



## **BUCK-BOOST TRANSFORMERS**

### **Enclosed Single Phase**

#### **A SIMPLE AND ECONOMICAL WAY TO CORRECT OFFSTANDARD VOLTAGES**

- Buck-boost transformers are small single phase transformers designed to reduce (buck), or raise (boost) line voltage.
- The most common example is boosting 208 volts to 230 volts for motor load operation.
- Buck-boosts are standard single phase transformers with primary voltages of 120/240, and secondary voltages of 12/24, and/or 16/32.
- They are available in sizes ranging from 50VA to 5KVA.

#### **APPLICATIONS**

- When supply voltage is constantly too high or too low, the equipment fails to operate at maximum efficiency.
- Anytime you have a lower than standard voltage, equipment damage or failure can result.
- Efficient operation of electrical equipment requires that line voltage be at or near the nameplate rating of the equipment. In order to match line voltage with equipment voltage, buck-boost transformers provide the most convenient and least expensive method.
- Do not use buck-boost transformers to solve a fluctuating voltage problem.

#### **STEPS FOR SELECTING THE PROPER BUCK-BOOST TRANSFORMER**

##### **LINE VOLTAGE**

- The voltage that you want to buck (decrease) or boost (increase).
- This can be found by measuring the supply line voltage with a voltmeter.

##### **LOAD VOLTAGE**

- The voltage at which your equipment is designed to operate.
- This is listed on the nameplate of the load equipment.

##### **LOAD KVA OR LOAD AMPS**

- You do not need to know both – one or the other is sufficient.
- This information usually can be found on the nameplate of your equipment.

##### **FREQUENCY**

- The supply line frequency must be the same as the frequency of the equipment to be operated – either 50 or 60 cycles.

#### **SELECTION CHART**

- 1-From the top row, choose the combination of LINE and LOAD VOLTAGE closest to the one you will require.
- 2-Move down from the column you have chosen and go to the KVA or Ampere rating that you require for your equipment to operate. If you cannot find the exact value of the LOAD KVA or LOAD AMPS, use the next higher rating.
- 3-The Model # can be found on the left hand column.
- 4-Once you have determined the proper transformer, the corresponding connection diagram can be found at the top of the page.
- 5-Refer to page 4 for dimensional information.

