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|  | **HV WINDING** | **LV WINDING** |
| KV | 230 X 115 | 26.4Y/15.24 |
| MVA @ 55$C Rise | 36/48/60 | 36/48/60 |
| MVA @ 65$C Rise | 40.32/53.76/67.20 | 40.32/53.76/67.20 |
| TAPS | #2 of3.5 kV X #2 of 1.75 kV | #16 of 5/8% |
| BIL (Line Terminals) kV | 900 X 450 | 150 |
| BIL (Neutral Terminal) kV | - | 150 |

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| **LOSSES, EFFICIENCIES ANREGULATIONS** |
| Losses, efficiencies and regulations are calculated and reported for nominal ratings and are based on results of these tests. Three wattmeter method is utilized for measurement of three phase transformer losses. For three phase transformers, the resistance reported is the sum of the three phases at the nominal taps of the respective windings. |
| The error of the loss measurement system used to test this transformer is less than  0.77% for no load losses and  1.0% for load losses. The accuracy of our system is routinely verified in accordance with procedures outlined in the National Bureau of Standards Technical Note 1204. |
| All measured load losses are corrected for metering phase angle error due to load power factor of less than 0.03. This correction is per IEEE Std. C57.12.90-2015. |

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| **Losses &amp %Impedance** | **Reference Temp $C** | **230 kV to 26.4Y kV At 36 MVA** | | **115 kV to 26.4Y kV At 36 MVA** | |
| **Reported** | **Guaranteed** | **Reported** | **Guaranteed** |
| No Load Loss(Watts) | 20 | 22400 | 24500 | 22400 | 24500 |
| Load Loss(Watts) | 75 | 114200 | 126000 | 114900 | - |
| Total Loss(Watts) | 75 | 136600 | 150500 | 137300 | - |
| Positive Sequence Impedance | | 10.68 | 11.00 | 10.67 | - |

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| **CONTROL/AUXILIARY System Losses** | | |
| **CONTROL CIRCUIT AND COOLING DEVICES** | **WATTS** | |
| **Reported** | **Guaranteed** |
| ONAN | 1850 | 3000 |
| ONAN1 | 1850 | 3000 |
| ONAN2 | 1850 | 3000 |

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| **DEW POINT results prior to shipment:** | | | |
| Dew Point ($C) | - 30.68 | Core Temp ($C) | 55.1 |
| Tank Pressure (kPa) | -37.23 | Moisture (%) | 0.27 |

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| |  |  |  | | --- | --- | --- | | **% EFFICIENCIES at 75 $C** | | | |  | **SERIES** | **PARALLEL** | | 1/4 Load | 99.67 | 99.67 | | 1/2 Load | 99.67 | 99.67 | | 1/3 Load | 99.67 | 99.67 | | |  |  |  | | --- | --- | --- | | **% REGULATION at 75 $C** | | | |  | **SERIES** | **PARALLEL** | | @ 70% P.F. | 99.67 | 99.67 | | @ 80% P.F. | 99.67 | 99.67 | | @ 90% P.F. | 99.67 | 99.67 | |

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| **THERMAL TESTS** |
| Oil flow in windings: Non Directed |
| Harmonic Factor: Equal to or less than 5%. |
| Temperature Rises are in C winding temperature at instant of shutdown is corrected to oil stabilized condition. |
| To determine average winding rise, winding resistances were measured during the maximum nameplate MVA heatrun on all terminal pairs and the reported results for all heatruns are for the hottest pair. |
| Heat Run temperature Rise over Ambient (All temperatures measured in C) |

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| **Heatrun results are from duplicate unit, serial number WT05543.** | | | | | | | | | | |
| **cooling** | **MVA** | **Top Oil Rise** | **Btm Oil Rise** | **Average Winding Rise** | | | **Avg Amb Temp.** | **Hottest-Spot Winding Rise over Ambient Temp** | | **Total Losses (kW)** |
| **Gradient Current (Amps)** | **HV** | **XV** | **Guar** | **\*Calc** |
| ONAN | 36 | 43.1 | 24.9 | 45.6 | - | 24.3 | 23.4 | 70 | 143.2 | 96.9 |
| - | 42.8 | 56.8 | 788.9 |
| ONAN1 | 36 | 43.1 | 24.9 | 45.6 | - | 24.3 | 23.4 | 70 | 143.2 | 96.9 |
| - | 42.8 | 56.8 | 788.9 |
| Qty. of Radiators = 9 Radiators Qty. of Fans = 18 Fans | | | | | | | | | | |
| Heatrun Taps: E-N, HV SERIES | | | | | | | | | | |
| \*The maximum (hottest-spot) winding temperature rises above ambient temperature were determined per sub clause5.11.1.1 C of the IEEE Standard C57.12.00-2015. | | | | | | | | | | |

