Objective :

From this experiment we will able to the V Curves of Three Phase Synchronous Motor.

Apparatus :

1. Power Supply
2. AC voltmeters
3. AC ammeters
4. DC shunt generator
5. 3 phase Synchronous motor

Procedure:

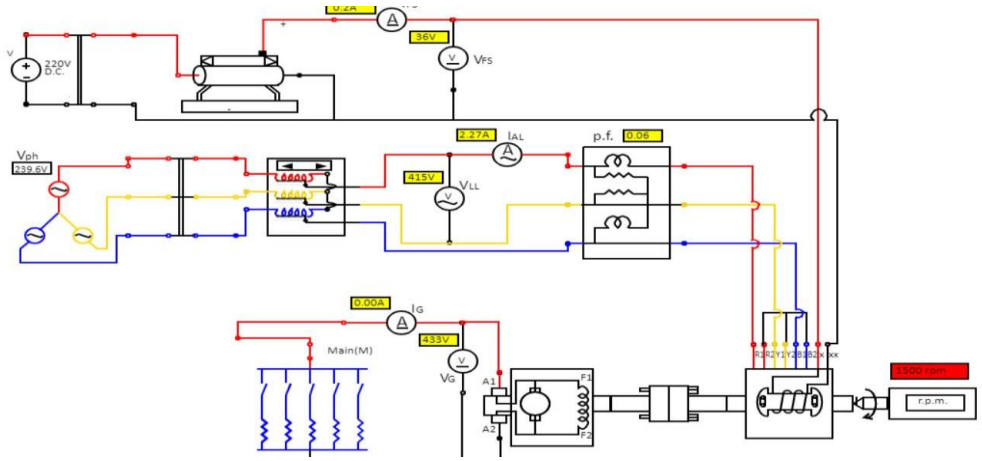
•First we have to connect three phase connection to the stator of the motor, thus motor will behave like an induction motor and the motor will obtain its speed slightly less than synchronous speed. And all of this can be achieved by three phase supply with TPST for synchronous motor.

•Now, virtual simulation would be run for synchronous motor and it can be tested for three condition

•First, we will try the no load condition and no load means there is no resistive force acting upon the motor.

•Lastly, we will try the full load condition where all five resistive load are connected.

No Load:



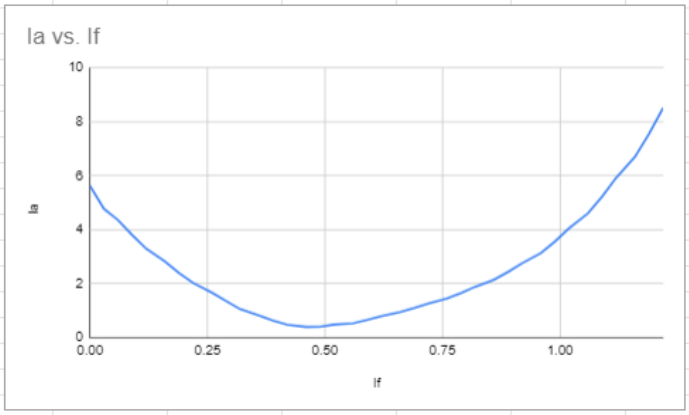
Here my id is 18321047 so the step size to collect the data should be 3.

VL (L-L)	If	Ia
415	0	5.64
415	0.03	4.78
415	0.06	4.36
415	0.09	3.81
415	0.12	3.30
415	0.16	2.83
415	0.19	2.40
415	0.22	2.03
415	0.26	1.67
415	0.29	1.36
415	0.32	1.06
415	0.36	0.82

