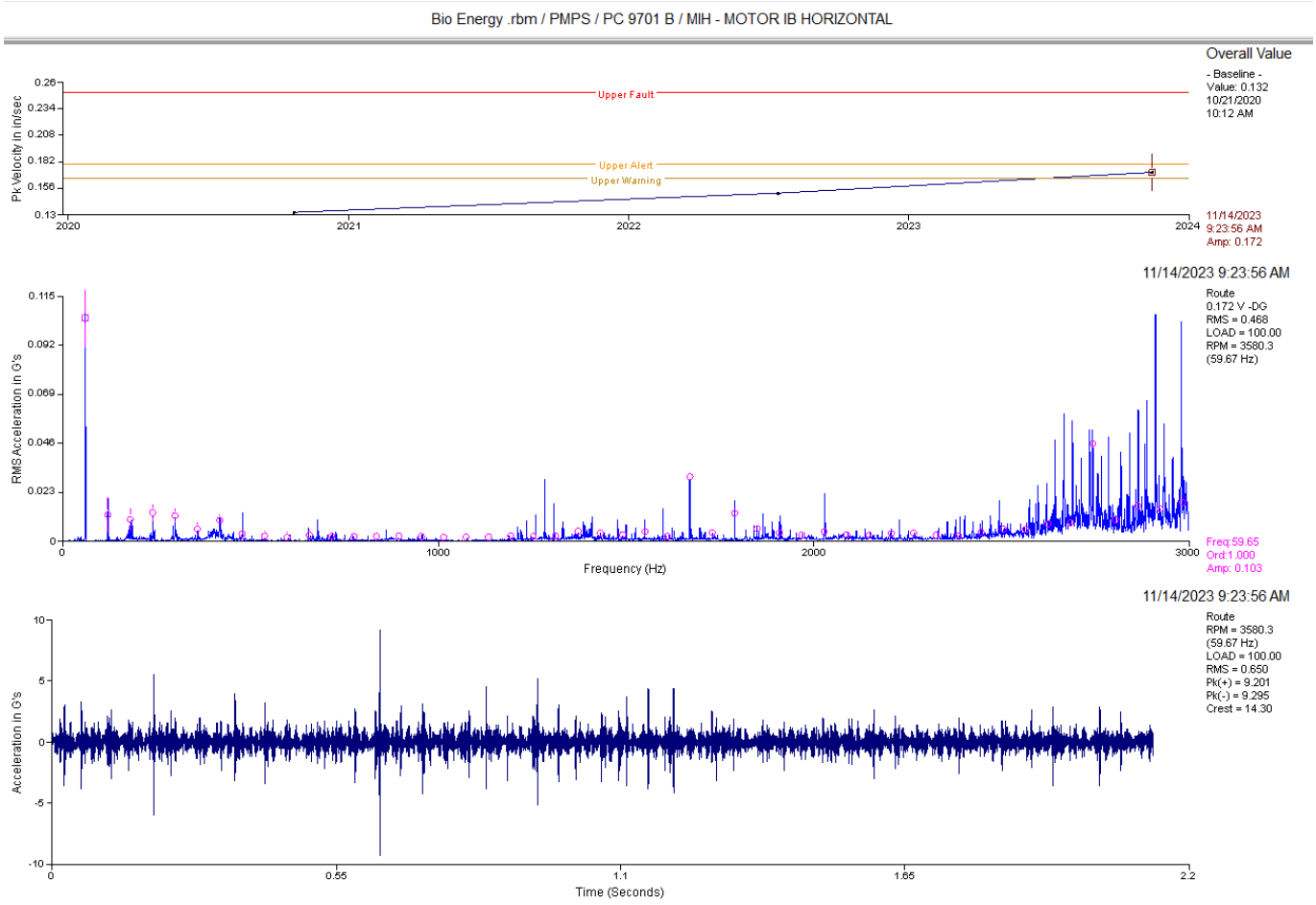
Observation:

Multi-point spectra above are the motor and pump. Data shows a dominant peak at 56.7 Hz. This may be 1 or 2 x rpm. Need to confirm motor RPM.

Recommendation:

Data suggests a possible coupling and or alignment issue. It is recommended to inspect couplings for wear and misalignment and ensure all fasteners are tight. Check shafts for run-out as well.