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| PD/RIV TEST RESULTS: An Enhancement Test was performed for 7200 cycles and followed by one hour test.PD/RIV test results are as follows: | | | | | | | | | |
| **HV PARALLEL CONNECTION** | | | | | | | | | |
| **HV(kV)** | **E(%)** | **Time(min)** | **RMS (V)(L-L)** | **H1** | | **H2** | | **H3** | |
| **(pC)** | **(µV)** | **(pC)** | **(µV)** | **(pC)** | **(µV)** |
| 10 | 0 | 4 | - | 9 | 8 | 9 | 10 | 11 | 234 |
|  | 0 | 4 | - | 9 | 8 |  | 10 | 11 | 234 |
|  | 0 | 4 | - | 9 | 8 |  | 10 | 11 | 234 |

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| PD/RIV TEST RESULTS: An Enhancement Test was performed for 7200 cycles and followed by one hour test.PD/RIV test results are as follows: | | | | | | | | | |
| **HV SERIES CONNECTION** | | | | | | | | | |
| **HV(kV)** | **E(%)** | **Time(min)** | **RMS (V)(L-L)** | **H1** |  | **H2** |  | **H3** |  |
| **(pC)** | **(µV)** | **(pC)** | **(µV)** | **(pC)** | **(µV)** |
| 10 | 0 | 4 | - | 9 | 8 | 9 | 10 | 78 | 9 |
|  | 0 | 4 | - | 9 | 8 |  | 10 | 78 | 9 |
|  | 0 | 4 | - | 9 | 8 |  | 10 | 78 | 9 |

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| **IMPULSE TESTS:ANSI Impulse tests successfully performed on terminals as listed:** | | | | |
|  | **HV Series** | **HV Parallel** | **XV** | **XO** |
| FW Test level (kV) | 900 | 450 | 150 | 150 |
| CW Test level (kV) | 900 | 450 | 150 | 150 |

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| **INSULATION RESISTANCE (MEGGER) TEST at 2.5 kV, DC** | |
| **Connections** | **Energize (Black)** |
| (HV + XV + YV) - GRND | 2340 |
| (HV + XV) – (YV + GRND) | 2340 |
| YV – (HV + XV + GRND) | 2410 |

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| **INDUCED VOLTAGE TEST: successfully performed at test levels listed below:** | | |
| **HV Parallel** | **HV (L-L) Voltage (kV)** | **LV (L-L) Voltage (kV)** |
| Rated Voltage of Induce test tap | 120.5 | 28.88 |
| Enhanced Level (7200 Cycles) | 120.5 | 28.88 |
| One hour Level | 120.5 | 28.88 |

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| **INDUCED VOLTAGE TEST: successfully performed at test levels listed below:** | | |
| **HV Series** | **HV (L-L) Voltage (kV)** | **LV (L-L) Voltage (kV)** |
| Rated Voltage of Induce test tap | 120.5 | 28.88 |
| Enhanced Level (7200 Cycles) | 120.5 | 28.88 |
| One hour Level | 120.5 | 28.88 |
| Enhanced Level (7200 Cycles) | 120.5 | 28.88 |

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| **APPLIED POTENTIAL TEST:Voltage applied to each winding with all other windings and tank grounded.** | | | | |
| **WindingTested** | **Config** | **NSV/BIL(kV)** | **AC Voltage Applied (kV)** | **Duration** |
| HV Series | Delta | NSV 230 | 345 | 60 seconds |
| HV Series | Delta | NSV 230 | 345 | 60 seconds |
| HV Parallel | Delta | NSV 230 | 345 | 60 seconds |

