

®

Switchgear - like it used to be



to 15kV-63kA-5000 amps
38kV-44kA-3000 amps

America's Most Rugged
medium voltage breaker

CITADEL

Start at the TOP and work your way UP



Draw-Out and Fixed
Every imaginable C 37.09 and C37.013 application



Engineered for integration; Citadel® Switchgear allows pick & place in a shift.

Controls, protection and SCADA are marshaled to a common pre-wired, pre-tested cabinet for speedy on site conduit connections and startup.



Transformer Primary Protection Unit to 38kV - 2,000 amps

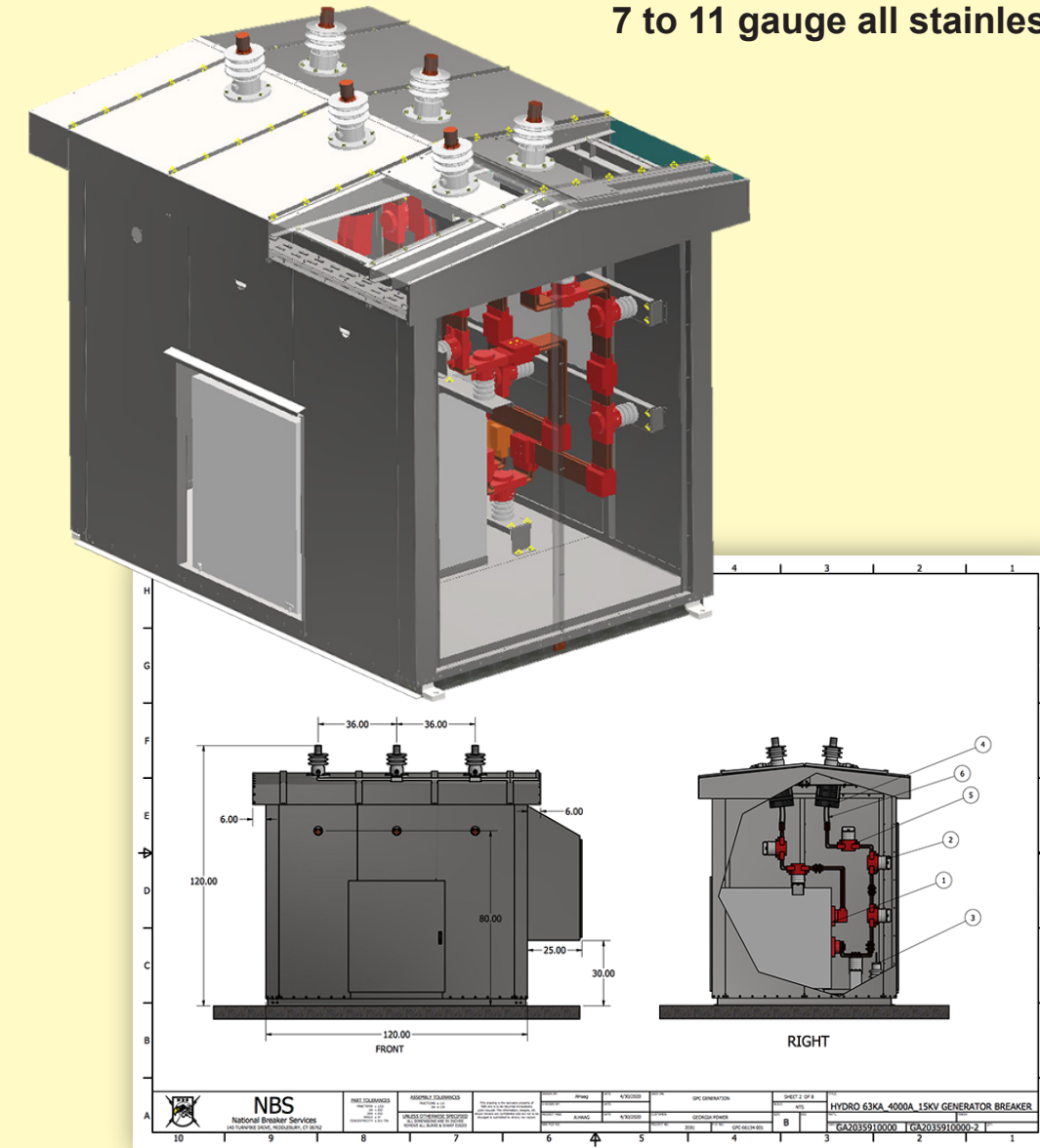
- NEMA 3R or NEMA 1 - 11 gauge steel (exceptionally compact footprint)
- Short circuit protection to 63 kA Sym
- Visible disconnect switch isolation
- Full draw-out PTs
- Touch-safe primary hammerhead connections
- Hammerhead optional capacitive LEDs
- Backfeed / Voltage present monitor
- Metering to revenue grade accuracies
- Dual 50/51 - 100% redundant back up
- Optional protective functions; 87 - 86 - 81 O/U - 67 - 59/27 - 32
- SCADA - Ethernet - 61850 and more