PC 9701 B CLASS III



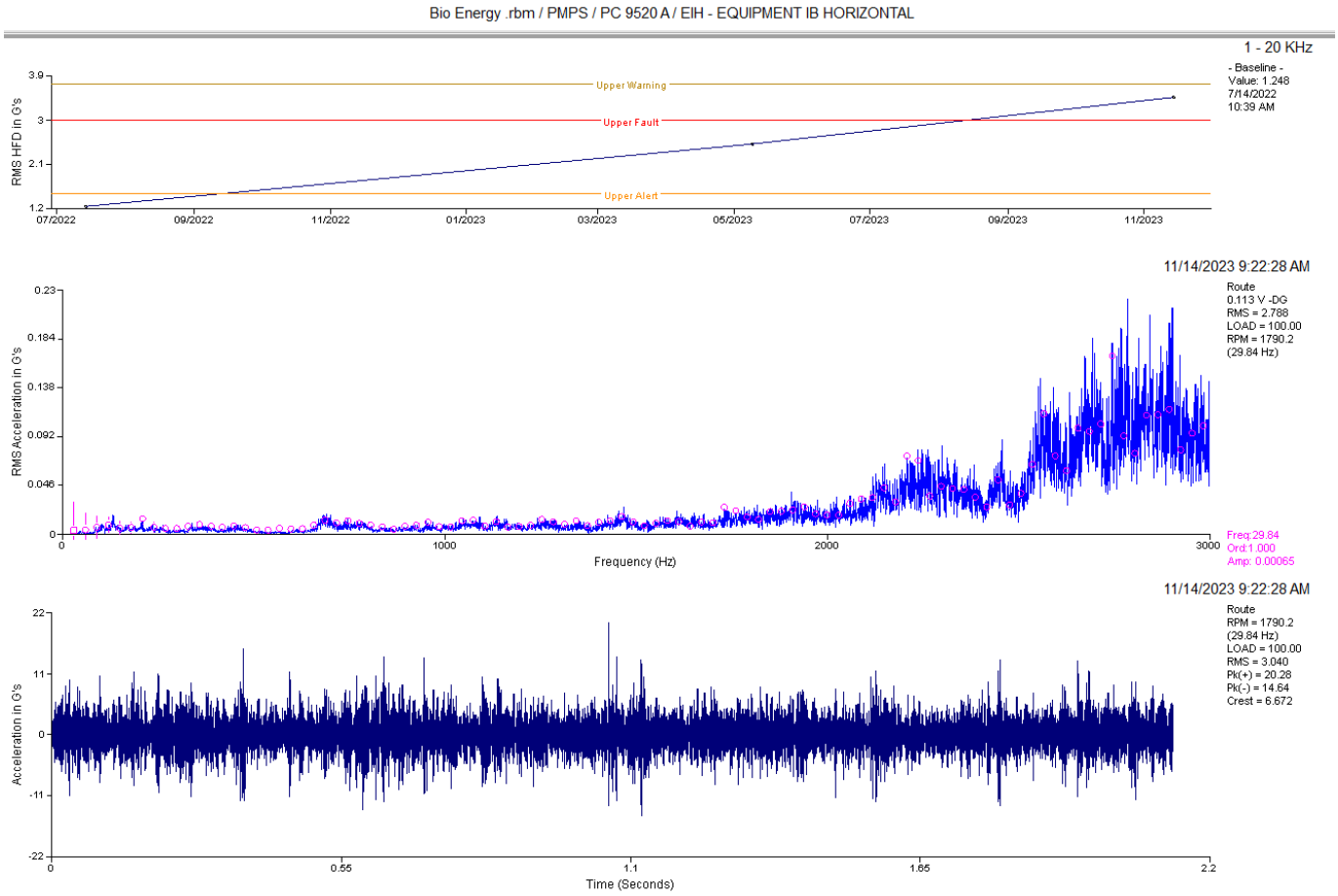
Observation:

Data above is the motor inboard horizontal. Spectral data shows high frequency non-synchronous vibration. Waveform data shows sharp impacts with high peak to peak amplitude. Crest factor is also very high.

Recommendation:

Motor data indicates bearing issues is the motor. Motor will need attention soon.

PC 9520 A CLASS II



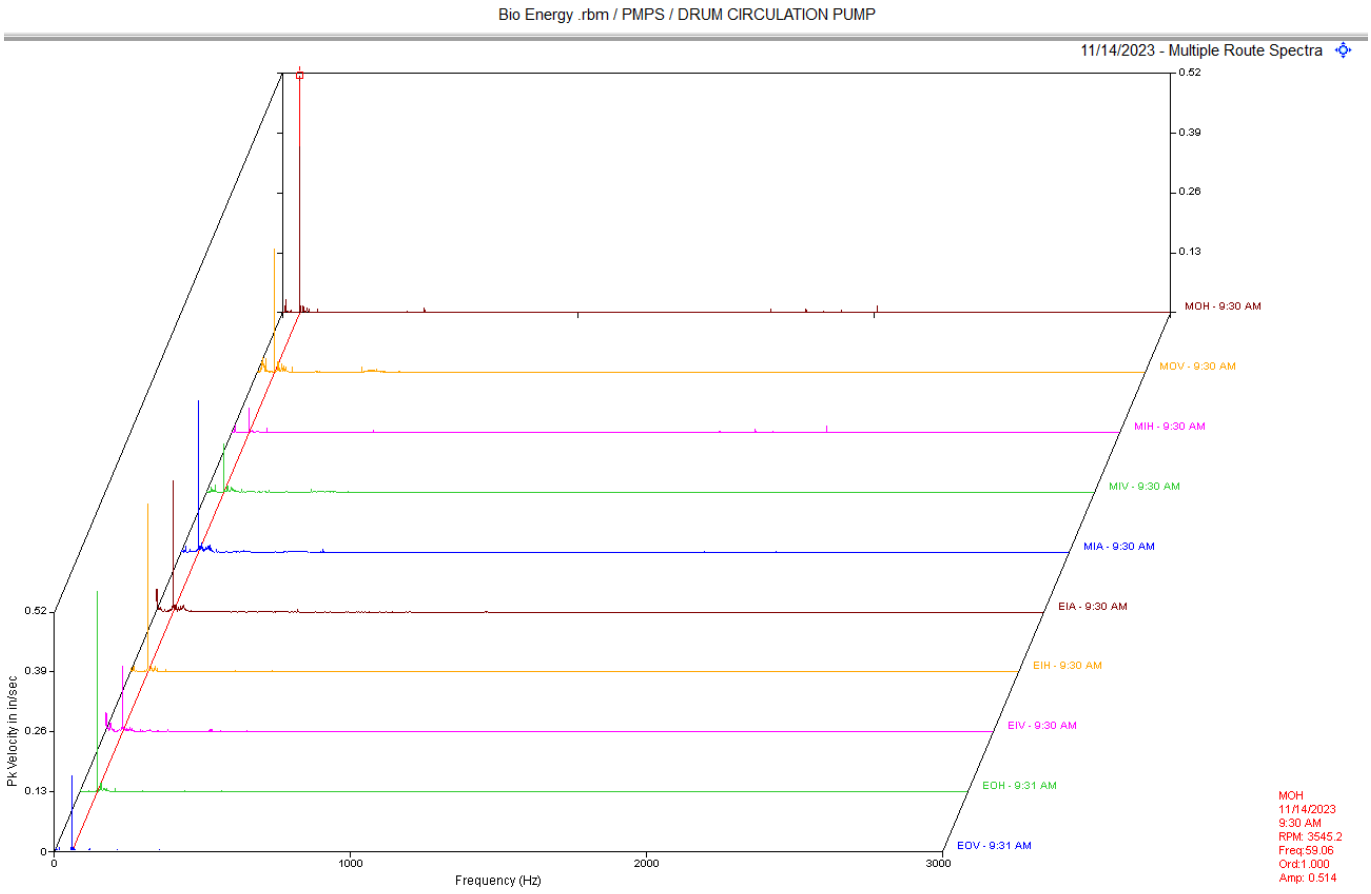
Observation:

