

#### ENGINEERING TOMORROW

#### **Danfoss Industries**

#### **Performance Data**

TDMS file	Mean_Main_Fl	Mean_RPM	Mean_Outlet_P	Mean_Displace	Mean_Inlet_Te
	ow_GPM		ressure_Psi	ment	mp_F
P16_HY5_Eff_ 104F_50%_10 00rpm_1000psi .tdms	3.26271229937 3351	1003.02339238 7586	1007.90561255 8507	12.3134795016 6584	104.192782698 5378
P16_HY5_Eff_ 104F_50%_10 00rpm_2000psi .tdms	3.02669139510 9252	1003.45470782 9881	2008.55545848 9015	11.4178394647 8718	104.133945483 2025
P16_HY5_Eff_ 104F_50%_10 00rpm_3000psi .tdms	2.71477820265 8085	1003.17279281 7291	3000.43435166 9997	10.2440552285 5349	104.033978100 8315
P16_HY5_Eff_ 104F_50%_10 00rpm_4060psi .tdms	2.45171037178 3776	1004.21330422 5665	4055.76963726 9392	9.24179299639 1164	103.917830159 6496
P16_HY5_Eff_ 104F_50%_10 00rpm_4351psi .tdms	2.37829694396 3752	1004.34172533 352	4359.11555298 399	8.96391753837 5318	104.309053757 7799
P16_HY5_Eff_ 104F_50%_10 00rpm_4568psi .tdms	2.37866214550 2505	1003.03940690 6472	4563.78862708 3694	8.97693771995 6766	104.361069527 1728
P16_HY5_Eff_ 104F_50%_10 00rpm_500psi.t dms	3.43189964816 9862	1003.64362972 2713	500.780244302 0078	12.9439878662 3117	104.404074934 352
P16_HY5_Eff_ 104F_50%_10 00rpm_5076psi .tdms	2.23415211725 7334	1003.81133767 5882	5076.79863604 0425	8.42507934168 325	104.504832897 7065
P16_HY5_Eff_ 104F_50%_15 00rpm_1000psi .tdms	5.17355679582 8634	1505.50388673 1872	1007.08654460 0892	13.0082929852 273	106.545943126 428
P16_HY5_Eff_ 104F_50%_15 00rpm_2000psi .tdms	4.73315947452 8107	1505.72822247 2155	2012.09128369 6821	11.8991989350 0018	106.083679847 0563
P16_HY5_Eff_ 104F_50%_15 00rpm_3000psi .tdms	4.50059224414 1135	1506.72095108 953	3006.35647200 9618	11.3070687611 2873	105.664315746 4998
P16_HY5_Eff_ 104F_50%_15 00rpm_4060psi .tdms	4.14310407896 3232	1505.70529195 7295	4052.16719549 454	10.4159525040 1148	104.904914839 4734

TDMS file	Mean_Main_Fl ow_GPM	Mean_RPM	Mean_Outlet_P ressure_Psi	Mean_Displace ment	Mean_Inlet_Te mp_F
P16_HY5_Eff_ 104F_50%_15 00rpm_4351psi .tdms	4.09101996765 6887	1506.28669777 192	4356.33656013 5755	10.2810384904 1058	104.720792931 6366
P16_HY5_Eff_ 104F_50%_15 00rpm_4568psi .tdms	4.06486371409 352	1506.16286338 9361	4558.14699190 5473	10.2161465639 9553	104.611155169 7711
P16_HY5_Eff_ 104F_50%_15 00rpm_500psi.t dms	5.23756974026 616	1506.07372108 6637	497.347673198 0737	13.1642682768 9921	104.773459458 2711
P16_HY5_Eff_ 104F_50%_15 00rpm_5076psi .tdms	3.91103419693 4406	1506.55724535 6925	5072.44140427 0193	9.82695534092 6887	104.650492427 1507
P16_HY5_Eff_ 104F_50%_18 00rpm_1000psi .tdms	6.20488794749 7903	1803.13472953 9781	1017.87723023 5721	13.0262348065 6699	105.823958789 9475
P16_HY5_Eff_ 104F_50%_18 00rpm_2000psi .tdms	5.85230810215 9454	1803.95272909 8247	2004.64744700 2384	12.2804738797 4071	105.574617153 2459
P16_HY5_Eff_ 104F_50%_18 00rpm_3000psi .tdms	5.51759668688 8721	1803.93224198 7875	3001.81350223 6714	11.5782459360 9222	105.326628611 4718
P16_HY5_Eff_ 104F_50%_18 00rpm_4060psi .tdms	5.20836714529 1194	1803.95608921 187	4057.33891564 0417	10.9292093861 4079	105.194343298 4485
P16_HY5_Eff_ 104F_50%_18 00rpm_4351psi .tdms	5.14143386464 0772	1804.50586657 6236	4355.99172144 7471	10.7854664651 5704	105.209054651 7244
P16_HY5_Eff_ 104F_50%_18 00rpm_4568psi .tdms	5.12009132237 5579	1804.36617057 3722	4561.26808699 268	10.7415339518 7552	105.174385632 321
P16_HY5_Eff_ 104F_50%_18 00rpm_500psi.t dms	6.32454267657 0419	1803.67560652 7108	507.586757449 7472	13.2734505321 0075	105.920273469 5628
P16_HY5_Eff_ 104F_50%_18 00rpm_5076psi .tdms	4.99863290639 7091	1804.27191452 6955	5074.11890744 3378	10.4872700735 7503	105.767513976 1125
P16_HY5_Eff_ 104F_50%_20 00rpm_1000psi .tdms	6.89234930486 9103	2002.04232994 0189	997.554438037 8025	13.0318825411 221	106.434340006 646