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| **RatioTest** | | | | | | | | |
| Ratio, polarity and phase rotation test per IEEE C57.12.00 requirements were performed;all ratios arewithin ±0.5% of indicated nameplate ratios. Phase rotation and polarities are correct | | | | | | | | |
| **138.0 KV/26.4Y KV** | | | | | | | | |
|  | | | **Tested** | | | **Error From NP** | | |
| **Tap** | | **NamePlates** | **PHASE** | | | **PHASE** | | |
| **HV** | **XV** | **AØ** | **BØ** | **CØ** | **AØ** | **BØ** | **CØ** |
| A | N | 9.513 | 9.5255 | 9.5290 | 9.5292 | -0.13 | -0.17 | -0.17 |
| B | N | 9.284 | 9.2921 | 9.2956 | 9.2950 | -0.09 | -0.12 | -0.12 |
| C | N | 9.054 | 9.0626 | 9.0629 | 9.0629 | -0.09 | -0.10 | -0.10 |
| D | N | 8.824 | 8.8288 | 8.8294 | 8.8292 | -0.05 | -0.06 | -0.06 |
| E | N | 8.595 | 8.5978 | 8.5972 | 8.5974 | -0.03 | -0.03 | -0.03 |
| C | 16R | 8.231 | 8.2410 | 8.2410 | 8.2410 | -0.12 | -0.12 | -0.12 |
| C | 15R | 8.276 | 8.2874 | 8.2871 | 8.2866 | -0.14 | -0.13 | -0.13 |
| C | 14R | 8.325 | 8.3346 | 8.3344 | 8.3356 | -0.12 | -0.11 | -0.13 |
| C | 13R | 8.375 | 8.3817 | 8.3826 | 8.3829 | -0.08 | -0.09 | -0.09 |
| C | 12R | 8.422 | 8.4302 | 8.4313 | 8.4307 | -0.10 | -0.11 | -0.10 |
| C | 11R | 8.470 | 8.4800 | 8.4799 | 8.4813 | -0.12 | -0.12 | -0.13 |
| C | 10R | 8.521 | 8.5298 | 8.5292 | 8.5302 | -0.10 | -0.10 | -0.11 |
| C | 9R | 8.570 | 8.5798 | 8.5796 | 8.5800 | -0.11 | -0.11 | -0.12 |
| C | 8R | 8.623 | 8.6313 | 8.6309 | 8.6313 | -0.10 | -0.09 | -0.10 |
| C | 7R | 8.673 | 8.6826 | 8.6827 | 8.6828 | -0.11 | -0.11 | -0.11 |
| C | 6R | 8.727 | 8.7350 | 8.7347 | 8.7347 | -0.09 | -0.09 | -0.09 |
| C | 5R | 8.778 | 8.7880 | 8.7878 | 8.7878 | -0.11 | -0.11 | -0.11 |
| C | 4R | 8.833 | 8.8416 | 8.8416 | 8.8413 | -0.10 | -0.10 | -0.09 |
| C | 3R | 8.889 | 8.8960 | 8.8960 | 8.8958 | -0.08 | -0.08 | -0.08 |
| C | 2R | 8.942 | 8.9509 | 8.9509 | 8.9506 | -0.10 | -0.10 | -0.10 |
| C | 1R | 8.996 | 9.0064 | 9.0066 | 9.0066 | -0.12 | -0.12 | -0.12 |
| C | 1L | 9.109 | 9.1200 | 9.1200 | 9.1198 | -0.12 | -0.12 | -0.12 |
| C | 2L | 9.169 | 9.1777 | 9.1774 | 9.1776 | -0.09 | -0.09 | -0.09 |
| C | 3L | 9.225 | 9.2363 | 9.2357 | 9.2357 | -0.12 | -0.12 | -0.12 |
| C | 4L | 9.286 | 9.2956 | 9.2956 | 9.2950 | -0.10 | -0.10 | -0.10 |
| C | 5L | 9.344 | 9.3552 | 9.3552 | 9.3558 | -0.12 | -0.12 | -0.13 |
| C | 6L | 9.407 | 9.4163 | 9.4161 | 9.4160 | -0.10 | -0.10 | -0.10 |
| C | 7L | 9.466 | 9.4779 | 9.4779 | 9.4782 | -0.13 | -0.13 | -0.13 |