Data above is the pump inboard horizontal. Spectral data shows high frequency non-synchronous vibration. Waveform data shows impacting with high peak to peak amplitude.

Recommendation:

Pump data either indicates internal defects are I present in the pump and or pump has significant amounts of cavitation. Inspect pump soon.

Drum Circulation Pump CLASS III



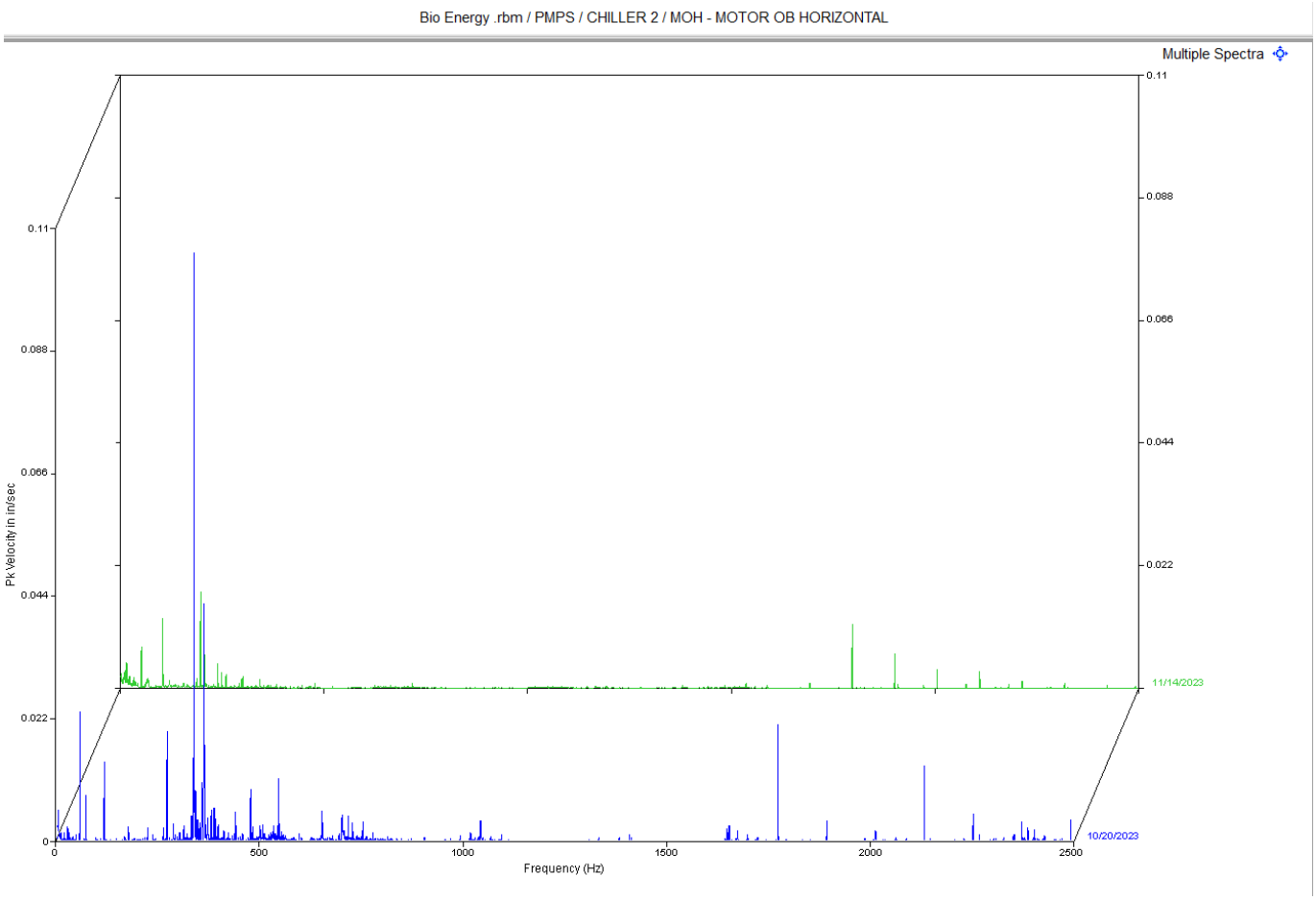
Observation:

Multi-point spectra above are the motor and pump. Data shows a dominant 1 x rpm vibration in motor and pump.