TDMS file	Mean_Main_Fl ow_GPM	Mean_RPM	Mean_Outlet_P ressure_Psi	Mean_Displace ment	Mean_Inlet_Te mp_F
P16_HY5_Eff_ 104F_50%_20 00rpm_2000psi .tdms	6.50578248460 2942	2001.85593951 93	2006.48096147 9999	12.3021167220 4193	105.951715079 3492
P16_HY5_Eff_ 104F_50%_20 00rpm_3000psi .tdms	6.18058785131 1293	2001.66038413 6322	3003.04292211 1914	11.6883324984 0064	105.988597156 6777
P16_HY5_Eff_ 104F_50%_20 00rpm_4060psi .tdms	5.86178771229 9636	2001.64369548 4015	4058.73073022 2125	11.0855301793 7842	106.395867582 2227
P16_HY5_Eff_ 104F_50%_20 00rpm_4351psi .tdms	5.80391527520 9728	2001.95468999 1732	4355.55859012 3644	10.9743763780 0535	105.996399792 6751
P16_HY5_Eff_ 104F_50%_20 00rpm_4568psi .tdms	5.75785880703 7685	2001.85236169 6267	4567.33296308 9096	10.8878487296 6033	106.468853763 2433
P16_HY5_Eff_ 104F_50%_20 00rpm_500psi.t dms	7.05706079313 6853	2001.08434899 5924	499.172459764 1934	13.3497033514 8993	105.423351454 9785
P16_HY5_Eff_ 104F_50%_20 00rpm_5076psi .tdms	5.60514587337 8397	2001.45489029 8887	5077.08942464 8831	10.6011815697 0117	106.452595328 5463
P16_HY5_Eff_ 104F_50%_25 00rpm_1000psi .tdms	8.78615543600 0994	2501.59107629 1487	1002.61734708 9794	13.2952253653 9661	105.508875931 2852
P16_HY5_Eff_ 104F_50%_25 00rpm_2000psi .tdms	8.28646562900 5047	2499.97597966 6266	2005.33463250 1461	12.5471940663 379	104.875290309 1804
P16_HY5_Eff_ 104F_50%_25 00rpm_3000psi .tdms	7.91452231312 7142	2499.95726327 0914	3013.59853982 4634	11.9840960837 3499	104.155896216 7262
P16_HY5_Eff_ 104F_50%_25 00rpm_4060psi .tdms	7.56489375231 8451	2504.09203204 8165	4058.54339206 416	11.4357775685 1622	103.527246952 7202
P16_HY5_Eff_ 104F_50%_25 00rpm_4351psi .tdms	7.46578611921 89	2503.64086795 3068	4348.75424326 0672	11.2879901772 7961	103.097028965 3906
P16_HY5_Eff_ 104F_50%_25 00rpm_4568psi .tdms	7.40171215262 1529	2503.52891462 4776	4573.13073787 8235	11.1916138215 9717	102.856976374 7991

