Construction of a Central Database for Compressor Applications

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Motivation

- ❑ Compressor Data is reported in a variety of formats
- ❑ Difficult to compare data about different compressors, especially across company lines
- ❑ Complicates the job of selecting the best compressor for an application

Project Objectives

- ❑ Create a comprehensive, central database of compressor information
- ❑ Provide a common storehouse and format for experimental data concerned with compressors
- ❑ Deliver a user-friendly platform for storing and accessing data

Outcomes/Deliverables

- ❑ Working Database populated with compressor data
- ❑ Intuitive user interface to allow users to easily enter, search, and compare compressor data

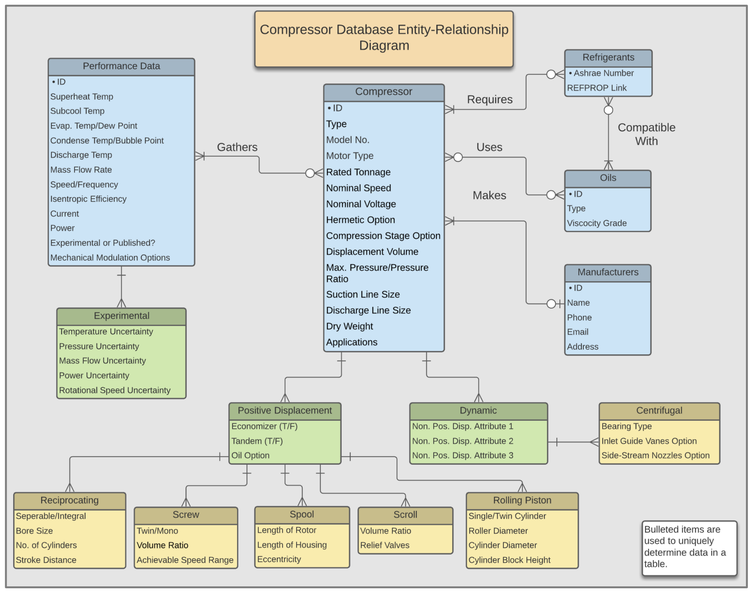
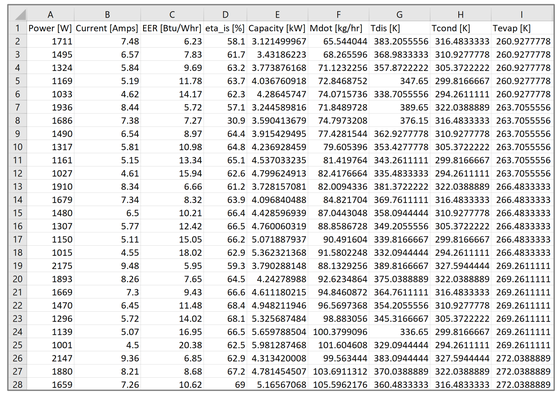


Figure 1: Database Schematic

Database Creation

- ❑ Database of Choice: MongoDB
  - Flexible data schema options
  - Related information is stored together
- ❑ Interface Language: Python
  - Very well-known
  - Simple to learn
  - Existing interface with MongoDB
- ❑ Initial Data: Air-Conditioning, Heating, and Refrigeration Institute Papers
  - Multitude of reporting formats
  - Used to create a common data format
  - Great for testing data insertion and update methods



