



H₂b

ANALYTICAL SERVICES
INCORPORATED

Dissolved Gas Analysis

Doug Stoneback
Miller Bros.

301 Alan Wood Rd.
Conshohocken, PA 19428

Location : Binghamton Cogen
Bank & Phase : GSU Main Xfmr
Serial Number : SNL-5812
Manufacturer : ABB
Equipment Type : Transformer
Model :

Date : 01-09-2025
Report Number : 4130583
P.O. Number :
Year of Mfg. :
kV Rating : 115 Kva
Breathing :
Cooling :
Fluid type : Mineral Oil
Fluid Volume :

Sample Date :	1/2/2025	8/20/2004	6/28/2004	4/7/2004	12/5/2003	7/30/2003
Laboratory No. :	4130583	4033852	4032974	4031562	4029901	4027230
Container No. :						
Temperature :	NA	40 C	38 C	30 C		40 C
Hydrogen (ppm) :	98	3	0	4	0	2
Methane (ppm) :	8	5	8	2	8	2
Ethane (ppm) :	19	24	28	1	2	2
Ethylene (ppm) :	10	10	23	16	9	8
Acetylene (ppm) :	0	11	23	23	28	30
Carbon monoxide (ppm) :	129	35	29	29	28	26
Carbon dioxide (ppm) :	2079	975	1440	1045	1403	1099
Nitrogen (ppm) :	97182	95183	93827	91179	102391	91215
Oxygen (ppm) :	2577	4922	4790	4809	4959	3224
Total (ppm) :	102102	101168	100168	97108	108828	95608
TDCG (ppm) :	264	88	112	75	76	70
TDCG Rate (ppm/day) :	0.0	-0.4	0.4	0.0	0.0	-0.2
TDCG (gallons) :	1036					
TDHHG (ppm) :	38	39	59	20	20	12
ETCG (% in blanket) :	0.27	0.04	0.03	0.03	0.02	0.03
CH ₄ / H ₂ :	0.09	1.50	9999.99	0.55	9999.99	1.39
C ₂ H ₂ / C ₂ H ₄ :	0.04	1.12	1.01	1.41	2.98	3.83
C ₂ H ₂ / CH ₄ :	0.05	2.24	3.00	11.20	3.43	13.61
C ₂ H ₆ / C ₂ H ₂ :	43.09	2.25	1.17	0.06	0.07	0.06
C ₂ H ₄ / C ₂ H ₆ :	0.53	0.40	0.85	10.94	4.73	4.51
CO ₂ / CO :	16.08	27.72	48.89	36.21	49.65	42.76
O ₂ / N ₂ :	0.03	0.05	0.05	0.05	0.05	0.04

Dissolved Gas Diagnostics

IEEE C57.104-2019 Status : 2

Key Gas Method : All gases are within normal limits

Doernenburg Ratios : Not in table

Rogers Ratios (3) : Low-energy density arcing - Partial discharge Note that some ratio gases are below meaningful thresholds.

Rogers Ratios (4) : Not in table. Note that some ratio gases are below meaningful thresholds.

CO₂ / CO : Higher than normal temperature in insulation

Heat Index : 0.00

TDCG Level (ppm) : 264

Sampling Interval : Six months

Operating Procedure : Transformers with DGA Status 2 are considered as possibly suspicious and warrant additional investigation in function of the possible fault diagnostic. Increased sampling frequency should be maintained or started. Establishing multi-point rates is recommended if not already available.

Comments : Continue normal operation.



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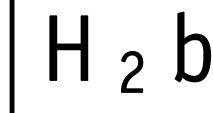
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TJ|H2b Analytical Services issues reports in a simplified manner; not all ASTM and ISO/IEC 17025 requirements are addressed in this report; however, all required information is retained and available upon request. TJ|H2b does not perform sampling services and provides results for tests performed on samples as received. TJ|H2b assumes no responsibility for the quality or condition of the samples it receives or for the accuracy of any information provided with those samples. Test reports shall not be reproduced, except in full, without prior written consent of TJ|H2b.



ANALYTICAL SERVICES
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Insulating Fluid Evaluation

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Date : 1/9/2025
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kV Rating : 115 Kva
Breathing :
Cooling :
Fluid type : Mineral Oil
Fluid Volume :

Sample Date : 1/2/2025
Laboratory No. : 4130583
Container No. :
Temperature : NA

D1533	Moisture	(ppm) :	702
D971	Interfacial Tension	(dynes/cm) :	27.1
D974	Acid Number	(mg KOH/g) :	0.07
D1500	Color Number	:	1.5
D1524	Visual Examination	:	Clear & Bright
D877	Dielectric BV	(kV) :	
D1816	Dielectric BV	(kV) :	NC
D924	Power Factor	(% at 25 C) :	NC
D924	Power Factor	(% at 100 C) :	
D2668	Oxidation Inhibitor	(%) :	
D1298	Specific Gravity	:	0.878
D88	Viscosity	(SUS) :	
D97	Pour Point	(C) :	
D92	Flash Point	(C) :	
D92	Fire Point	(C) :	
D1807	Refractive Index	:	
D1275B	Corrosive Sulfur	:	

Insulating Fluid Diagnostics

	<u>ASTM D3487</u>	<u>IEEE Group I</u>	<u><69</u>	<u>>69<288</u>	<u>>345</u>	<u>IEEE Group II</u>	<u>IEEE Group III</u>
Moisture :	35 max	Warning	35 max	25 max	20 max		
Interfacial Tension :	40 min	Warning	24 min	26 min	30 min	Acceptable	24 min
Acid Number :	0.03 max	Acceptable	0.2 max	0.2 max	0.1 max	Acceptable	0.2 max
Color Number :	0.5 max					Acceptable	0.5 max
Visual Examination :	clear & bright						
Dielectric BV D877 :	30 min		26 min	26 min	26 min		
Dielectric BV D1816 :	28 min	Warning	23 min	26 min	26 min		
Power Factor @ 25 C :	0.05 max						
Power Factor @ 100 C :	0.30 max						
Oxidation Inhibitor :	0.3 max						
Specific Gravity :	0.91 max						
Viscosity @ 40 C :	66 max						
Pour Point :	-40 max						
Flash Point :	145 min						
Fire Point :							
Refractive Index :							
Corrosive Sulfur :	noncorrosive						
Comments :							