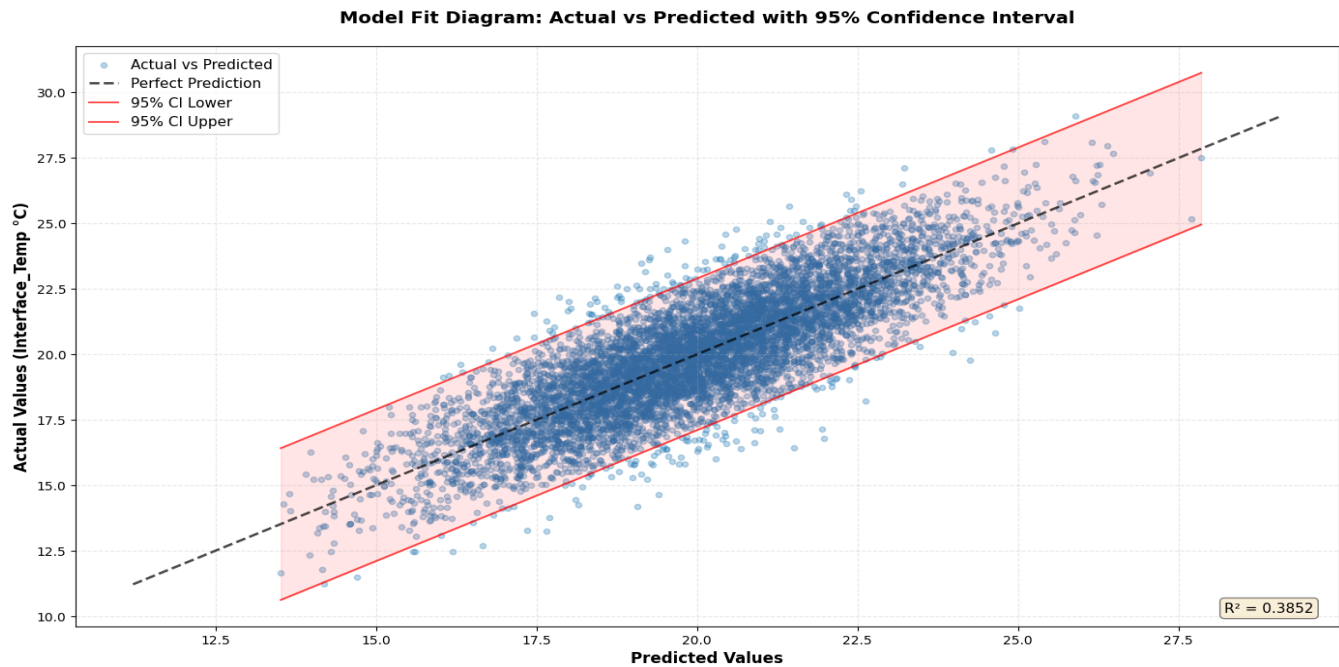# Full DOE Model: Comprehensive Analysis

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1. Model Fit Diagram with 95% Confidence Interval

Actual vs Predicted scatter plot with 95% confidence interval bands. Shows the full model's prediction accuracy across the predictor space.

2. Full Model Summary Statistics

Metric	Value
R-squared	0.3897
Adjusted R-squared	0.3718
F-statistic	21.72
Prob (F-statistic)	<0.001
Residual Std Error	1.3208
Degrees of Freedom	7382
Number of Observations	7600
Total Parameters	820

3. ANOVA Table (Type I - Sequential)

Source	DF	Sum of Squares	Mean Square	F-stat	p-value
Transceiver Mfr	9	3416.87	379.65	217.73	<0.001
Rack Unit	40	420.47	10.51	6.01	<0.001
Fan Speed Range	1	1.65	1.65	0.95	0.331
Mfr × Rack Unit	360	4773.00	13.26	7.57	<0.001
Rack Unit × Fan Speed	40	82.57	2.06	1.18	0.200
Main Effects & 3-way+	370	125.45	0.34	0.19	0.999
Residual	7382	12871.69	1.743	N/A	N/A

4. Top 50 Parameters Sorted by p-value

The following table shows the 50 most significant parameters from the full model, sorted from lowest to highest p-value. A lower p-value indicates greater statistical significance.