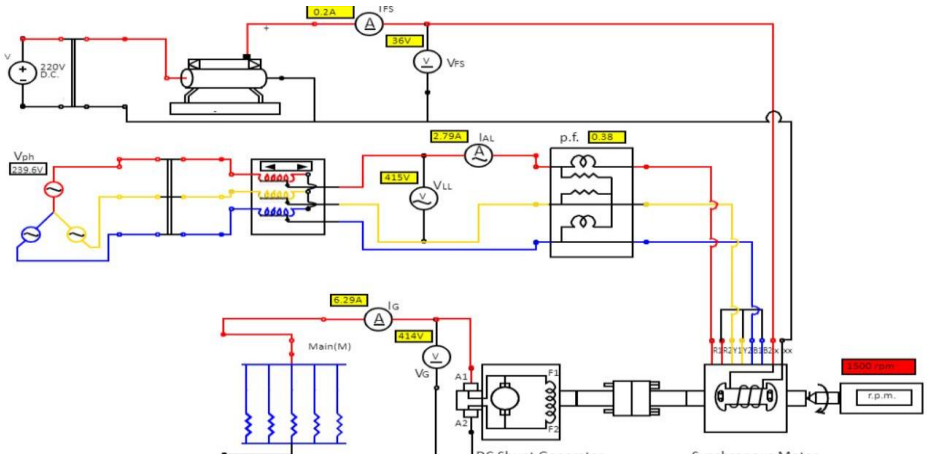
415	0.39	0.63
415	0.42	0.48
415	0.46	0.40
415	0.49	0.41
415	0.52	0.49
415	0.56	0.53
415	0.59	0.66
415	0.62	0.80
415	0.66	0.95
415	0.69	1.10
415	0.72	1.27
415	0.76	1.45
415	0.79	1.66
415	0.82	1.89
415	0.86	2.15
415	0.89	2.44
415	0.92	2.76
415	0.96	3.14
415	0.99	3.57
415	1.02	4.06
415	1.06	4.61
415	1.09	5.23
415	1.12	5.93
415	1.16	6.70

415	1.19	7.56
415	1.22	8.52

If	Ia
0	5.64
0.03	4.78
0.06	4.36
0.09	3.81
0.12	3.3
0.16	2.83
0.19	2.4
0.22	2.03
0.26	1.67
0.29	1.36
0.32	1.06
0.36	0.82
0.39	0.63
0.42	0.48
0.46	0.4
0.49	0.41
0.52	0.49
0.56	0.53
0.59	0.66
0.62	0.8
0.66	0.95
0.69	1.1



Full Load:

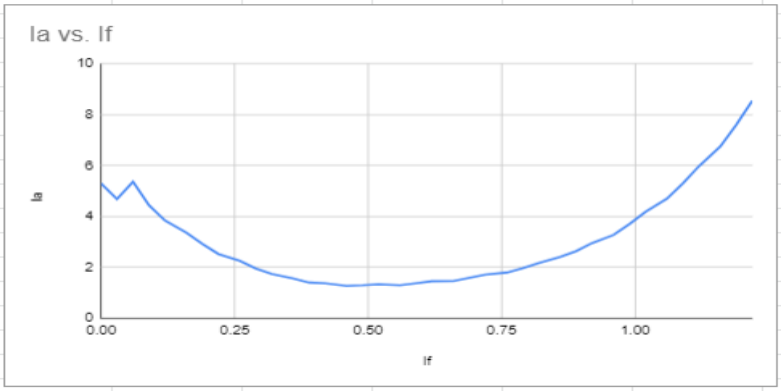


Here my id is 18321047 so the step size to collect the data should be 3.

VL (L-L)	If	Ia
415	0	5.31
415	0.03	4.69
415	0.06	5.37
415	0.09	4.44
415	0.12	3.84
415	0.16	3.37
415	0.19	2.93
415	0.22	2.53
415	0.26	2.26
415	0.29	1.96
415	0.32	1.75
415	0.36	1.57
415	0.39	1.41
415	0.42	1.38
415	0.46	1.28
415	0.49	1.30
415	0.52	1.34
415	0.56	1.30
415	0.59	1.38
415	0.62	1.46
415	0.66	1.47
415	0.69	1.59