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| **RatioTest** | | | | | | | | |
| Ratio, polarity and phase rotation test per IEEE C57.12.00 requirements were performed;all ratios arewithin ±0.5% of indicated nameplate ratios. Phase rotation and polarities are correct | | | | | | | | |
| **138.0 KV/26.4Y KV** | | | | | | | | |
|  | | | **Tested** | | | **Error From NP** | | |
| **Tap** | | **NamePlates** | **PHASE** | | | **PHASE** | | |
| **HV** | **XV** | **AØ** | **BØ** | **CØ** | **AØ** | **BØ** | **CØ** |
| C | 8L | 9.530 | 9.5405 | 9.5408 | 9.5407 | -0.11 | -0.11 | -0.11 |
| C | 9L | 9.592 | 9.6037 | 9.6034 | 9.6034 | -0.12 | -0.12 | -0.12 |
| C | 10L | 9.657 | 9.6678 | 9.6679 | 9.6679 | -0.11 | -0.11 | -0.11 |
| C | 11L | 9.720 | 9.7328 | 9.7322 | 9.7333 | -0.13 | -0.13 | -0.14 |
| C | 12L | 9.788 | 9.8016 | 9.7990 | 9.8007 | -0.14 | -0.11 | -0.13 |
| C | 13L | 9.853 | 9.8686 | 9.8669 | 9.8660 | -0.16 | -0.14 | -0.13 |
| C | 14L | 9.922 | 9.9348 | 9.9343 | 9.9348 | -0.13 | -0.12 | -0.13 |
| C | 15L | 9.988 | 10.004 | 10.004 | 10.004 | -0.16 | -0.16 | -0.16 |
| C | 16L | 10.060 | 10.073 | 10.074 | 10.075 | -0.13 | -0.14 | -0.15 |

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| **138.0 KV/26.4Y KV** | | | | | | | | |
|  | | | **Tested** | | | **Error From NP** | | |
| **Tap** | | **NamePlates** | **PHASE** | | | **PHASE** | | |
| **HV** | **XV** | **AØ** | **BØ** | **CØ** | **AØ** | **BØ** | **CØ** |
| A | 9R | 9.005 | 9.0185 | 9.0212 | 9.0215 | -0.15 | -0.18 | -0.18 |
| A | 8R | 9.060 | 9.0723 | 9.0736 | 9.0763 | -0.14 | -0.15 | -0.18 |
| A | 8L | 10.014 | 10.027 | 10.030 | 10.032 | -0.13 | -0.16 | -0.18 |
| A | 9L | 10.078 | 10.096 | 10.097 | 10.099 | -0.18 | -0.19 | -0.21 |
| B | 9R | 8.788 | 8.7974 | 8.8006 | 8.8006 | -0.11 | -0.14 | -0.14 |
| B | 8R | 8.841 | 8.8506 | 8.8540 | 8.8542 | -0.11 | -0.15 | -0.15 |
| B | 8L | 9.772 | 9.7829 | 9.7869 | 9.7862 | -0.11 | -0.15 | -0.15 |
| B | 9L | 9.835 | 9.8471 | 9.8496 | 9.8518 | -0.12 | -0.15 | -0.17 |
| D | 9R | 8.353 | 8.3613 | 8.3572 | 8.3611 | -0.10 | -0.05 | -0.10 |
| D | 8R | 8.404 | 8.4098 | 8.4097 | 8.4095 | -0.07 | -0.07 | -0.07 |
| D | 8L | 9.289 | 9.2956 | 9.2952 | 9.2958 | -0.07 | -0.07 | -0.07 |
| D | 9L | 9.348 | 9.3585 | 9.3590 | 9.3584 | -0.11 | -0.12 | -0.11 |
| E | 9R | 8.135 | 8.1402 | 8.1402 | 8.1400 | -0.06 | -0.06 | -0.06 |
| E | 8R | 8.185 | 8.1889 | 8.1882 | 8.1887 | -0.05 | -0.04 | -0.05 |
| E | 8L | 9.047 | 9.0523 | 9.0521 | 9.0526 | -0.06 | -0.06 | -0.06 |

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| **RatioTest** | | | | | | | | |
| Ratio, polarity and phase rotation test per IEEE C57.12.00 requirements were performed;all ratios arewithin ±0.5% of indicated nameplate ratios. Phase rotation and polarities are correct | | | | | | | | |
| **138.0 KV/26.4Y KV** | | | | | | | | |
|  | | | **Tested** | | | **Error From NP** | | |
| **Tap** | | **NamePlates** | **PHASE** | | | **PHASE** | | |
| **HV** | **XV** | **AØ** | **BØ** | **CØ** | **AØ** | **BØ** | **CØ** |
| E | 9L | 9.105 | 9.1108 | 9.1104 | 9.1121 | -0.06 | -0.06 | -0.08 |