Recommendation:

Data suggests a possible coupling and or alignment issue. It is recommended to inspect couplings for wear and misalignment and ensure all fasteners are tight.

Chiller 2 CLASS I



Observation:

MOH spectral waterfall shows a decrease in the non-synchronous vibration that were present back in October. Blue data is from 10/20/23 and green data is from 11/14/23.

Recommendation:

Motor bearing vibration previously seen as calmed some. We still see some signs of non-synchronous peaks close to BSF, but amplitudes are very low. We will continue to monitor this closely.

Abbreviated Last Measurement Summary

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Database: Bio Energy .rbm
Station: Pumps

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
4125 B - PC 4125 B	(14-Nov-23)	
	OVERALL LEVEL	1 - 20 KHz
MOH	.019 In/Sec	.102 G-s
MOV	.028 In/Sec	.155 G-s
MIH	.023 In/Sec	.119 G-s
MIV	.024 In/Sec	.080 G-s
MIA	.015 In/Sec	.056 G-s
EIA	.030 In/Sec	.094 G-s
EIH	.043 In/Sec	.304 G-s
EIV	.025 In/Sec	.123 G-s
EOH	.032 In/Sec	.334 G-s
EOV	.035 In/Sec	.102 G-s
2106 - PC 2106	(14-Nov-23)	
	OVERALL LEVEL	1 - 20 KHz
MOH	.016 In/Sec	.192 G-s
MOV	.022 In/Sec	.060 G-s
MIH	.019 In/Sec	.272 G-s
MIV	.028 In/Sec	.071 G-s
MIA	.019 In/Sec	.033 G-s
EIA	.028 In/Sec	.072 G-s
EIH	.058 In/Sec	.341 G-s
EIV	.052 In/Sec	.093 G-s
EOH	.047 In/Sec	.366 G-s
EOV	.049 In/Sec	.150 G-s
7210 B - PC 7210 B	(14-Nov-23)	
	OVERALL LEVEL	1 - 20 KHz
MOH	.048 In/Sec	.553 G-s
MOV	.038 In/Sec	.049 G-s
MIH	.051 In/Sec	.247 G-s
MIV	.042 In/Sec	.066 G-s
MIA	.046 In/Sec	.075 G-s
EIA	.076 In/Sec	.398 G-s
EIH	.062 In/Sec	.630 G-s
EIV	.069 In/Sec	.121 G-s
EOH	.077 In/Sec	.502 G-s
EOV	.064 In/Sec	.143 G-s
7245 A - PV 7245 A	(14-Nov-23)	
	OVERALL LEVEL	1 - 20 KHz
MOH	.076 In/Sec	.137 G-s
MOV	.306 In/Sec	.055 G-s
MIH	.093 In/Sec	.111 G-s
MIV	.273 In/Sec	.043 G-s
MIA	.092 In/Sec	.046 G-s
EIA	.088 In/Sec	.559 G-s
EIH	.152 In/Sec	1.262 G-s
EIV	.261 In/Sec	.527 G-s
EOH	.290 In/Sec	1.176 G-s
EOV	.244 In/Sec	.584 G-s
7240 B - PC 7240 B	(14-Nov-23)	
	OVERALL LEVEL	1 - 20 KHz
MOH	.022 In/Sec	.452 G-s
MOV	.034 In/Sec	.118 G-s
MIH	.023 In/Sec	.282 G-s
MIV	.028 In/Sec	.084 G-s

	MIA	.023 In/Sec	.110 G-s
	EIA	.021 In/Sec	.114 G-s
	EIH	.029 In/Sec	.419 G-s
	EIV	.019 In/Sec	.147 G-s
	EOH	.022 In/Sec	.889 G-s
	EOV	.041 In/Sec	.147 G-s

7215 B - PC 7215 B (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.061 In/Sec	.172 G-s
MOV	.073 In/Sec	.045 G-s
MIH	.052 In/Sec	.187 G-s
MIV	.055 In/Sec	.036 G-s
MIA	.026 In/Sec	.015 G-s
EIA	.130 In/Sec	.191 G-s
EIH	.093 In/Sec	.971 G-s
EIV	.103 In/Sec	.172 G-s
EOH	.080 In/Sec	1.062 G-s
EOV	.054 In/Sec	.262 G-s

6110 B - PC 6110 B (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.022 In/Sec	.174 G-s
MOV	.020 In/Sec	.047 G-s
MIH	.020 In/Sec	.246 G-s
MIV	.019 In/Sec	.069 G-s
MIA	.012 In/Sec	.094 G-s
EIA	.029 In/Sec	.034 G-s
EIH	.018 In/Sec	.110 G-s
EIV	.018 In/Sec	.043 G-s
EOH	.016 In/Sec	.097 G-s
EOV	.022 In/Sec	.064 G-s

2105 B - PC 2105 B (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOV	.029 In/Sec	.056 G-s
MIH	.026 In/Sec	.116 G-s
MIV	.026 In/Sec	.035 G-s
MIA	.013 In/Sec	.032 G-s
EIA	.016 In/Sec	.042 G-s
EIH	.026 In/Sec	.149 G-s
EIV	.021 In/Sec	.041 G-s
EOH	.024 In/Sec	.329 G-s
EOV	.034 In/Sec	.045 G-s