TPPU

OCB Replacement - Hydro 4000Amp GCB

7 to 11 gauge all stainless steel enclosure

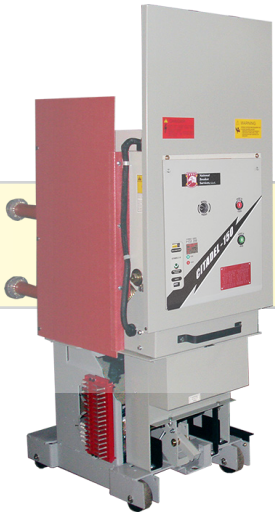


- One of a dozen (12) hydro main GCB units for a Premier South East USA Utility
- 15 kV - 4,000 amp - 63 kA C 37-013 breakers, bus and roof bushings
- Draw-out with remote rack and fork truck mobility platform.
- Entire structure designed to sit exactly on the same pad as the original OCB, Control box directly above existing conduit.
- Roof bushings align with original OCBs so overhead steel and bus was fully maintained
- C-800 CTs - 4 / Phase
- Built in On-Line Thermal and PD monitoring

®

Roll-in Replacement - Vacuum Conversions

GE - Westinghouse - ITE - Siemens (Allis Chalmers) - McGraw - Federal Pacific



FA

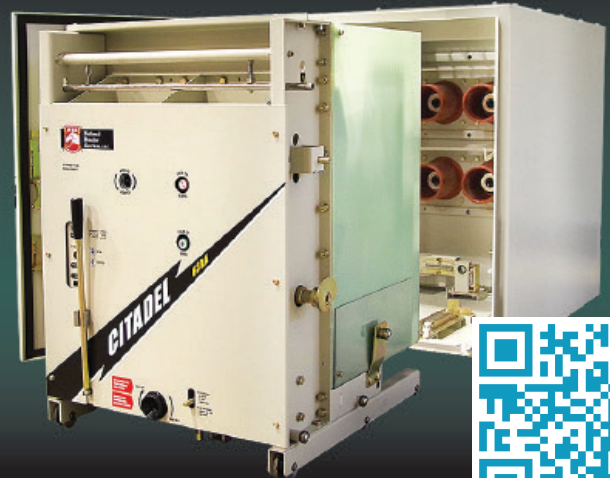
Generator Breakers

No Fans Needed

For 7E-Fleet Life Extension



Retrofit



Retrofit



Click for
TEST video

Click for
more info

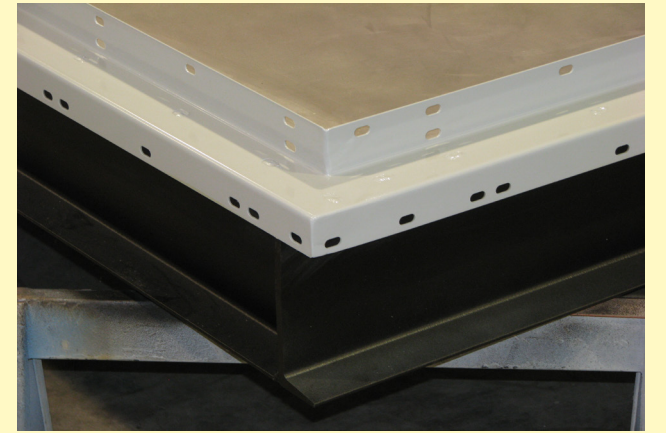
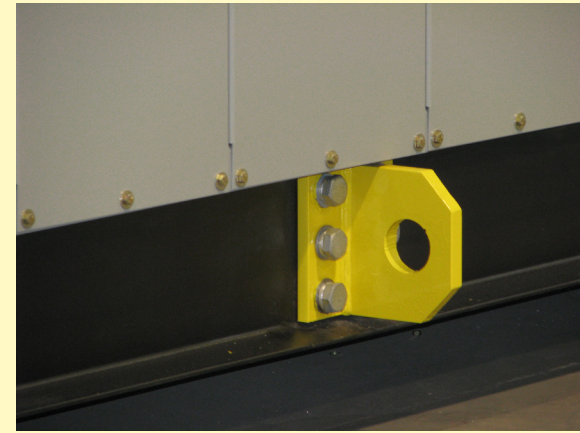
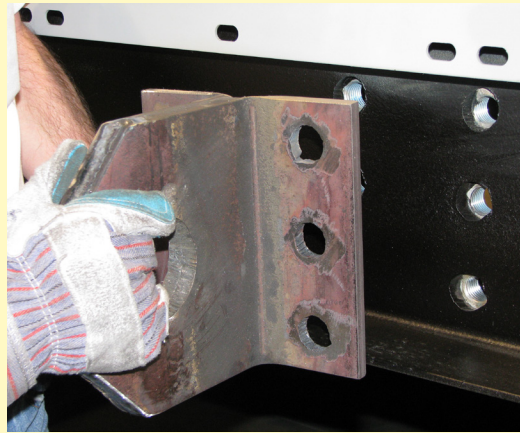
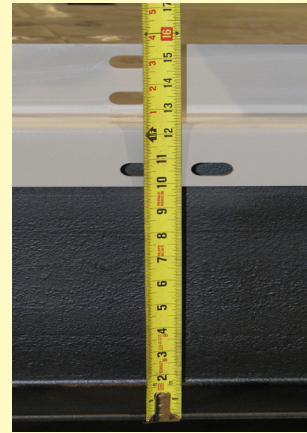