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| **138.0 KV/13.2Y KV** | | | | | | | | |
|  | | | **Tested** | | | **Error From NP** | | |
| **Tap** | | **NamePlates** | **PHASE** | | | **PHASE** | | |
| **HV** | **XV** | **AØ** | **BØ** | **CØ** | **AØ** | **BØ** | **CØ** |
| A | N | 19.026 | 19.048 | 19.054 | 19.059 | -0.12 | -0.15 | -0.17 |
| B | N | 18.567 | 18.584 | 18.590 | 18.590 | -0.09 | -0.12 | -0.12 |
| C | N | 18.108 | 18.126 | 18.126 | 18.124 | -0.10 | -0.10 | -0.09 |
| D | N | 17.649 | 17.658 | 17.658 | 17.660 | -0.05 | -0.05 | -0.06 |
| E | N | 17.189 | 17.196 | 17.195 | 17.195 | -0.04 | -0.03 | -0.03 |
| C | 16R | 16.462 | 16.481 | 16.479 | 16.481 | -0.12 | -0.10 | -0.12 |
| C | 15R | 16.553 | 16.576 | 16.570 | 16.576 | -0.14 | -0.10 | -0.14 |
| C | 14R | 16.645 | 16.667 | 16.671 | 16.670 | -0.13 | -0.16 | -0.15 |
| C | 13R | 16.750 | 16.768 | 16.763 | 16.767 | -0.11 | -0.08 | -0.10 |
| C | 12R | 16.844 | 16.863 | 16.861 | 16.865 | -0.11 | -0.10 | -0.12 |
| C | 11R | 16.940 | 16.961 | 16.962 | 16.959 | -0.12 | -0.13 | -0.11 |
| C | 10R | 17.037 | 17.062 | 17.059 | 17.060 | -0.15 | -0.13 | -0.13 |
| C | 9R | 17.147 | 17.160 | 17.160 | 17.159 | -0.08 | -0.08 | -0.07 |
| C | 8R | 17.246 | 17.261 | 17.263 | 17.261 | -0.09 | -0.10 | -0.09 |
| C | 7R | 17.346 | 17.365 | 17.365 | 17.365 | -0.11 | -0.11 | -0.11 |
| C | 6R | 17.447 | 17.470 | 17.470 | 17.470 | -0.13 | -0.13 | -0.13 |
| C | 5R | 17.562 | 17.576 | 17.576 | 17.575 | -0.08 | -0.08 | -0.07 |
| C | 4R | 17.666 | 17.683 | 17.683 | 17.682 | -0.10 | -0.10 | -0.09 |
| C | 3R | 17.771 | 17.792 | 17.791 | 17.791 | -0.12 | -0.11 | -0.11 |
| C | 2R | 17.878 | 17.901 | 17.901 | 17.901 | -0.13 | -0.13 | -0.13 |
| C | 1R | 17.999 | 18.013 | 18.013 | 18.013 | -0.08 | -0.08 | -0.08 |
| C | 1L | 18.218 | 18.240 | 18.239 | 18.239 | -0.12 | -0.12 | -0.12 |
| C | 2L | 18.330 | 18.355 | 18.355 | 18.356 | -0.14 | -0.14 | -0.14 |

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| **RatioTest** | | | | | | | | |
| Ratio, polarity and phase rotation test per IEEE C57.12.00 requirements were performed;all ratios arewithin ±0.5% of indicated nameplate ratios. Phase rotation and polarities are correct | | | | | | | | |
| **138.0 KV/13.2Y KV** | | | | | | | | |
|  | | | **Tested** | | | **Error From NP** | | |
| **Tap** | | **NamePlates** | **PHASE** | | | **PHASE** | | |
| **HV** | **XV** | **AØ** | **BØ** | **CØ** | **AØ** | **BØ** | **CØ** |
| C | 3L | 18.457 | 18.472 | 18.468 | 18.472 | -0.08 | -0.06 | -0.08 |
| C | 4L | 18.572 | 18.590 | 18.589 | 18.590 | -0.10 | -0.09 | -0.10 |
| C | 5L | 18.688 | 18.711 | 18.710 | 18.710 | -0.12 | -0.12 | -0.12 |
| C | 6L | 18.806 | 18.833 | 18.832 | 18.832 | -0.14 | -0.14 | -0.14 |
| C | 7L | 18.940 | 18.956 | 18.955 | 18.956 | -0.08 | -0.08 | -0.08 |
| C | 8L | 19.061 | 19.081 | 19.081 | 19.081 | -0.10 | -0.10 | -0.10 |
| C | 9L | 19.183 | 19.208 | 19.206 | 19.207 | -0.13 | -0.12 | -0.13 |
| C | 10L | 19.307 | 19.335 | 19.334 | 19.334 | -0.15 | -0.14 | -0.14 |
| C | 11L | 19.449 | 19.465 | 19.464 | 19.465 | -0.08 | -0.08 | -0.08 |
| C | 12L | 19.576 | 19.597 | 19.597 | 19.597 | -0.11 | -0.11 | -0.11 |
| C | 13L | 19.705 | 19.731 | 19.731 | 19.729 | -0.13 | -0.13 | -0.12 |
| C | 14L | 19.836 | 19.866 | 19.865 | 19.864 | -0.15 | -0.15 | -0.14 |
| C | 15L | 19.985 | 20.002 | 20.002 | 20.003 | -0.09 | -0.09 | -0.09 |
| C | 16L | 20.120 | 20.143 | 20.143 | 20.143 | -0.11 | -0.11 | -0.11 |