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# SELECTION CHARTS

120/240 – 12/24 VOLTS

Single Phase Control Transformers			BOOSTING								BUCKING								
			110	105	100	96	220	198	220	208	132	126	144	137	231	252	264	228	241
			120	115	120	115	231	208	241	228	120	115	120	115	220	240	240	208	220
VA Rating	Model No.	Connection Diagrams	A	A	B	B	E	E	F	F	C	C	D	D	G	G	H	H	H
		KVA	0.50	0.48	0.25	0.24	0.96	0.87	0.50	0.46	0.55	0.53	0.30	0.29	0.96	1.05	0.55	0.48	0.50
50	MC50V	LOAD AMPS	4.17	4.17	2.08	2.08	4.17	4.17	2.08	2.08	4.58	4.57	2.50	2.48	4.36	4.375	2.29	2.28	2.28
		SUGGESTED FUSE SIZE	7	7	4	4	7	7	3	3	6	7	3	3	6	6	3	3	3
		KVA	1.00	0.96	0.50	0.48	1.92	1.73	1.00	0.95	1.10	1.05	0.60	0.57	1.92	2.10	1.10	0.95	1.00
100	MC100F	LOAD AMPS	8.33	8.33	4.17	4.17	8.33	8.33	4.17	4.17	9.16	9.13	5.00	4.96	8.75	8.75	4.58	4.57	4.56
		SUGGESTED FUSE SIZE	12	12	8	8	12	12	7	7	12	12	6	6	12	12	6	6	6
		KVA	1.51	1.44	0.75	0.72	2.89	2.60	1.51	1.43	1.65	1.58	0.90	0.86	2.89	3.15	1.65	1.43	1.51
150	MC150F	LOAD AMPS	12.50	12.50	6.25	6.25	12.50	12.50	6.25	6.27	13.74	13.74	7.50	7.45	13.13	13.13	6.88	6.85	6.85
		SUGGESTED FUSE SIZE	20	20	12	12	20	20	10	10	20	20	10	10	20	20	10	10	10
		KVA	2.00	1.92	1.00	0.96	3.85	3.47	2.01	1.91	2.20	2.10	1.20	1.14	3.85	4.20	2.20	1.90	2.01
200	MC200F	LOAD AMPS	16.67	16.67	8.33	8.33	16.67	16.67	8.33	8.33	18.33	18.25	10.0	9.93	17.50	17.50	9.17	9.13	9.13
		SUGGESTED FUSE SIZE	25	25	15	15	25	25	12	12	25	25	12	12	25	25	12	12	12
		KVA	2.50	2.40	1.25	1.20	4.81	4.33	2.51	2.36	2.75	2.62	1.50	1.43	4.81	5.25	2.75	2.38	2.51
250	MC250F	LOAD AMPS	20.83	20.83	10.42	10.42	20.83	20.83	10.42	10.42	22.91	22.82	12.50	12.41	21.87	21.87	11.46	11.41	11.42
		SUGGESTED FUSE SIZE	30	30	20	20	30	30	15	15	30	30	15	15	30	30	15	15	15
		KVA	3.50	3.35	1.75	1.68	6.74	6.07	3.51	3.33	3.85	3.68	2.10	2.00	6.74	7.35	3.85	3.32	3.51
350	MC350V	LOAD AMPS	29.17	29.17	14.58	14.58	29.17	29.17	14.58	14.58	32.08	31.96	17.50	17.37	30.63	30.63	16.04	15.99	15.98
		SUGGESTED FUSE SIZE	40	40	25	25	40	40	20	20	40	40	20	20	40	40	20	20	20
		KVA	5.00	4.80	2.50	2.40	9.63	8.67	5.02	4.75	5.50	5.25	3.00	2.85	9.63	10.50	5.50	4.75	5.02
500	MC500F	LOAD AMPS	41.67	41.67	20.83	20.83	41.67	41.67	20.83	20.83	45.83	45.65	25.00	24.82	43.75	43.75	22.92	22.83	22.82
		SUGGESTED FUSE SIZE	60	60	35	35	60	60	30	30	60	60	30	30	60	60	30	30	30
		KVA	7.50	7.19	3.75	3.60	14.44	13.00	7.53	7.13	8.25	7.88	4.50	4.28	14.44	15.75	8.25	7.13	7.53
750	MC750T	LOAD AMPS	62.5	62.5	31.25	31.25	62.5	62.5	31.25	31.25	68.75	68.48	37.50	37.23	65.63	65.63	34.38	34.25	34.23
		SUGGESTED FUSE SIZE	90	90	50	50	90	90	45	45	80	80	40	40	80	80	40	40	40
		KVA	10.00	9.58	5.00	4.80	19.25	17.33	10.04	9.50	11.00	10.5	6.00	5.71	19.25	21.00	11.00	9.50	10.04
1000	MC1KT	LOAD AMPS	83.33	83.33	41.66	41.66	83.33	83.33	41.66	41.66	91.66	91.30	50.00	49.64	87.50	87.50	45.83	45.67	45.64
		SUGGESTED FUSE SIZE	125	125	70	70	110	110	60	60	110	110	60	60	110	110	60	60	60
		KVA	15.00	14.40	7.50	7.19	28.88	26.00	15.00	14.19	16.50	15.75	9.00	8.56	28.86	31.50	16.50	14.19	15.0
1500	MC1K5B	LOAD AMPS	125.0	125.0	62.50	62.50	125.0	125.0	62.25	62.25	137.5	136.96	75.00	74.46	131.25	131.25	68.75	68.23	68.19
		SUGGESTED FUSE SIZE	175	175	100	100	175	175	90	90	175	175	80	80	175	175	80	80	80
		KVA	20.00	19.17	10.00	9.58	38.5	34.67	20.08	19.00	22.00	21.00	12.00	11.42	38.50	42.00	22.00	19.00	20.08
2000	MC2KB	LOAD AMPS	166.7	166.7	83.33	83.33	166.7	166.7	83.33	83.33	183.33	182.60	100.0	99.28	175.0	175.0	91.66	91.35	91.29
		SUGGESTED FUSE SIZE	250	250	125	125	250	250	125	125	250	250	110	110	250	250	110	110	110
		KVA	30.0	28.75	15.0	14.4	57.75	52.00	30.12	28.50	33.00	31.50	18.00	17.13	57.75	63.00	33.00	28.50	30.125
3000	MC3KB	LOAD AMPS	250.0	250.0	125.0	125.0	250.0	250.0	125.0	125.0	275.0	273.91	150.0	148.91	262.50	262.50	137.5	137.02	136.93
		SUGGESTED FUSE SIZE	400	400	200	200	400	400	200	175	400	400	175	175	400	400	175	175	175
		KVA	50.00	47.92	25.00	23.96	96.25	86.66	50.21	47.50	55.00	52.50	30.00	28.54	96.25	105.0	55.00	47.50	50.21
5000	MC5KB	LOAD AMPS	416.7	416.7	208.3	208.3	416.7	416.7	208.3	208.3	458.33	456.51	250.0	248.18	437.50	437.50	229.12	228.36	228.22
		SUGGESTED FUSE SIZE	600	600	400	400	600	600	300	300	600	600	300	300	600	600	300	300	300