For more info: www.nationalbreakerservices.com

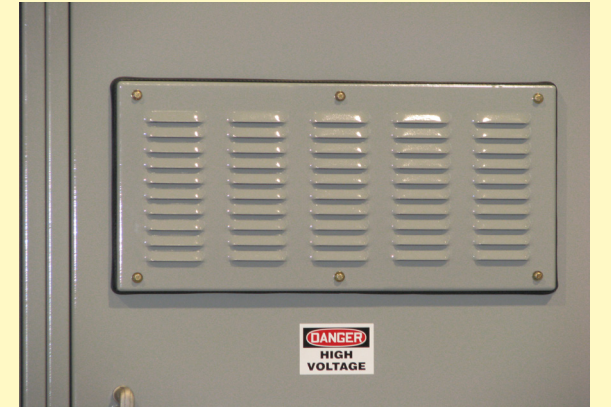


**National
Breaker
Services, LLC**

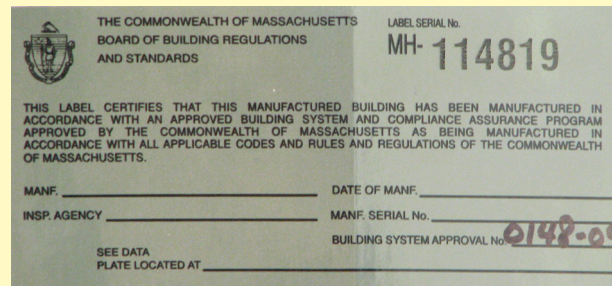
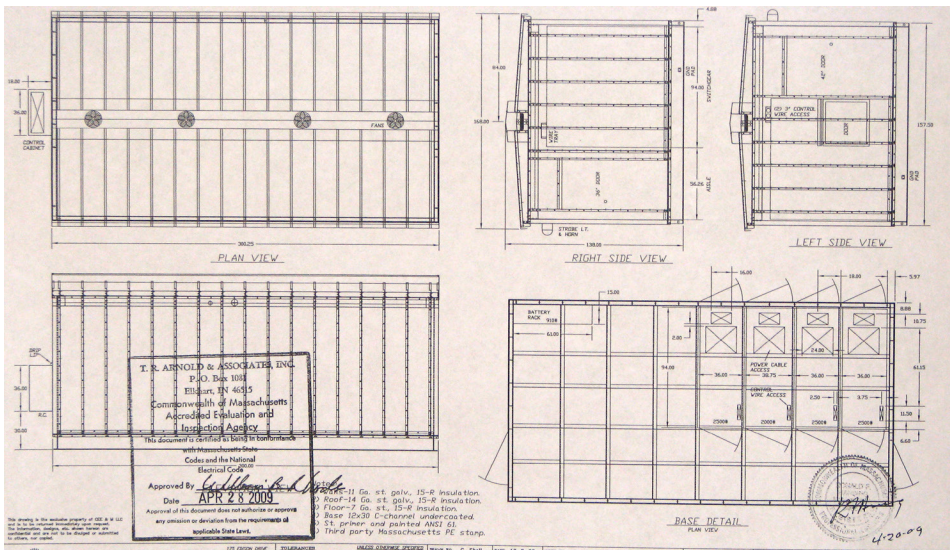
Phone: (203) 756-2524 x304 / (914) 968-4440 - technical sales
Toll Free: 888-8CITADEL (888-8248233)
140 Turnpike Drive Middlebury CT 06762
sales@nationalbreaker.com