TDMS file	Mean_Main_Fl ow_GPM	Mean_RPM	Mean_Outlet_P ressure_Psi	Mean_Displace ment	Mean_Inlet_Te mp_F
P16_HY5_Eff_ 104F_50%_25 00rpm_500psi.t dms	8.86038219918 0876	2499.49215766 1295	500.326440739 8873	13.4188015456 3249	106.237252306 9471
P16_HY5_Eff_ 104F_50%_25 00rpm_5076psi .tdms	7.32095745698 3762	2503.20363770 5115	5081.56836304 0309	11.0709504500 6353	102.732995708 2358
P16_HY5_Eff_ 104F_50%_30 00rpm_1000psi .tdms	10.4969269905 3894	3000.54757902 1336	1003.76862325 3055	13.2426470382 373	104.065065784 7378
P16_HY5_Eff_ 104F_50%_30 00rpm_2000psi .tdms	10.0008060677 5937	3000.39699224 6198	2006.15386037 8867	12.6173878422 7992	104.257684609 976
P16_HY5_Eff_ 104F_50%_30 00rpm_3000psi .tdms	9.73653741983 9872	3000.06115081 975	3005.64112062 5662	12.2853517206 3717	104.361843935 2476
P16_HY5_Eff_ 104F_50%_30 00rpm_4060psi .tdms	9.45672692762 2142	3002.08244440 747	4060.41038154 7806	11.9242623791 9396	104.594562188 1656
P16_HY5_Eff_ 104F_50%_30 00rpm_4351psi .tdms	9.38276571307 833	3003.44890636 2624	4351.72235206 3871	11.8256156185 9844	104.879686601 3642
P16_HY5_Eff_ 104F_50%_30 00rpm_4568psi .tdms	9.32217865601 1703	3003.26315942 5009	4563.23747310 3197	11.7499810536 102	105.161802737 0207
P16_HY5_Eff_ 104F_50%_30 00rpm_500psi.t dms	10.6948918705 9144	3001.03497539 5549	499.364712638 1346	13.4902020318 8374	103.746150989 599
P16_HY5_Eff_ 104F_50%_30 00rpm_5076psi .tdms	9.11194872879 8323	3001.06266563 2757	5072.04946146 1063	11.4934200428 2425	105.588596798 6485
P16_HY5_Eff_ 104F_50%_35 00rpm_1000psi .tdms	12.2530659160 0567	3499.53378569 3772	1002.88656897 2405	13.2540229076 3231	106.775455810 3411
P16_HY5_Eff_ 104F_50%_35 00rpm_2000psi .tdms	11.8276355795 1603	3498.91825152 9121	2005.34678391 1534	12.7960894232 2431	107.334660651 521
P16_HY5_Eff_ 104F_50%_35 00rpm_3000psi .tdms	11.4531423509 9354	3495.65545949 232	3003.78762924 0135	12.4024978454 2595	105.570614026 9773

TDMS file	Mean_Main_Fl ow_GPM	Mean_RPM	Mean_Outlet_P ressure_Psi	Mean_Displace ment	Mean_Inlet_Te mp_F
P16_HY5_Eff_ 104F_50%_35 00rpm_4060psi .tdms	11.0650696651 429	3492.54833383 116	4062.27474234 2199	11.9929254254 7659	104.122944938 3884
P16_HY5_Eff_ 104F_50%_35 00rpm_4351psi .tdms	11.0652836721 525	3492.99597272 7808	4359.09925825 967	11.9916173856 1302	103.868284878 4252
P16_HY5_Eff_ 104F_50%_35 00rpm_4568psi .tdms	10.9899999920 3425	3488.03395230 4416	4565.69614605 4839	11.9269708984 5499	104.127884152 0839
P16_HY5_Eff_ 104F_50%_35 00rpm_500psi.t dms	12.5179107768 9767	3499.15499692 395	498.872546910 5324	13.5419684247 7637	106.335680135 1177
P16_HY5_Eff_ 104F_50%_35 00rpm_5076psi .tdms	10.7312089022 3722	3489.53771137 5643	5076.43303226 998	11.6410973500 4154	103.903723188 6959
P16_HY5_Eff_ 104F_50%_50 0rpm_1000psi.t dms	1.50902223464 3989	502.712482009 0245	1008.86238629 0476	11.3629361174 1061	105.359332173 6379
P16_HY5_Eff_ 104F_50%_50 0rpm_2000psi.t dms	1.27432412420 9341	502.180342933 4876	2004.13634743 2006	9.60580544217 6036	104.872404775 4883
P16_HY5_Eff_ 104F_50%_50 0rpm_3000psi.t dms	1.03655336554 5299	502.271311912 6819	3004.86873819 3677	7.81205103103 6527	104.518974557 5139
P16_HY5_Eff_ 104F_50%_50 0rpm_4060psi.t dms	0.77296115455 23868	502.589149482 5505	4066.67871325 163	5.82179028919 8109	104.559449711 8157
P16_HY5_Eff_ 104F_50%_50 0rpm_500psi.td ms	1.61661439483 2649	502.177409960 6442	502.325081784 3149	12.1860632806 8804	104.444002740 996