Diagram A

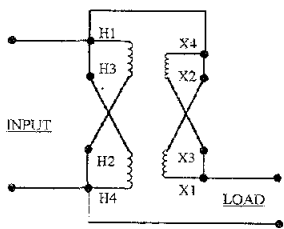


Diagram B

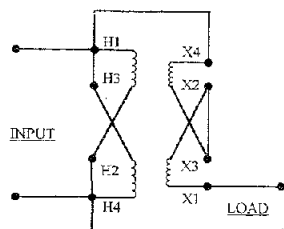


Diagram C

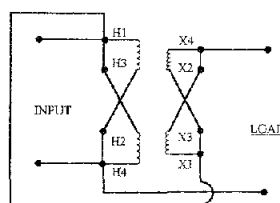


Diagram D

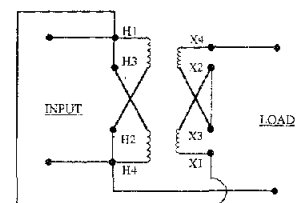


Diagram E

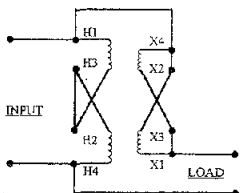


Diagram F

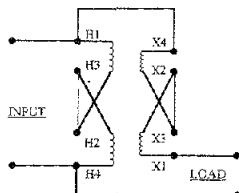


Diagram G

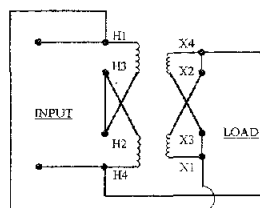
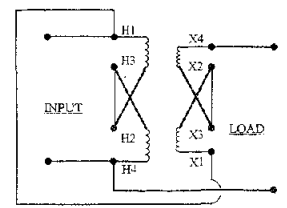