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| **138.0 KV/13.2Y KV** | | | | | | | | |
|  | | | **Tested** | | | **Error From NP** | | |
| **Tap** | | **NamePlates** | **PHASE** | | | **PHASE** | | |
| **HV** | **XV** | **AØ** | **BØ** | **CØ** | **AØ** | **BØ** | **CØ** |
| A | 9R | 18.016 | 18.034 | 18.040 | 18.045 | -0.10 | -0.13 | -0.16 |
| A | 8R | 18.120 | 18.141 | 18.151 | 18.152 | -0.12 | -0.17 | -0.18 |
| A | 8L | 20.028 | 20.052 | 20.060 | 20.060 | -0.12 | -0.16 | -0.16 |
| A | 9L | 20.156 | 20.187 | 20.196 | 20.191 | -0.15 | -0.20 | -0.17 |
| B | 9R | 17.581 | 17.595 | 17.601 | 17.600 | -0.08 | -0.11 | -0.11 |
| B | 8R | 17.683 | 17.702 | 17.708 | 17.708 | -0.11 | -0.14 | -0.14 |
| B | 8L | 19.544 | 19.566 | 19.572 | 19.572 | -0.11 | -0.14 | -0.14 |
| B | 9L | 19.670 | 19.691 | 19.699 | 19.700 | -0.11 | -0.15 | -0.15 |
| D | 9R | 16.712 | 16.722 | 16.722 | 16.722 | -0.06 | -0.06 | -0.06 |
| D | 8R | 16.808 | 16.819 | 16.819 | 16.819 | -0.07 | -0.07 | -0.07 |

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| **RatioTest** | | | | | | | | |
| Ratio, polarity and phase rotation test per IEEE C57.12.00 requirements were performed;all ratios arewithin ±0.5% of indicated nameplate ratios. Phase rotation and polarities are correct | | | | | | | | |
| **138.0 KV/13.2Y KV** | | | | | | | | |
|  | | | **Tested** | | | **Error From NP** | | |
| **Tap** | | **NamePlates** | **PHASE** | | | **PHASE** | | |
| **HV** | **XV** | **AØ** | **BØ** | **CØ** | **AØ** | **BØ** | **CØ** |
| D | 8L | 18.577 | 18.591 | 18.590 | 18.590 | -0.08 | -0.07 | -0.07 |
| D | 9L | 18.697 | 18.713 | 18.711 | 18.715 | -0.09 | -0.07 | -0.10 |
| E | 9R | 16.277 | 16.280 | 16.280 | 16.280 | -0.02 | -0.02 | -0.02 |
| E | 8R | 16.371 | 16.377 | 16.377 | 16.378 | -0.04 | -0.04 | -0.04 |
| E | 8L | 18.094 | 18.099 | 18.101 | 18.100 | -0.03 | -0.04 | -0.03 |
| E | 9L | 18.210 | 18.220 | 18.220 | 18.222 | -0.05 | -0.05 | -0.07 |