#### **Statistics**

Column	Min	Max	Average	Median	IQR
Mean_Main_FI	0.77296115455	12.5179107768	6.42102625657	5.86178771229	5.02092876114
ow_GPM	23868	9767	9622	9636	1436
Mean_RPM	502.177409960	3499.53378569	2049.48314963	2001.45489029	1494.33292834
	6442	3772	2254	8887	75948
Mean_Outlet_P ressure_Psi	497.347673198	5081.56836304	2993.24945836	3006.35647200	3341.22202802
	0737	0309	09623	9618	3949
Mean_Displace ment	5.82179028919	13.5419684247	11.4895937892	11.6883324984	1.76172760118
	8109	7637	33949	0064	08602
Mean_Inlet_Te	102.732995708	107.334660651	104.989429262	104.875290309	1.50982936613
mp_F	2358	521	35638	1804	65005

#### **Outliers**

TDMS file	Mean_Displacement	Outlier Type
P16_HY5_Eff_104F_50%_500rpm _3000psi.tdms	7.812051031036527	Lower
P16_HY5_Eff_104F_50%_500rpm _4060psi.tdms	5.821790289198109	Lower

#### **VE Pivot**

Outlet Pressure	2049
2993.0	84.84434041518372

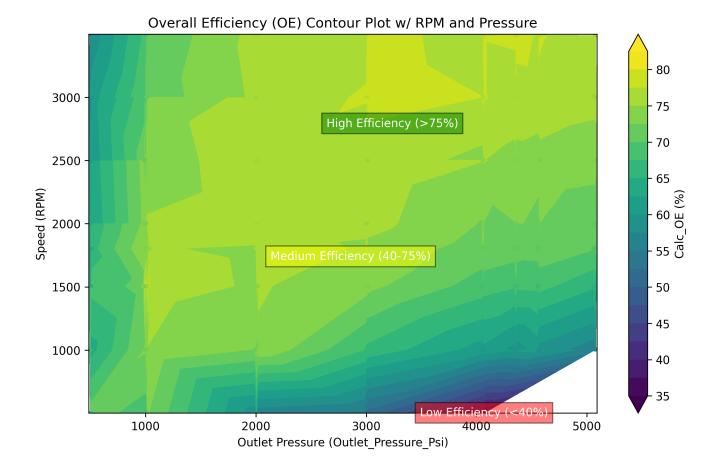
#### **ME Pivot**

Outlet Pressure	2049
2993.0	83.59525714604544

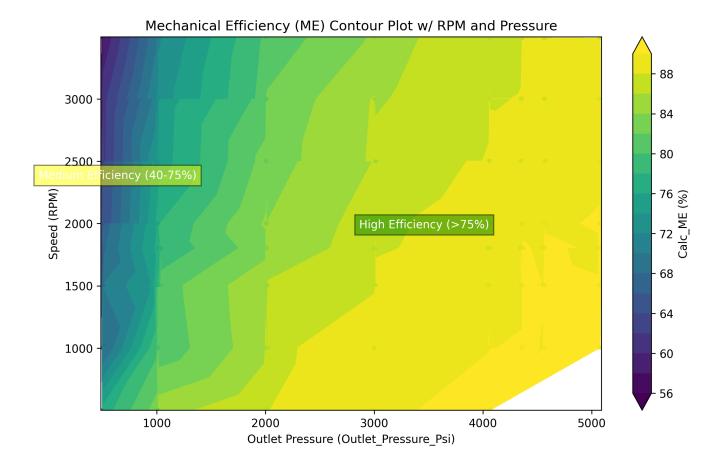
## **OE Pivot**

Outlet Pressure	2049
2993.0	70.24895657185037

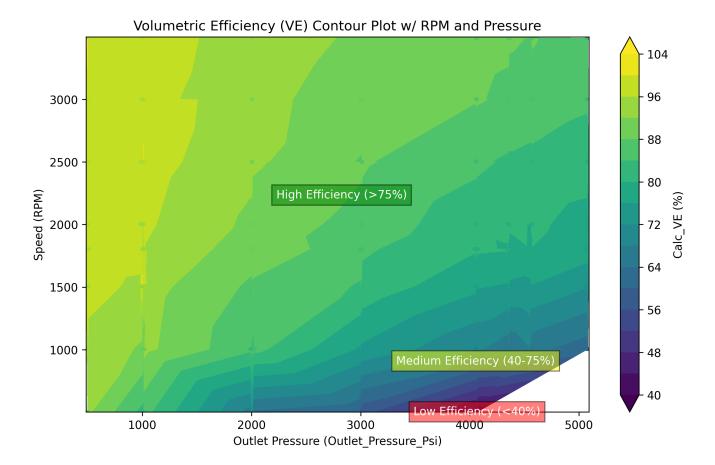
### oe\_contour\_plot



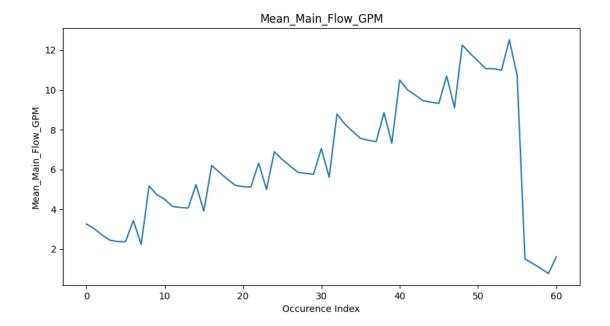
## me\_contour\_plot



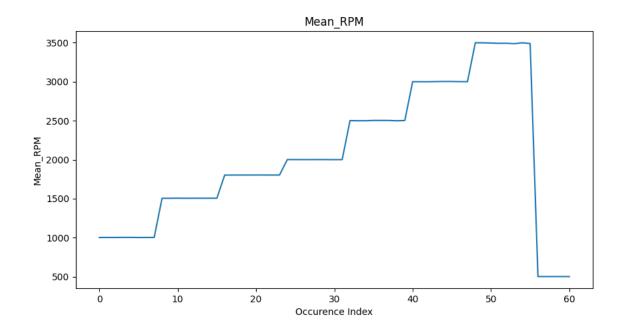
## ve\_contour\_plot



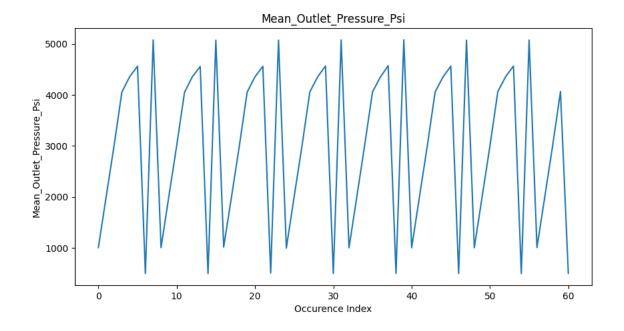
## Mean\_Main\_Flow\_GPM Plot



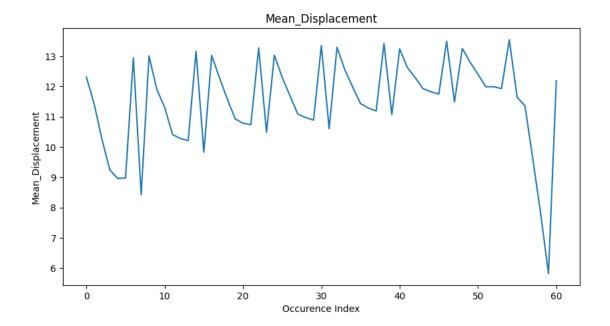
## Mean\_RPM Plot



## Mean\_Outlet\_Pressure\_Psi Plot



# **Mean\_Displacement Plot**



# Mean\_Inlet\_Temp\_F Plot