2105 A - PC 2105 A (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.054 In/Sec	.955 G-s
MOV	.057 In/Sec	.131 G-s
MIH	.047 In/Sec	2.512 G-s
MIV	.045 In/Sec	.206 G-s
MIA	.026 In/Sec	.614 G-s
EIA	.042 In/Sec	.177 G-s
EIH	.068 In/Sec	.527 G-s
EIV	.053 In/Sec	.174 G-s
EOH	.052 In/Sec	.586 G-s
EOV	.059 In/Sec	.158 G-s

1621 A - PD 1621 A (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.018 In/Sec	.087 G-s
MOV	.024 In/Sec	.036 G-s
MIH	.012 In/Sec	.074 G-s
MIV	.020 In/Sec	.018 G-s
MIA	.024 In/Sec	.028 G-s
EIA	.025 In/Sec	.030 G-s
EIH	.015 In/Sec	.235 G-s
EIV	.018 In/Sec	.029 G-s
EOH	.020 In/Sec	.106 G-s
EOV	.019 In/Sec	.031 G-s

1621 B - PD 1621 B (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.013 In/Sec	.560 G-s
MOV	.016 In/Sec	.075 G-s
MIH	.0081 In/Sec	.417 G-s
MIV	.011 In/Sec	.078 G-s
MIA	.017 In/Sec	.070 G-s
EIA	.018 In/Sec	.062 G-s
EIH	.011 In/Sec	.342 G-s
EIV	.010 In/Sec	.077 G-s
EOH	.012 In/Sec	.114 G-s
EOV	.013 In/Sec	.033 G-s

4410 B - PC 4410 B (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.022 In/Sec	.193 G-s
MOV	.016 In/Sec	.046 G-s
MIH	.023 In/Sec	.114 G-s
MIV	.017 In/Sec	.029 G-s
MIA	.0096 In/Sec	.027 G-s
EIA	.021 In/Sec	.144 G-s
EIH	.022 In/Sec	.440 G-s
EIV	.023 In/Sec	.141 G-s
EOH	.021 In/Sec	.295 G-s
EOV	.025 In/Sec	.067 G-s

2115 B - PV 2115 B (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.150 In/Sec	.220 G-s
MOV	.234 In/Sec	.167 G-s
MIH	.048 In/Sec	.292 G-s
MIV	.195 In/Sec	.039 G-s
MIA	.104 In/Sec	.039 G-s
EIA	.073 In/Sec	.131 G-s
EIH	.056 In/Sec	.600 G-s
EIV	.132 In/Sec	.247 G-s
EOH	.302 In/Sec	.827 G-s
EOV	.090 In/Sec	.094 G-s

7225 A - PC 7225 A (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.128 In/Sec	.172 G-s
MOV	.160 In/Sec	.065 G-s
MIH	.050 In/Sec	.081 G-s
MIV	.074 In/Sec	.023 G-s
MIA	.056 In/Sec	.023 G-s
EIA	.037 In/Sec	.024 G-s
EIH	.040 In/Sec	.087 G-s
EIV	.048 In/Sec	.022 G-s
EOH	.024 In/Sec	.182 G-s
EOV	.034 In/Sec	.020 G-s

2205 A - PC 2205 A (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.033 In/Sec	.791 G-s
MOV	.017 In/Sec	.142 G-s
MIH	.039 In/Sec	.822 G-s
MIV	.023 In/Sec	.090 G-s
MIA	.020 In/Sec	.153 G-s
EIA	.042 In/Sec	.135 G-s
EIH	.042 In/Sec	.305 G-s
EIV	.034 In/Sec	.207 G-s
EOH	.038 In/Sec	.379 G-s
EOV	.038 In/Sec	.245 G-s

2510 B - PV 2510 B (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.142 In/Sec	.084 G-s
MOV	.137 In/Sec	.018 G-s

	MIH	.074 In/Sec	.102 G-s
	MIV	.090 In/Sec	.013 G-s
	MIA	.041 In/Sec	.042 G-s
	EIA	.033 In/Sec	.068 G-s
	EIH	.039 In/Sec	.103 G-s
	EIV	.071 In/Sec	.065 G-s
	EOH	.036 In/Sec	.134 G-s
	EOV	.049 In/Sec	.028 G-s

2301 B - PC 2301 B (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.074 In/Sec	.177 G-s
MOV	.124 In/Sec	.093 G-s
MIH	.032 In/Sec	.119 G-s
MIV	.065 In/Sec	.024 G-s
MIA	.037 In/Sec	.017 G-s
EIA	.035 In/Sec	.042 G-s
EIH	.020 In/Sec	.148 G-s
EIV	.043 In/Sec	.032 G-s
EOH	.018 In/Sec	.129 G-s
EOV	.047 In/Sec	.027 G-s

2310 B - PC 2310 B (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.024 In/Sec	.056 G-s
MOV	.035 In/Sec	.024 G-s
MIH	.030 In/Sec	.035 G-s
MIV	.038 In/Sec	.017 G-s
MIA	.018 In/Sec	.015 G-s
EIA	.040 In/Sec	.070 G-s
EIH	.070 In/Sec	.269 G-s
EIV	.056 In/Sec	.049 G-s
EOH	.040 In/Sec	.106 G-s
EOV	.040 In/Sec	.050 G-s

4110 B - PC 4110 B (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.013 In/Sec	.081 G-s
MOV	.017 In/Sec	.013 G-s
MIH	.014 In/Sec	.098 G-s
MIV	.014 In/Sec	.011 G-s
MIA	.0096 In/Sec	.016 G-s
EIA	.055 In/Sec	.015 G-s
EIH	.050 In/Sec	.062 G-s
EIV	.060 In/Sec	.014 G-s
EOH	.027 In/Sec	.075 G-s
EOV	.032 In/Sec	.025 G-s