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| **69.0 KV/26.4Y KV** | | | | | | | | |
|  | | | **Tested** | | | **Error From NP** | | |
| **Tap** | | **NamePlates** | **PHASE** | | | **PHASE** | | |
| **HV** | **XV** | **AØ** | **BØ** | **CØ** | **AØ** | **BØ** | **CØ** |
| A | N | 4.757 | 4.7610 | 4.7630 | 4.7632 | -0.08 | -0.13 | -0.13 |
| B | N | 4.642 | 4.6448 | 4.6466 | 4.6470 | -0.06 | -0.10 | -0.11 |
| C | N | 4.527 | 4.5303 | 4.5309 | 4.5310 | -0.07 | -0.09 | -0.09 |
| D | N | 4.412 | 4.4145 | 4.4142 | 4.4142 | -0.06 | -0.05 | -0.05 |
| E | N | 4.297 | 4.2976 | 4.2979 | 4.2981 | -0.01 | -0.02 | -0.03 |
| C | 16R | 4.115 | 4.1190 | 4.1190 | 4.1189 | -0.10 | -0.10 | -0.09 |
| C | 15R | 4.138 | 4.1426 | 4.1425 | 4.1425 | -0.11 | -0.11 | -0.11 |
| C | 14R | 4.163 | 4.1665 | 4.1662 | 4.1662 | -0.08 | -0.08 | -0.08 |
| C | 13R | 4.188 | 4.1904 | 4.1904 | 4.1906 | -0.06 | -0.06 | -0.06 |
| C | 12R | 4.211 | 4.2149 | 4.2148 | 4.2148 | -0.09 | -0.09 | -0.09 |
| C | 11R | 4.235 | 4.2396 | 4.2396 | 4.2397 | -0.11 | -0.11 | -0.11 |
| C | 10R | 4.261 | 4.2646 | 4.2643 | 4.2643 | -0.08 | -0.08 | -0.08 |
| C | 9R | 4.285 | 4.2899 | 4.2896 | 4.2898 | -0.11 | -0.11 | -0.11 |
| C | 8R | 4.311 | 4.3154 | 4.3154 | 4.3155 | -0.10 | -0.10 | -0.10 |
| C | 7R | 4.336 | 4.3413 | 4.3411 | 4.3410 | -0.12 | -0.12 | -0.12 |
| C | 6R | 4.363 | 4.3669 | 4.3675 | 4.3672 | -0.09 | -0.10 | -0.10 |
| C | 5R | 4.389 | 4.3939 | 4.3936 | 4.3936 | -0.11 | -0.10 | -0.10 |
| C | 4R | 4.417 | 4.4204 | 4.4204 | 4.4206 | -0.08 | -0.08 | -0.08 |

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| **RatioTest** | | | | | | | | |
| Ratio, polarity and phase rotation test per IEEE C57.12.00 requirements were performed;all ratios arewithin ±0.5% of indicated nameplate ratios. Phase rotation and polarities are correct | | | | | | | | |
| **69.0 KV/26.4Y KV** | | | | | | | | |
|  | | | **Tested** | | | **Error From NP** | | |
| **Tap** | | **NamePlates** | **PHASE** | | | **PHASE** | | |
| **HV** | **XV** | **AØ** | **BØ** | **CØ** | **AØ** | **BØ** | **CØ** |
| C | 3R | 4.444 | 4.4475 | 4.4474 | 4.4477 | -0.08 | -0.08 | -0.08 |
| C | 2R | 4.471 | 4.4744 | 4.4753 | 4.4756 | -0.08 | -0.10 | -0.10 |
| C | 1R | 4.498 | 4.5023 | 4.5028 | 4.5031 | -0.10 | -0.11 | -0.11 |
| C | 1L | 4.555 | 4.5594 | 4.5591 | 4.5598 | -0.10 | -0.09 | -0.11 |
| C | 2L | 4.584 | 4.5876 | 4.5883 | 4.5884 | -0.08 | -0.09 | -0.10 |
| C | 3L | 4.613 | 4.6168 | 4.6171 | 4.6176 | -0.08 | -0.09 | -0.10 |
| C | 4L | 4.643 | 4.6465 | 4.6466 | 4.6473 | -0.08 | -0.08 | -0.09 |
| C | 5L | 4.672 | 4.6772 | 4.6776 | 4.6773 | -0.11 | -0.12 | -0.11 |
| C | 6L | 4.703 | 4.7079 | 4.7081 | 4.7081 | -0.10 | -0.11 | -0.11 |
| C | 7L | 4.733 | 4.7386 | 4.7386 | 4.7388 | -0.12 | -0.12 | -0.12 |
| C | 8L | 4.765 | 4.7701 | 4.7697 | 4.7700 | -0.11 | -0.10 | -0.10 |
| C | 9L | 4.796 | 4.8015 | 4.8017 | 4.8016 | -0.11 | -0.12 | -0.12 |
| C | 10L | 4.829 | 4.8336 | 4.8337 | 4.8337 | -0.10 | -0.10 | -0.10 |
| C | 11L | 4.860 | 4.8662 | 4.8663 | 4.8661 | -0.13 | -0.13 | -0.13 |
| C | 12L | 4.894 | 4.8992 | 4.8990 | 4.8990 | -0.11 | -0.10 | -0.10 |
| C | 13L | 4.926 | 4.9327 | 4.9324 | 4.9324 | -0.14 | -0.13 | -0.13 |
| C | 14L | 4.961 | 4.9664 | 4.9662 | 4.9663 | -0.11 | -0.10 | -0.11 |
| C | 15L | 4.994 | 5.0008 | 5.0006 | 5.0004 | -0.14 | -0.13 | -0.13 |
| C | 16L | 5.030 | 5.0356 | 5.0353 | 5.0352 | -0.11 | -0.11 | -0.10 |