Great things sit on solid foundations
Non-corroding stainless steel drip edges insure long life and exceptional wall underpinning



One stop wire spot Top of the line components Tamper proof door seating No outage filter changes

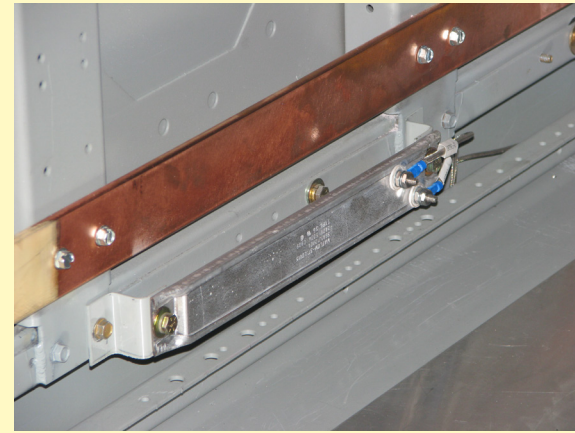
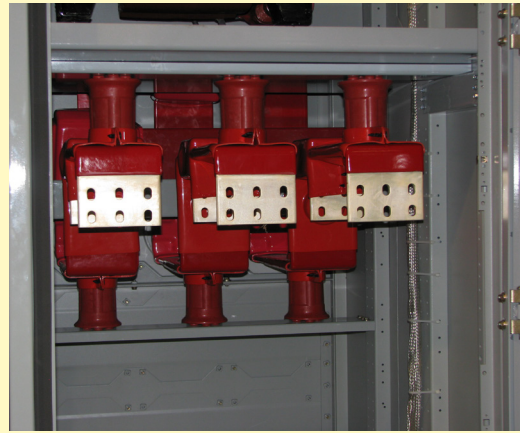
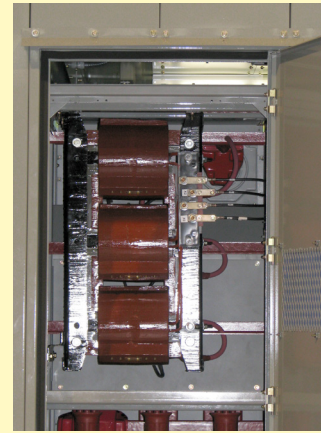


MASSACHUSETTS DATA PLATE ADDENDUM	
Water Connection Directions	N/A
Drain Connection Directions	N/A
Floor Loads: Live	50 psf/100psf S.G. Area Dead: 10 psf
Electrical Instructions:	Dwg. 080012-E001 thru E012 & C001 - C007
Electrical Warning	DANGER HIGH VOLTAGE
Methods of Assembly or Joining Multiple Units	N/A
Height & Story Limitations	1 story
Floor Area	14' x 25'
Min. Side Yard Required for Fire Rating	10ft.

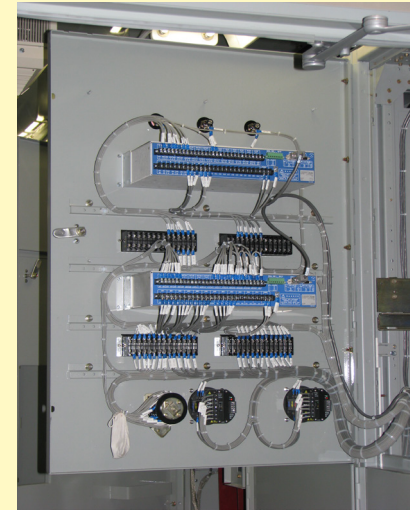
MANUFACTURER'S DATA PLATE		FACTORY INSTALLED EQUIPMENT	
EQUIPMENT	MANUFACTURER	MODEL NO.	
Heating	Dayton	2YU65	
Cooling			
Water Heats			
Dish Washers			
Disposal			
Hydro-Massage Tubs			
Transfer Switch	Eaton	100A	
Fire Alarm Panel	Notifier	NFS 320	
Battery Charger	SENS	120-016	
Shipping Weights		60.000#	

Engineering for every environment - 3rd Party Certification for every need





Enclosures can hang 1,000 lb. CPT epoxy copper bus – stand offs as specified – custom boots – wireways for total access