5201 B - PC 5201 B (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.031 In/Sec	.902 G-s
MOV	.014 In/Sec	.149 G-s
MIH	.032 In/Sec	1.017 G-s
MIV	.012 In/Sec	.147 G-s
MIA	.015 In/Sec	.298 G-s
EIA	.028 In/Sec	.026 G-s
EIH	.095 In/Sec	.040 G-s
EIV	.047 In/Sec	.017 G-s
EOH	.059 In/Sec	.113 G-s
EOV	.049 In/Sec	.016 G-s

7501 B - PC 7501 B (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.041 In/Sec	.285 G-s
MOV	.031 In/Sec	.060 G-s
MIH	.039 In/Sec	.514 G-s
MIV	.024 In/Sec	.193 G-s
MIA	.015 In/Sec	.173 G-s
EIA	.027 In/Sec	.044 G-s
EIH	.038 In/Sec	.141 G-s

	EIV	.032 In/Sec	.032 G-s
	EOH	.026 In/Sec	.228 G-s
	EOV	.022 In/Sec	.077 G-s

7506 B - PC 7506 B (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.014 In/Sec	.042 G-s
MOV	.011 In/Sec	.0077 G-s
MIH	.013 In/Sec	.062 G-s
MIV	.0092 In/Sec	.0091 G-s
MIA	.0064 In/Sec	.012 G-s
EIA	.0083 In/Sec	.032 G-s
EIH	.0065 In/Sec	.105 G-s
EIV	.0074 In/Sec	.033 G-s
EOH	.0066 In/Sec	.088 G-s
EOV	.0089 In/Sec	.019 G-s

1526 A - PC 1526 A (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.122 In/Sec	2.621 G-s
MOV	.058 In/Sec	.380 G-s
MIH	.075 In/Sec	1.195 G-s
MIV	.053 In/Sec	.355 G-s
MIA	.033 In/Sec	.253 G-s
EIA	.017 In/Sec	.067 G-s
EIH	.015 In/Sec	.109 G-s
EIV	.023 In/Sec	.106 G-s
EOH	.011 In/Sec	.092 G-s
EOV	.018 In/Sec	.147 G-s

9901 B - PC 9901 B (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.037 In/Sec	.343 G-s
MOV	.039 In/Sec	.059 G-s
MIH	.050 In/Sec	.357 G-s
MIV	.039 In/Sec	.090 G-s
MIA	.029 In/Sec	.090 G-s
EIA	.055 In/Sec	.357 G-s
EIH	.103 In/Sec	.939 G-s
EIV	.077 In/Sec	.386 G-s
EOH	.046 In/Sec	.470 G-s
EOV	.052 In/Sec	.091 G-s

4401 B - PC 4401 B (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.012 In/Sec	.036 G-s
MOV	.014 In/Sec	.0059 G-s
MIH	.011 In/Sec	.037 G-s
MIV	.011 In/Sec	.0065 G-s
MIA	.010 In/Sec	.0093 G-s
EIA	.0095 In/Sec	.019 G-s
EIH	.011 In/Sec	.060 G-s
EIV	.011 In/Sec	.010 G-s
EOH	.014 In/Sec	.0071 G-s
EOV	.069 In/Sec	.0024 G-s

4101 A - PC 4101 A (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.032 In/Sec	.116 G-s
MOV	.030 In/Sec	.016 G-s
MIH	.033 In/Sec	.143 G-s
MIV	.028 In/Sec	.019 G-s
MIA	.031 In/Sec	.035 G-s
EIA	.095 In/Sec	.023 G-s
EIH	.065 In/Sec	.058 G-s
EIV	.074 In/Sec	.018 G-s
EOH	.024 In/Sec	.039 G-s
EOV	.069 In/Sec	.0098 G-s

4211 A - PC 4211 A (14-Nov-23)

		OVERALL LEVEL	1 - 20 KHz
	MOH	.028 In/Sec	.156 G-s
	MOV	.027 In/Sec	.032 G-s
	MIH	.024 In/Sec	.138 G-s
	MIV	.021 In/Sec	.021 G-s
	MIA	.011 In/Sec	.042 G-s
	EIA	.047 In/Sec	.034 G-s
	EIH	.034 In/Sec	.124 G-s
	EIV	.026 In/Sec	.048 G-s
	EOH	.039 In/Sec	.162 G-s
	EOV	.032 In/Sec	.026 G-s

7522 A - PC 7522 A (14-Nov-23)

		OVERALL LEVEL	1 - 20 KHz
	MOH	.076 In/Sec	.297 G-s
	MOV	.424 In/Sec	.110 G-s
	MIH	.107 In/Sec	.335 G-s
	MIV	.283 In/Sec	.061 G-s
	MIA	.092 In/Sec	.074 G-s
	EIA	.126 In/Sec	.097 G-s
	EIH	.146 In/Sec	.285 G-s
	EIV	.301 In/Sec	.073 G-s
	EOH	.263 In/Sec	.594 G-s
	EOV	.427 In/Sec	.121 G-s

9520 A - PC 9520 A (14-Nov-23)

		OVERALL LEVEL	1 - 20 KHz
	MOH	.044 In/Sec	.324 G-s
	MOV	.036 In/Sec	.116 G-s
	MIH	.045 In/Sec	.698 G-s
	MIV	.048 In/Sec	.063 G-s
	MIA	.038 In/Sec	.067 G-s
	EIA	.088 In/Sec	.661 G-s
	EIH	.113 In/Sec	3.464 G-s
	EIV	.059 In/Sec	.436 G-s
	EOH	.214 In/Sec	3.165 G-s
	EOV	.157 In/Sec	.854 G-s