Diagram H



# SELECTION CHARTS

## 120/240 - 16/32 VOLTS

Single Phase Control Transformers			BOOSTING							BUCKING								
	Input Voltage		106	101	95	208	220	203	220	136	129	152	145	256	235	236	261	272
	OUTPUT Voltage (LOAD)		120	115	120	236	249	230	235	120	115	120	115	240	220	208	230	240
VA Rating	Model No.	Connection Diagrams	A	A	B	F	F	F	E	C	C	D	D	G	G	H	H	H
		KVA	0.375	0.36	0.19	0.37	0.39	0.36	0.73	0.425	0.40	0.24	0.23	0.80	0.73	0.37	0.41	0.43
50	MC50W	LOAD AMPS	3.13	3.13	1.56	1.56	1.56	1.56	3.13	3.54	3.50	1.98	1.97	3.33	3.34	1.77	1.77	1.77
		SUGGESTED FUSE SIZE	5	5	3	2	2	2	5	5	5	2	2	5	5	2	2	2
		KVA	0.75	0.72	0.38	0.74	0.78	0.72	1.47	0.85	0.81	0.475	0.45	1.60	1.47	0.74	0.82	0.85
100	MC100G	LOAD AMPS	6.25	6.25	3.13	3.13	3.13	3.13	6.30	7.08	7.01	3.98	3.94	6.67	6.68	3.55	3.55	3.54
		SUGGESTED FUSE SIZE	10	10	6	5	5	5	10	10	10	5	5	10	10	5	5	5
		KVA	1.13	1.08	0.56	1.11	1.17	1.08	2.20	1.28	1.21	0.72	0.68	2.40	2.20	1.11	1.22	1.28
150	MC150G	LOAD AMPS	9.38	9.38	4.69	4.69	4.69	4.69	9.36	10.63	10.52	5.94	5.91	10.00	10.01	5.32	5.32	5.32
		SUGGESTED FUSE SIZE	15	15	8	8	8	8	15	12	12	7	7	12	12	7	7	7
		KVA	1.50	1.44	0.75	1.48	1.56	1.44	2.94	1.70	1.61	0.95	0.91	3.20	2.94	1.48	1.63	1.70
200	MC200G	LOAD AMPS	12.50	12.5	6.25	6.25	6.25	6.25	12.50	14.17	14.02	7.92	7.88	13.33	13.35	7.09	7.09	7.08
		SUGGESTED FUSE SIZE	20	20	12	10	10	10	20	20	20	10	10	20	20	10	10	10
		KVA	1.88	1.80	0.94	1.84	1.95	1.80	3.67	2.13	2.02	1.19	1.13	4.00	3.67	1.84	2.04	2.13
250	MC250G	LOAD AMPS	15.63	15.63	7.81	7.80	7.81	7.81	15.63	17.71	17.53	9.90	9.85	16.67	16.70	8.86	8.85	8.85
		SUGGESTED FUSE SIZE	25	25	15	12	12	12	25	20	20	12	12	20	20	12	12	12
		KVA	2.63	2.52	1.31	2.58	2.72	2.52	5.14	2.98	2.82	1.66	1.59	5.60	5.14	2.58	2.86	2.97
350	MC350W	LOAD AMPS	21.88	21.88	10.94	10.94	10.94	10.94	21.88	24.79	24.54	13.85	13.79	23.33	23.37	12.41	12.41	12.40
		SUGGESTED FUSE SIZE	35	35	20	20	20	20	30	30	30	15	15	30	30	15	15	15
		KVA	3.75	3.59	1.88	3.69	3.89	3.59	7.34	4.25	4.03	2.38	2.27	8.00	7.34	3.69	4.08	4.25
500	MC500G	LOAD AMPS	31.25	31.25	15.63	15.63	15.63	15.63	31.25	35.42	35.05	19.83	19.70	33.33	33.38	17.72	17.73	17.71
		SUGGESTED FUSE SIZE	45	45	25	25	25	25	45	40	40	20	20	40	40	20	20	20
		KVA	5.63	5.39	2.81	5.53	5.84	5.39	11.02	6.38	6.05	3.56	3.40	12.00	11.02	5.53	6.12	6.38
750	MC750U	LOAD AMPS	46.91	46.88	23.44	23.44	23.44	23.44	46.88	53.16	52.58	29.69	29.55	50.00	50.07	26.60	26.60	26.56
		SUGGESTED FUSE SIZE	70	70	40	35	35	35	70	60	60	30	30	60	60	30	30	30
		KVA	7.50	7.19	3.75	7.38	7.78	7.19	14.69	8.50	8.06	4.75	4.53	16.00	14.69	7.38	8.16	8.50
1000	MC1000	LOAD AMPS	62.50	62.50	31.25	31.25	31.25	31.25	62.50	70.83	70.12	39.58	39.40	66.67	66.76	35.46	35.46	35.42
		SUGGESTED FUSE SIZE	90	90	50	45	45	45	90	80	80	40	40	80	80	40	40	40
		KVA	11.25	10.78	5.63	11.06	11.67	10.78	22.03	12.75	12.09	7.13	6.80	24.00	22.03	11.06	12.23	12.75
1500	MC1500	LOAD AMPS	93.75	93.75	46.90	46.88	46.88	46.88	93.75	106.25	105.16	59.38	59.10	100.00	100.14	53.19	53.19	53.13
		SUGGESTED FUSE SIZE	150	150	80	70	70	70	125	125	125	60	60	125	125	60	60	60
		KVA	15.00	14.38	7.50	14.75	15.56	14.38	29.37	17.00	16.13	9.50	9.06	32.00	29.37	14.75	16.31	17.00
2000	MC2000	LOAD AMPS	125.0	125.0	62.50	62.50	62.50	62.50	125.0	141.67	140.26	79.17	78.80	133.33	133.52	70.91	70.91	70.83
		SUGGESTED FUSE SIZE	200	200	100	90	90	90	175	175	175	80	80	175	175	80	80	80
		KVA	22.50	21.56	11.25	22.13	23.34	21.56	44.06	25.50	24.19	14.25	13.59	48.00	44.06	22.13	24.47	25.50
3000	MC3000	LOAD AMPS	187.5	187.5	93.75	93.75	93.75	93.75	187.5	212.5	210.3	118.8	118.2	200.0	200.3	106.4	106.4	106.3
		SUGGESTED FUSE SIZE	300	300	150	150	150	150	250	250	250	125	125	250	250	125	125	125
		KVA	37.50	35.94	18.75	36.88	38.91	35.94	73.44	42.50	40.31	23.75	22.66	80.00	73.44	36.88	40.78	42.5
5000	MC5000	LOAD AMPS	312.5	312.5	156.3	156.3	156.3	156.3	312.5	354.2	350.5	197.9	197.0	333.3	333.8	177.3	177.3	177.1
		SUGGESTED FUSE SIZE	500	500	250	250	250	250	500	400	400	200	200	400	400	200	200	200

