

Support Capabilities & Facilities – Gas Turbine Aerodynamics & Combustion

The Gas Turbine Laboratory (GTL) of the NRC Institute for Aerospace Research (NRC Aerospace) possesses a broad spectrum of air moving facilities that are capable of supplying either heated or cooled air to a number of test rigs and test cells via common piping manifolds. This fact sheet documents these facilities and their capabilities.

Table 1

Air Moving Facilities	Air Flow	Maximum Pressure
	lb/s	psia
CMP 1	7	315
CMP 2	7	315
CMP 3	32.5	315
M5A 1 Compressor	5	300
M5A 2 Compressors	10	300
2 MW BB	10	2
5 MW BB	27	105

Table 1 summarizes the air moving facilities at NRC Aerospace. CMPs 1 through 3 are new, integrally geared compressors, that can be operated either individually or ganged in parallel to yield a total combined output of 46.5 lb/s. The M5A compressors can be run individually or in parallel and, if necessary, can be ganged with the three CMPs to give a combined mass flow of 56.5 lb/s. In this configuration the maximum pressure is limited to 300 psia. The 2 MW BB facility can only be used as an ‘exhauster’ while the 5 MW BB facility can be used as an ‘exhauster’ or a compressor.



The GTL management system has been registered to ISO 9001:2000



Compressors CMP1 and CMP2

Table 2

Air Heating Facilities	Air Flow	Pressure	Temperature
	lb/s	psia	°F
CMP 1	7	315	1200
CMP 2	7	315	1200
CMP 3	32.5	315	1200

Table 2 summarizes the air heating facilities at NRC Aerospace. The M10-B air heater is dedicated to a small combustion test cell (Rm 184) located in building M10-B. The two M10-F air heaters are capable of supplying either of two test cells located in building M10-F. These heaters can be run individually or in parallel and, although rated for 20 lb/s each, they can handle additional mass flow but the maximum delivery temperature decreases.

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Combustion or combustion-related test cells

NRC Aerospace has five test cells for combustion or combustion-related tests:

- M10-B 172
- M10-B 174
- M10-B 184
- M10-F STC
- M10-F LTC

Table 3

	Pressure	Mass Flow
	lb/s	psia
Natural Gas Compressor	565 @ 120 8F	5400
High Pressure Steam Plant	0 → 315	0 → 5000

Table 3 summarizes the performance capabilities and rental rates for additional support facilities at NRC Aerospace. The natural gas compressor only services the two combustion test cells in building M-10F.

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