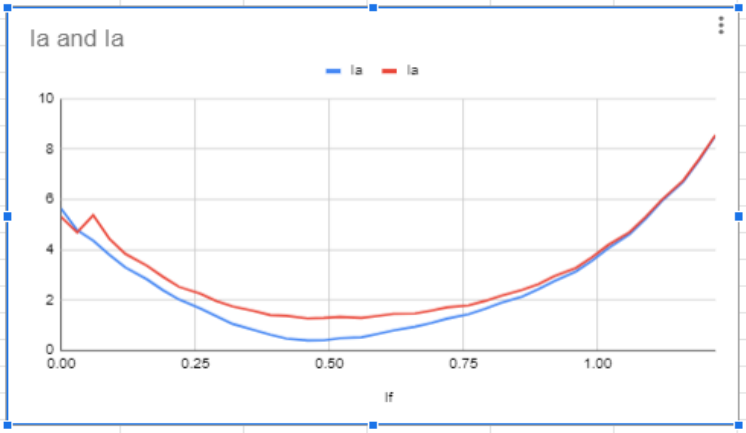
415	0.72	1.72
415	0.76	1.80
415	0.79	1.97
415	0.82	2.18
415	0.86	2.41
415	0.89	2.64
415	0.92	2.96
415	0.96	3.28
415	0.99	3.71
415	1.02	4.19
415	1.06	4.70
415	1.09	5.31
415	1.12	5.98
415	1.16	6.75
415	1.19	7.61
415	1.22	8.55

If	Ia
0	5.31
0.03	4.69
0.06	5.37
0.09	4.44
0.12	3.84
0.16	3.37
0.19	2.93
0.22	2.53
0.26	2.26
0.29	1.96
0.32	1.75
0.36	1.57
0.39	1.41
0.42	1.38
0.46	1.28
0.49	1.3
0.52	1.34
0.56	1.3
0.59	1.38
0.62	1.46
0.66	1.47
0.69	1.59

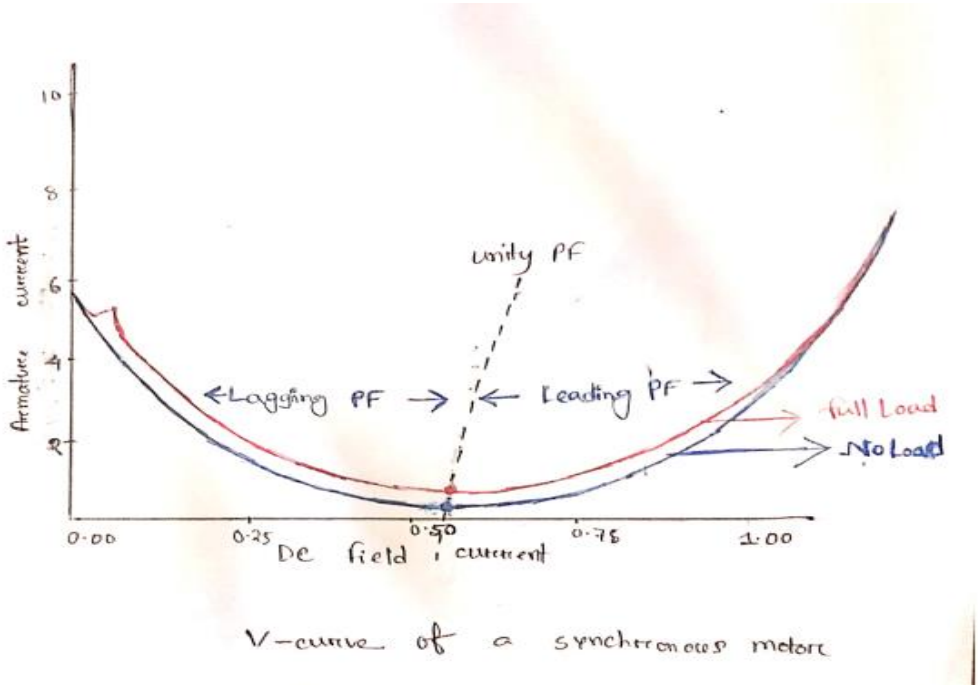


So the V-curve of No-Load and Full-Load is:

If	Ia	Ia
0	5.64	5.31
0.03	4.78	4.69
0.06	4.36	5.37
0.09	3.81	4.44
0.12	3.3	3.84
0.16	2.83	3.37
0.19	2.4	2.93
0.22	2.03	2.53
0.26	1.67	2.26
0.29	1.36	1.96
0.32	1.06	1.75
0.36	0.82	1.57
0.39	0.63	1.41
0.42	0.48	1.38
0.46	0.4	1.28
0.49	0.41	1.3
0.52	0.49	1.34
0.56	0.53	1.3
0.59	0.66	1.38
0.62	0.8	1.46
0.66	0.95	1.47
0.69	1.1	1.59



Marking the zones:



V-curve of a synchronous motor

Discussion : We faced some trouble while taking so many values but ultimately we plotted the V-curve.