Diagram A

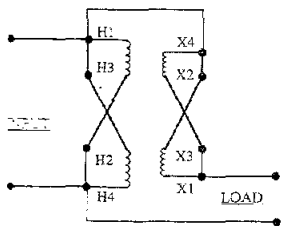


Diagram B

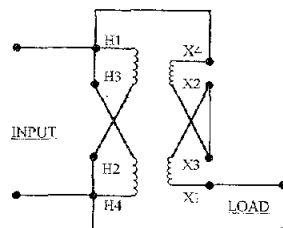


Diagram C

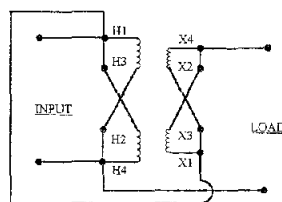


Diagram D

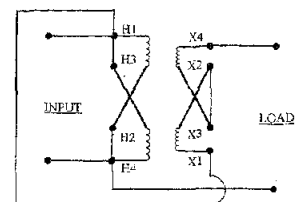


Diagram E

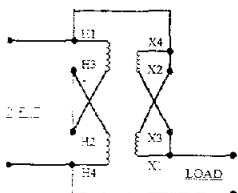


Diagram F

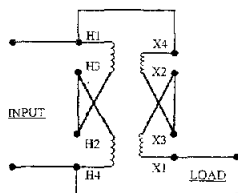


Diagram G

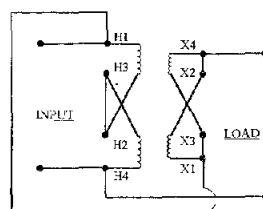
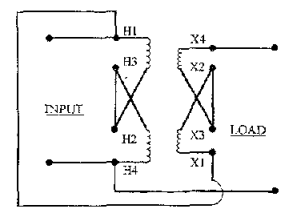


Diagram H



# BUCK-BOOST TYPE MC

# SINGLE PHASE 50 VA - 5000 VA

## ISOMETRIC DIAGRAMS

LETTER	MOUNTING SLOTS INCHES/MM a b
S	0.25 x 0.500 6.4 x 12.7
T	0.25 x 0.625 6.4 x 15.9
U	0.25 x 0.875 6.4 x 22.2
V	0.30 x 0.560 7.6 x 14.2
W	0.31 x 0.630 7.9 x 16.0
X	0.31 x 0.750 7.9 x 19.0
Y	0.31 x 0.875 7.9 x 22.2
Z	0.31 x 1.125 7.9 x 28.6