Parameter	Coefficient	t-value	p-value	Significance
6.508726e+01	6.5087e+01	812.66	<0.001	***
6.514938e+01	6.5149e+01	46.06	<0.001	***
-1.332634e+00	-1.3326e+00	-11.37	<0.001	***
-1.327588e+00	-1.3276e+00	-9.95	<0.001	***
-2.830278e+00	-2.8303e+00	-5.98	<0.001	***
-1.245049e+00	-1.2450e+00	-4.67	<0.001	***
-2.493208e+00	-2.4932e+00	-4.57	<0.001	***
-1.723358e+00	-1.7234e+00	-4.24	<0.001	***
-8.034105e-01	-8.0341e-01	-3.38	<0.001	***
-2.216127e+00	-2.2161e+00	-3.33	<0.001	***
-2.493841e+00	-2.4938e+00	-3.25	1.15e-03	**
-5.594260e-01	-5.5943e-01	-3.18	1.49e-03	**
4.439999e+00	4.4400e+00	3.17	1.52e-03	**
-2.316164e+00	-2.3162e+00	-3.02	2.52e-03	**
-4.277993e+00	-4.2780e+00	-2.62	8.92e-03	**
1.769799e+00	1.7698e+00	2.59	9.56e-03	**
1.966028e+00	1.9660e+00	2.47	1.34e-02	*
-7.261286e-01	-7.2613e-01	-2.32	2.06e-02	*
1.706916e+00	1.7069e+00	2.17	2.99e-02	*
-2.865921e+00	-2.8659e+00	-2.15	3.13e-02	*
6.577681e-01	6.5777e-01	2.11	3.47e-02	*
-4.073743e-01	-4.0737e-01	-2.07	3.87e-02	*
2.397349e+00	2.3973e+00	2.04	4.18e-02	*

3.093134e-01	3.0931e-01	2.04	4.18e-02	*
-3.181907e-01	-3.1819e-01	-1.99	4.61e-02	*
-2.589378e+00	-2.5894e+00	-1.96	5.04e-02	
7.154128e-01	7.1541e-01	1.92	5.47e-02	
-2.676790e+00	-2.6768e+00	-1.92	5.47e-02	
6.371111e-01	6.3711e-01	1.92	5.48e-02	
2.683149e+00	2.6831e+00	1.88	6.04e-02	
-2.391941e+00	-2.3919e+00	-1.81	7.07e-02	
-4.486833e-01	-4.4868e-01	-1.66	9.68e-02	
5.222682e-01	5.2227e-01	1.62	1.06e-01	
4.042767e-01	4.0428e-01	1.57	1.15e-01	
-1.389647e+00	-1.3896e+00	-1.48	1.38e-01	
4.251555e-01	4.2516e-01	1.42	1.55e-01	
5.683726e-01	5.6837e-01	1.39	1.65e-01	
1.126818e+00	1.1268e+00	1.38	1.66e-01	
1.915838e+00	1.9158e+00	1.38	1.68e-01	
-6.519789e-01	-6.5198e-01	-1.29	1.96e-01	
-2.891317e-01	-2.8913e-01	-1.27	2.05e-01	
2.903023e-01	2.9030e-01	1.21	2.25e-01	
-1.596277e+00	-1.5963e+00	-1.21	2.28e-01	
-8.724436e-01	-8.7244e-01	-1.20	2.30e-01	
-6.528301e-01	-6.5283e-01	-1.19	2.35e-01	
-2.909585e-01	-2.9096e-01	-1.14	2.55e-01	
1.724558e+00	1.7246e+00	1.10	2.73e-01	
1.556912e+00	1.5569e+00	1.07	2.83e-01	
-4.843654e-01	-4.8437e-01	-1.01	3.15e-01	
-5.243748e-01	-5.2437e-01	-0.98	3.29e-01	

5. Leverage Plots for Model Diagnostics

The following plots show residuals vs each predictor to assess model assumptions, identify outliers, and evaluate prediction accuracy across the factor space.