	A	B	C	D	E	F	G	H	I
1	Power [W]	Current [Amps]	EER [Btu/Whr]	eta_is [%]	Capacity [kW]	Mdot [kg/hr]	Tdis [K]	Tcond [K]	Tevap [K]
2	1711	7.48	6.23	58.1	3.121499967	65.544044	383.2055556	316.4833333	260.9277778
3	1495	6.57	7.83	61.7	3.43186223	68.265596	368.9833333	310.9277778	260.9277778
4	1324	5.84	9.69	63.2	3.773876168	71.1232256	357.8722222	305.3722222	260.9277778
5	1169	5.19	11.78	63.7	4.036760918	72.8468752	347.65	299.8166667	260.9277778
6	1033	4.62	14.17	62.3	4.28645747	74.0715736	338.7055556	294.2611111	260.9277778
7	1936	8.44	5.72	57.1	3.244589816	71.8489728	389.65	322.0388889	263.7055556
8	1686	7.38	7.27	30.9	3.590413679	74.7973208	376.15	316.4833333	263.7055556
9	1490	6.54	8.97	64.4	3.915429495	77.4281544	362.9277778	310.9277778	263.7055556
10	1317	5.81	10.98	64.8	4.236928459	79.605396	353.4277778	305.3722222	263.7055556
11	1161	5.15	13.34	65.1	4.537033235	81.419764	343.2611111	299.8166667	263.7055556
12	1027	4.61	15.94	62.6	4.799624913	82.4176664	335.4833333	294.2611111	263.7055556
13	1910	8.34	6.66	61.2	3.728157081	82.0094336	381.3722222	322.0388889	266.4833333
14	1679	7.34	8.32	63.9	4.096840488	84.821704	369.7611111	316.4833333	266.4833333
15	1480	6.5	10.21	66.4	4.428596939	87.0443048	358.0944444	310.9277778	266.4833333
16	1307	5.77	12.42	66.5	4.760060319	88.8586728	349.2055556	305.3722222	266.4833333
17	1150	5.11	15.05	66.2	5.071887937	90.491604	339.8166667	299.8166667	266.4833333
18	1015	4.55	18.02	62.9	5.362321368	91.5802248	332.0944444	294.2611111	266.4833333
19	2175	9.48	5.95	59.3	3.790288148	88.1329256	389.8166667	327.5944444	269.2611111
20	1893	8.26	7.65	64.5	4.24278988	92.6234864	375.0388889	322.0388889	269.2611111
21	1669	7.3	9.43	66.6	4.611180215	94.8460872	364.7611111	316.4833333	269.2611111
22	1470	6.45	11.48	68.4	4.948211946	96.5697368	354.2055556	310.9277778	269.2611111
23	1296	5.72	14.02	68.1	5.325687484	98.883056	345.3166667	305.3722222	269.2611111
24	1139	5.07	16.95	66.5	5.659788504	100.3799096	336.65	299.8166667	269.2611111
25	1001	4.5	20.38	62.5	5.981287468	101.604608	329.0944444	294.2611111	269.2611111
26	2147	9.36	6.85	62.9	4.313420008	99.563444	383.0944444	327.5944444	272.0388889
27	1880	8.21	8.68	67.2	4.781454507	103.6911312	370.0388889	322.0388889	272.0388889
28	1659	7.26	10.62	69	5.16567068	105.5962176	360.4833333	316.4833333	272.0388889

Figure 2: MongoDB Data Schema with Expanded Experimental Data

User Interface for Data Entry

- ❑ Existing Compressor
  - Compressor selected from list in Database
  - Performance Data entered as Excel file
- ❑ New Compressor
  - Compressor template entered as text file
  - Performance Data entered as Excel file

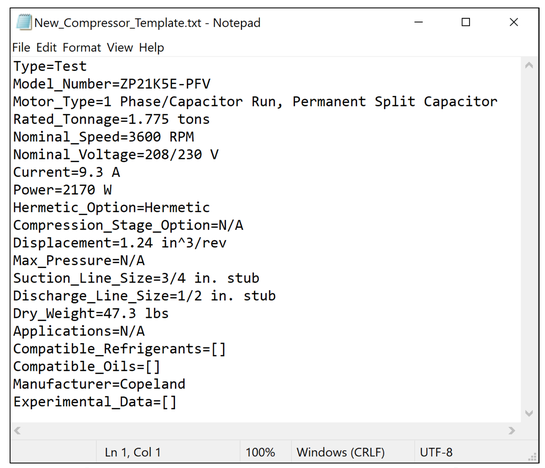


Figure 3: New Compressor Template

Future Goals

- ❑ Populate Database with more information
- ❑ Create graphical user interface for viewing data
  - Point-and-click based
  - Filter data based on compressor characteristics
- ❑ Add additional data transformation methods
- ❑ Create Python methods to successfully scan PDFs into Excel files with the correct data format
- ❑ Add Python methods for validating data added to the database

mongoDB®

Figure 4: MongoDB Logo

Acknowledgements

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