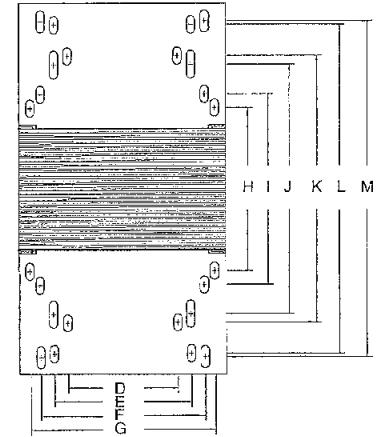
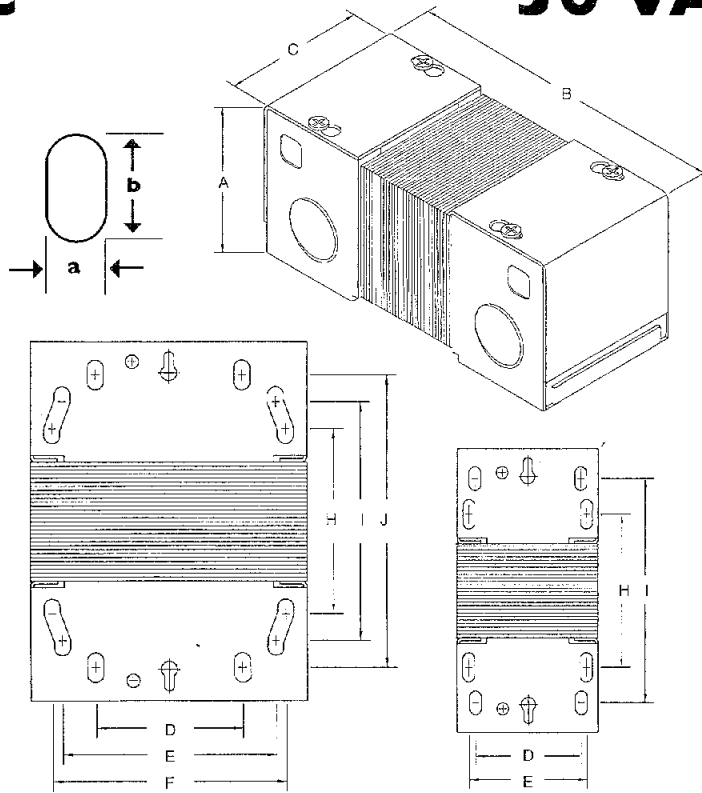


FIG. 2

FIG. 1

FIG. 3

## DIMENSION TABLE

VA	A	B	C	D	E	F	G	H	I	J	K	L	M	FIG.	SHIP WT. LBS/KG
50	2.82 71.6	5.13 130.3	3.13 79.5	2.25 57.2	2.50 63.5			2.25(T) 57.2	3.75(S) 95.3					1	3.25 1.5
100	2.82 71.6	5.38 136.7	3.13 79.5	2.25 57.2	2.50 63.5			2.50(T) 63.5	4.00(S) 101.6					1	3.75 1.7
150	3.45 87.6	5.88 149.4	3.75 95.3	2.25 57.2	3.13 79.5			3.00(T) 76.2	4.75(S) 120.7					1	6.75 3.1
200	3.45 87.6	6.13 155.7	3.75 95.3	2.25 57.2	3.13 79.5			3.25(T) 82.6	5.00(S) 127.9					1	7.00 3.2
250	4.07 103.4	6.13 155.7	4.50 114.3	2.75 69.9	3.75 95.3			2.75(T) 69.9	4.38(U) 111.3					1	8.50 3.9
350	4.07 103.4	7.13 181.1	4.50 114.3	2.75 69.9	3.75 95.3			3.75(T) 95.3	5.38(U) 136.7					1	12.00 5.5
500	4.70 119.4	6.63 168.4	5.25 133.4	2.75 69.9	4.00 101.6	4.38 111.3		3.25(V) 82.6	4.25(V) 108.0	5.25 133.4				2	14.50 6.6
750	4.70 119.4	7.63 103.8	5.25 133.4	2.75 69.9	4.00 101.6	4.38 111.3		4.25(V) 108.0	5.25(V) 133.4	6.25 158.8				2	21.00 9.6
1000	4.70 119.4	8.63 219.2	5.25 133.4	2.75 69.9	4.00 101.6	4.38 111.3		5.25(V) 133.4	6.25(V) 158.8	7.25 184.2				2	27.00 12.3
1500	6.58 167.1	12.13 308.2	7.50 190.5	4.00 101.6	5.00 127.0	6.00 152.4	6.75 171.30	3.50 89.0	4.50(W) 114.3	6.63 168.4	7.25 184.2	9.50 244.3	9.70 246.6	3	39.00 17.8
2000	6.58 167.1	12.13 308.2	7.50 190.5	4.00 101.6	5.00 127.0	6.00 152.4	6.75 171.3	4.50 114.3	5.50(W) 139.7	7.63 193.8	8.25 208.6	10.50 266.7	10.70 271.8	3	42.00 19.2
3000	6.58 167.1	14.13 358.9	7.50 190.5	4.00 101.6	5.00 127.0	6.00 152.4	6.75 171.3	6.50 105.1	7.50(W) 190.5	9.63 244.6	10.25 260.4	12.50 317.5	12.70 322.6	3	62.00 28.3
5000	8.33 211.6	14.15 359.4	9.00 228.6	6.00 152.4	8.00 203.2			5.75 146.0	9.88(Z) 251.0					1	94.00 43.0

NOTE: All dimensions are ±0.06 in. except for "C" which is ±0.25 in.