Citadel breakers to 15kV, 63 kA 5,000 amps & 38 kV, 44 kA 3,000 amps NO FANS



Every option for batteries including seismic - superb signage

TEST REPORT



2019TC00069 1/54

CLASSIFICATION Performance Test

TEST OBJECT Three phase withdrawable vacuum circuit-breaker in a test rig

DESIGNATION CITADEL15.4000.63
16 kV 4 000 A 63 kA 60 Hz

RECEIPT No. TRD18C00569

APPLICANT NATIONAL BREAKER SERVICES LLC
140 Turnpike Drive, Middlebury, Connecticut USA

MANUFACTURER NATIONAL BREAKER SERVICES LLC
140 Turnpike Drive, Middlebury, Connecticut USA

DATE OF TESTS 2018-09-04 ~ 2018-09-07

DATE OF ISSUE 2019-03-14

The tests have been carried out in accordance with applicant's instructions. Test procedure and test parameters were based on IEEE Std C37.09b:2010, subclause 4.8.3.2(T100s), 4.8.3.3(T100a), 4.8.3.4(T100s 1Ph and T100a 1Ph).

This Test Report has been issued by KERI.

The test results are shown in the records of tests with the performance of the test object and the observations made during the tests. The oscillograms are attached hereto.

The Test Report applies only to the test object. The responsibility for conformity of any apparatus having the same designations with that tested rests with the Manufacturer.

Only integral reproduction of this Report is permitted without written permission from KERI. Electronic copies in PDF-format or scanned version of this Report may be available and have the status "for information only". The sealed version of the Report is the only valid version.

TOTAL No. OF PAGES (54) : records (15), photographs (4), circuit diagrams (2), drawings & descriptions (1), attachments(0), oscillograms (32)



Prepared by Kim, Seon-Ho

Approved by (Technical manager) Lee, Dong-Jun

FOR INFORMATION ONLY
President Choe, Gyu-Ho

KOREA ELECTROTECHNOLOGY RESEARCH INSTITUTE

Changwon Headquarters
12 Bulmoean-ro 10-beon-gil, Seongsan-gu, Changwon, Gyeongnam-do
TEL. +82 55 280 1114, FAX. +82 55 280 1512

Ansan Branch
111, Hangeul-ro, Sangnok-gu, Ansan, Gyeonggi-do
TEL. +82 31 8040 4404, FAX. +82 31 8040 4499

* Verification Code : UQLO-9071 (<http://troa.keri.re.kr>)

DF-CA-21/10/14

2019TC00069 8/54

3 Short-circuit current interrupting tests (T100s)

Test requirements	
Recovery voltage	15.0 kV
TRV	$u_c = 25.7$ kV, $t_b = 66$ μ s, $t_d = 10$ μ s, RRRV = 0.39 kV/ μ s
Test current	Making = 163.8 kA, Breaking = 63 kA
Test frequency	60 Hz
Control voltage	Close : DC 100 V, Open : DC 70 V
Operating sequence	O - 0.3 s - CO - 3 min - CO

Test results									
Condition before test	New and clean Serial number : 1807021 Resistance : phase A-21.6 μ Ω , phase B-21.6 μ Ω , phase C-21.5 μ Ω							Test circuit : Fig. HP01	
Test number	Operation	Recovery voltage (phase to earth) kV	Test current			Arcing time ms	Break time ms	TRV peak kV	Remarks
			Making kA	Breaking kA	%DC %				
HPC 18-325-012	O	8.7	-	65.4	<20	14.1	53.1	-14.8	
		8.7		65.8		10.2	49.2	+26.0	
		8.7		65.4		14.1	53.1	+15.0	
HPC 18-325-012	0.3 s CO	8.8	-150.9	65.9	<20	18.3	59.9	+28.6	
		8.7	+65.8	66.6	<20	18.3	59.9	+12.5	
		8.8	+179.6	65.9		14.6	56.1	+25.7	
HPC 18-325-013	CO	8.8	-131.5	63.2	<20	7.2	48.9	-25.9	
		8.7	+51.1	64.0	<20	11.5	53.1	-15.5	
		8.8	+168.7	63.2	<20	11.5	53.1	+15.6	
Condition during and after test	Test object normally operated and showed no external damages. * Closing and latching capability was demonstrated with current duration of 10.0 cycles. Resistance : phase A-21.1 μ Ω , phase B-21.2 μ Ω , phase C-20.7 μ Ω								

FOR INFORMATION ONLY