9701 B - PC 9701 B (14-Nov-23)

		OVERALL LEVEL	1 - 20 KHz
	MOH	.261 In/Sec	.495 G-s
	MOV	.172 In/Sec	.131 G-s
	MIH	.172 In/Sec	.595 G-s
	MIV	.242 In/Sec	.285 G-s
	MIA	.064 In/Sec	.199 G-s
	EIA	.120 In/Sec	.441 G-s
	EIH	.120 In/Sec	.967 G-s
	EIV	.205 In/Sec	.121 G-s
	EOH	.120 In/Sec	.964 G-s
	EOV	.189 In/Sec	.153 G-s

9621 A - PC 9621 A (14-Nov-23)

		OVERALL LEVEL	1 - 20 KHz
	MOH	.017 In/Sec	.130 G-s
	MOV	.031 In/Sec	.061 G-s
	MIH	.026 In/Sec	.218 G-s
	MIV	.033 In/Sec	.078 G-s
	MIA	.032 In/Sec	.048 G-s
	EIA	.029 In/Sec	.193 G-s
	EIH	.032 In/Sec	.362 G-s
	EIV	.039 In/Sec	.136 G-s
	EOH	.025 In/Sec	.362 G-s
	EOV	.028 In/Sec	.190 G-s

1201 - PC 1201 (14-Nov-23)

		OVERALL LEVEL	1 - 20 KHz
	MOH	.016 In/Sec	.216 G-s
	MOV	.033 In/Sec	.046 G-s
	MIH	.015 In/Sec	.124 G-s
	MIV	.037 In/Sec	.036 G-s

	MIA	.016 In/Sec	.037 G-s
	EIA	.033 In/Sec	.0098 G-s
	EIH	.047 In/Sec	.052 G-s
	EIV	.028 In/Sec	.0091 G-s
	EOH	.053 In/Sec	.053 G-s
	EOV	.034 In/Sec	.032 G-s

1202 - PC 1202 (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.018 In/Sec	.135 G-s
MOV	.027 In/Sec	.025 G-s
MIH	.016 In/Sec	.054 G-s
MIV	.023 In/Sec	.033 G-s
MIA	.017 In/Sec	.019 G-s
EIA	.018 In/Sec	.130 G-s
EIH	.013 In/Sec	.126 G-s
EIV	.020 In/Sec	.047 G-s
EOH	.021 In/Sec	.110 G-s
EOV	.017 In/Sec	.069 G-s

2101 A - PC 2101 A (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.019 In/Sec	.350 G-s
MOV	.017 In/Sec	.195 G-s
MIH	.017 In/Sec	1.118 G-s
MIV	.016 In/Sec	.170 G-s
MIA	.012 In/Sec	.186 G-s
EIA	.0098 In/Sec	.0068 G-s
EIH	.015 In/Sec	.032 G-s
EIV	.0088 In/Sec	.0045 G-s
EOH	.016 In/Sec	.070 G-s
EOV	.010 In/Sec	.023 G-s

1520 B - PC 1520 B (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.049 In/Sec	.713 G-s
MOV	.086 In/Sec	.117 G-s
MIH	.039 In/Sec	.733 G-s
MIV	.035 In/Sec	.185 G-s
MIA	.028 In/Sec	.193 G-s
EIA	.057 In/Sec	.285 G-s
EIH	.037 In/Sec	1.153 G-s
EIV	.028 In/Sec	.660 G-s
EOH	.040 In/Sec	1.396 G-s
EOV	.023 In/Sec	.452 G-s

6501 A - PC 6501 A (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.040 In/Sec	.066 G-s
MOV	.024 In/Sec	.021 G-s
MIH	.040 In/Sec	.103 G-s
MIV	.017 In/Sec	.014 G-s
MIA	.011 In/Sec	.028 G-s
EIA	.022 In/Sec	.018 G-s
EIH	.047 In/Sec	.053 G-s
EIV	.021 In/Sec	.028 G-s
EOH	.036 In/Sec	.046 G-s
EOV	.019 In/Sec	.013 G-s

7252 B - PC 7252 B (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.017 In/Sec	.162 G-s
MOV	.019 In/Sec	.022 G-s
MIH	.017 In/Sec	.246 G-s
MIV	.017 In/Sec	.063 G-s
MIA	.011 In/Sec	.058 G-s
EIA	.021 In/Sec	.115 G-s
EIH	.027 In/Sec	.173 G-s
EIV	.023 In/Sec	.129 G-s
EOH	.021 In/Sec	.069 G-s

	EOV	.042 In/Sec	.019 G-s

1301 B	- PC 1301 B	(14-Nov-23)	
		OVERALL LEVEL	1 - 20 KHz
	MOH	.098 In/Sec	.112 G-s
	MOV	.037 In/Sec	.027 G-s
	MIH	.094 In/Sec	.143 G-s
	MIV	.142 In/Sec	.033 G-s
	MIA	.103 In/Sec	.081 G-s
	EIA	.097 In/Sec	1.379 G-s
	EIH	.063 In/Sec	.486 G-s
	EIV	.064 In/Sec	.742 G-s
	EOH	.048 In/Sec	.592 G-s
	EOV	.040 In/Sec	.328 G-s

