



# POWER/VAC<sup>®</sup> Application Update

December 11, 2002

Issue No. 2

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## **INTRODUCTION –**

***This is the second installment in the “POWER/VAC Application Update” series. Our intent is to inform you of the current design enhancements, providing application tips and other information necessary to assist you in selling, applying and engineering POWER/VAC Switchgear.***

## **SUBJECT # 3 – 3500A/4000A Power/VAC Switchgear – ANSI & UL**

I am pleased to announce two improvements to our 3500A and 4000A Power/VAC Switchgear offering. First, the design now meets the requirements of ANSI C37.20, for MetalClad construction. Our earlier design utilized ventilation louvers in the main bus enclosure. These intentional openings for cooling forced us to classify 3500A and 4000A rated Power/VAC as Metal-Enclosed, not MetalClad.

Note however, that both 3500A and 4000A designs remain available only as indoor construction. If an outdoor application is needed, the switchgear must be furnished in a power building

Second, we can now offer UL Labeling on both 3500A and 4000A standard designs. As with any request for UL Label, our ability to label a given section is restricted by the device content. If our Customer specifies certain devices which are not UL or UR labeled, then we cannot label the section containing those devices.

The POWER/VAC Application Guide, GET-6600F, will be revised in the near future to reflect this improvement.

## **SUBJECT # 4 – 1500MVA Power/VAC Switchgear – UL**

Another recent improvement in our product is that we have completed testing, and now have the ability to UL Label our 15KV-1500MVA Power/VAC offering. Note that C-H currently does not have UL capability on their 1500MVA rating.



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## SUBJECT # 5 – POWER/VAC Breaker Ratings, 63KA Breakers

Burlington can provide Power/VAC rated 63KA interrupting, for 7.2KV and 4.16KV rated switchgear, as well as 15KV. 15KV-1500MVA rated equipment utilizes our breaker that has been tested to 63KA I/C, at a 1.0 K factor, the new ANSI C37.06-1997 standards. Based on this testing, the breaker can be applied at any voltage less than or equal to 15KV, and still maintain the 63KA interrupting rating. Specifications requiring a 4160V-500MVA rating can now be quoted.

I have included a table reflecting the current GE Power/VAC Breaker Ratings for your use. The POWER/VAC Application Guide, GET-6600F, will be revised in the near future to reflect this improvement.

## SUBJECT # 6 – POWER/VAC Breaker Enhanced Features

For our customers that utilize our roll-in breaker design, we have several optional enhancements that will improve breaker manipulation.

- First is a modified undercarriage, that places larger wheels on the front, in an “outrigger” position. This greatly improves the ease with which the breaker can be moved, and rolled in and out of the the compartment.
- Second is what we call a “bicycle handle”. This handle assembly is attached to the breaker front cover, and provides increased leverage for moving and pulling out the breaker. Note the handle does restrict the location of devices on the compartment door, so this is best applied on designs with the devices located on the upper compartment door.
- The last option, which works great with the bicycle handle, is the “interlock lift handle”. This assembly also attaches to the breaker front cover, and with one hand, an operator can raise both left and right side racking engagement levers, allowing one person to pull the breaker out of the compartment with ease.

See attached picture detailing these options. Each of these features can be added to roll-in breakers, to improve your customer’s Power/VAC experience. Contact your Quotation Team for pricing.



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Power/VAC Breakers Symmetrical Ratings Basis ANSI C37.06 (1987)

Identification		Rated Values							Related Required Capabilities					
Nominal rms Voltage Class (kV)	Nominal 3-phase Class (MVA) (6)	Voltage		Insulation Level		Current		Rated Interrupting Time (Cycles) (9)	Rated Permissible Tripping Delay, Y (Seconds)	Rated Maximum rms Voltage Divided by K (kV)	Current Values			
		Rated Maximum rms Voltage (kV) (1)	Rated Voltage Range Factor, K (2)	Rated Withstand Test Voltage		Continuous rms Current Rating at 60Hz (amperes) (7) & (8)	Short Circuit rms Current Rating (at Rated Max. kV) (kA) (3) (4)				Maximum Symmetrical Interrupting Capability (kA)	3 Sec Short time Current (kA)	Closing and Latching Capability rms Current (kA)	Close and Latch Peak 2.7K x short circuit current rating (kA)
				Low Frequency rms Voltage (kV)	Crest Impulse Voltage (kV)									
4.16	250	4.76	1.24	19	60	1200	29	5	2	3.85	36	36	58	97
						2000								
						3000								
						3500								
						4000								
	350	4.76	1.19	19	60	1200	41	5	2	4.0	49	49	78	132
						2000								
						3000								
						3500								
						4000								
	500 (6)	4.76	1.00	19	60	1200	63	5	2	4.76	63	63	101	164
						2000								
3000														
3500														
4000														
7.2	500	8.25	1.25	36	95	1200	33	5	2	6.6	41	41	66	111
						2000								
						3000								
						3500								
						4000								
13.8	500	15	1.30	36	95	1200	18	5	2	11.5	23	23	37	63
						2000								
						3000								
						3500								
						4000								
13.8	750	15	1.30	36	95	1200	28	5	2	11.5	36	36	58	98
						2000								
						3000								
						3500								
						4000								
13.8	1000	15	1.30	36	95	1200	37	5	2	11.5	48	48	77	130
						2000								
						3000								
						3500								
						4000								
13.8	1500 (6)	15	1.00	36	95	1200	63	5	2	15	63	63	101	164
						2000								
						3000								
						3500								
						4000								

**Notes:**

- (1) Maximum voltage for which the breaker is designed and the upper limit for operation.
- (2) K is the ratio of the maximum voltage to the lower limit of the range of operating voltage in which the required symmetrical and asymmetrical interrupting capabilities vary in inverse proportion to the operating voltage.
- (3) To obtain the required symmetrical interrupting capability of a circuit breaker at an operating voltage between 1/K times rated maximum voltage and rated maximum voltage, the following formula shall be used: Required Symmetrical Interrupting Capability = Rated Short-Circuit Current X  $\frac{\text{Rated Maximum Voltage}}{\text{Operating Voltage}}$
- For operating voltages below 1/K times rated maximum voltage, the required symmetrical interrupting capability of the circuit breaker shall be equal to K times the rated short-circuit current.
- (4) With the limitation stated in 5.10 of ANSI-C37.04-1991, all values apply for polyphase and line-to-line faults. For single phase-to-phase faults, the specific conditions stated in 5.10.2.3 of ANSI-C37.04-1991 apply.
- (5) Current values in this column are not to be exceeded even for operating voltages below 1/K times maximum voltage.
- (6) MVA Class listed for reference only. Note 4160V-500MVA and 13.8KV-1500MVA are not listed as preferred ratings according to table 2.1 of ANSI-C37.06-1987. For these ratings the Short Time current is on a 2 sec basis, and the peak C&L is 2.6 X S/C rating.
- (7) 3500A is indoor construction only.
- (8) 4000A is forced-air cooled, and indoor construction only.
- (9) 3 cycle interrupting ratings are available, consult Factory.



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