4304 B	- PC 4304 B	(14-Nov-23)	
		OVERALL LEVEL	1 - 20 KHz
	MOH	.057 In/Sec	.263 G-s
	MOV	.044 In/Sec	.055 G-s
	MIH	.053 In/Sec	.198 G-s
	MIV	.055 In/Sec	.038 G-s
	MIA	.036 In/Sec	.068 G-s
	EIA	.030 In/Sec	.149 G-s
	EIH	.028 In/Sec	.187 G-s
	EIV	.028 In/Sec	.128 G-s
	EOH	.025 In/Sec	.152 G-s
	EOV	.087 In/Sec	.060 G-s

1430 A	- PC 1430 A	(14-Nov-23)	
		OVERALL LEVEL	1 - 20 KHz
	MOH	.064 In/Sec	.248 G-s
	MOV	.044 In/Sec	.060 G-s
	MIH	.052 In/Sec	.220 G-s
	MIV	.054 In/Sec	.062 G-s
	MIA	.026 In/Sec	.050 G-s
	EIA	.023 In/Sec	.049 G-s
	EIH	.053 In/Sec	.200 G-s
	EIV	.051 In/Sec	.063 G-s
	EOH	.055 In/Sec	.147 G-s
	EOV	.075 In/Sec	.027 G-s

1425 A	- PC 1425 A	(14-Nov-23)	
		OVERALL LEVEL	1 - 20 KHz
	MOH	.068 In/Sec	.215 G-s
	MOV	.118 In/Sec	.055 G-s
	MIH	.039 In/Sec	.201 G-s
	MIV	.092 In/Sec	.031 G-s
	MIA	.046 In/Sec	.038 G-s
	EIA	.050 In/Sec	.086 G-s
	EIH	.051 In/Sec	.327 G-s
	EIV	.097 In/Sec	.053 G-s
	EOH	.090 In/Sec	.264 G-s
	EOV	.101 In/Sec	.082 G-s

7101 B	- PC 7101 B	(14-Nov-23)	
		OVERALL LEVEL	1 - 20 KHz
	MOH	.081 In/Sec	.117 G-s
	MOV	.105 In/Sec	.047 G-s
	MIH	.069 In/Sec	.151 G-s
	MIV	.084 In/Sec	.022 G-s
	MIA	.063 In/Sec	.036 G-s
	EIA	.049 In/Sec	.165 G-s
	EIH	.054 In/Sec	.541 G-s
	EIV	.050 In/Sec	.192 G-s
	EOH	.046 In/Sec	.545 G-s
	EOV	.041 In/Sec	.189 G-s

INFLUENT	- DAF INFULENT	(14-Nov-23)	
		OVERALL LEVEL	1 - 20 KHz
	MOH	.089 In/Sec	.112 G-s

	MOV	.049 In/Sec	.167 G-s
	MIH	.068 In/Sec	.109 G-s
	MIV	.041 In/Sec	.035 G-s
	MIA	.048 In/Sec	.016 G-s
	EIA	.052 In/Sec	.020 G-s
	EIH	.060 In/Sec	.038 G-s
	EIV	.074 In/Sec	.024 G-s
	EOH	.075 In/Sec	.0034 G-s
	EOV	.077 In/Sec	.0019 G-s

CIRC PUMP - DRUM CIRCULATION PUMP (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.564 In/Sec	.486 G-s
MOV	.315 In/Sec	.055 G-s
MIH	.068 In/Sec	.452 G-s
MIV	.128 In/Sec	.023 G-s
MIA	.368 In/Sec	.109 G-s
EIA	.334 In/Sec	.030 G-s
EIH	.406 In/Sec	.060 G-s
EIV	.194 In/Sec	.019 G-s
EOH	.486 In/Sec	.070 G-s
EOV	.191 In/Sec	.022 G-s

EFFULENT - DAF EFFULENT (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.107 In/Sec	.395 G-s
MOV	.117 In/Sec	.151 G-s
MIH	.379 In/Sec	.252 G-s
MIV	.271 In/Sec	.276 G-s
MIA	.302 In/Sec	.288 G-s
EIA	.168 In/Sec	.226 G-s
EIH	.128 In/Sec	.279 G-s
EIV	.161 In/Sec	.257 G-s
EOH	.160 In/Sec	.180 G-s
EOV	.119 In/Sec	.142 G-s

CHILLER2 - CHILLER 2 (14-Nov-23)

	OVERALL LEVEL	1 - 20 KHz
MOH	.033 In/Sec	.637 G-s
MOV	.080 In/Sec	.520 G-s
MIH	.036 In/Sec	.690 G-s
MIV	.018 In/Sec	.206 G-s
MIA	.021 In/Sec	.306 G-s
EIA	.027 In/Sec	.112 G-s
EIH	.039 In/Sec	.795 G-s
EIV	.028 In/Sec	.255 G-s
EOH	.049 In/Sec	.219 G-s
EOV	.024 In/Sec	.082 G-s
EOA	.030 In/Sec	.093 G-s

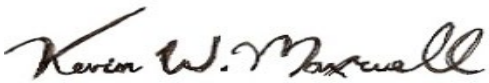
Clarification Of Vibration Units:

Acc --> G-s RMS

Vel --> In/Sec PK

As always, it has been a pleasure to serve Bio-Energy Memphis, TN. If there are any comments or questions, do not hesitate to contact us.

Sincerely,



ISO Certified Vibration Analyst, Category III

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QualiTest® Diagnostics

Cell: 901-486-4565
Email: kwilliam@gohispeed.com