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| **69.0 KV/26.4Y KV** | | | | | | | | |
|  | | | **Tested** | | | **Error From NP** | | |
| **Tap** | | **NamePlates** | **PHASE** | | | **PHASE** | | |
| **HV** | **XV** | **AØ** | **BØ** | **CØ** | **AØ** | **BØ** | **CØ** |
| A | 9R | 4.502 | 4.5082 | 4.5097 | 4.5096 | -0.14 | -0.17 | -0.17 |
| A | 8R | 4.530 | 4.5348 | 4.5362 | 4.5363 | -0.11 | -0.14 | -0.14 |
| A | 8L | 5.007 | 5.0130 | 5.0148 | 5.0147 | -0.12 | -0.16 | -0.15 |
| A | 9L | 5.039 | 5.0459 | 5.0478 | 5.0479 | -0.14 | -0.17 | -0.18 |
| B | 9R | 4.394 | 4.3975 | 4.3998 | 4.3998 | -0.08 | -0.13 | -0.13 |

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| **RatioTest** | | | | | | | | |
| Ratio, polarity and phase rotation test per IEEE C57.12.00 requirements were performed;all ratios arewithin ±0.5% of indicated nameplate ratios. Phase rotation and polarities are correct | | | | | | | | |
| **69.0 KV/26.4Y KV** | | | | | | | | |
|  | | | **Tested** | | | **Error From NP** | | |
| **Tap** | | **NamePlates** | **PHASE** | | | **PHASE** | | |
| **HV** | **XV** | **AØ** | **BØ** | **CØ** | **AØ** | **BØ** | **CØ** |
| B | 8R | 4.421 | 4.4240 | 4.4256 | 4.4254 | -0.07 | -0.10 | -0.10 |
| B | 8L | 4.886 | 4.8897 | 4.8916 | 4.8916 | -0.08 | -0.11 | -0.11 |
| B | 9L | 4.917 | 4.9228 | 4.9245 | 4.9246 | -0.12 | -0.15 | -0.15 |
| D | 9R | 4.176 | 4.1791 | 4.1790 | 4.1788 | -0.07 | -0.07 | -0.07 |
| D | 8R | 4.202 | 4.2038 | 4.2043 | 4.2047 | -0.04 | -0.05 | -0.06 |
| D | 8L | 4.644 | 4.6469 | 4.6471 | 4.6473 | -0.06 | -0.07 | -0.07 |
| D | 9L | 4.674 | 4.6777 | 4.6778 | 4.6778 | -0.08 | -0.08 | -0.08 |
| E | 9R | 4.068 | 4.0688 | 4.0690 | 4.0687 | -0.02 | -0.02 | -0.02 |
| E | 8R | 4.093 | 4.0931 | 4.0928 | 4.0933 | -0.00 | 0.00 | -0.01 |
| E | 8L | 4.523 | 4.5248 | 4.5248 | 4.5245 | -0.04 | -0.04 | -0.03 |
| E | 9L | 4.553 | 4.5549 | 4.5546 | 4.5548 | -0.04 | -0.04 | -0.04 |

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| **69.0 KV/13.2Y KV** | | | | | | | | |
|  | | | **Tested** | | | **Error From NP** | | |
| **Tap** | | **NamePlates** | **PHASE** | | | **PHASE** | | |
| **HV** | **XV** | **AØ** | **BØ** | **CØ** | **AØ** | **BØ** | **CØ** |
| A | N | 9.513 | 9.5233 | 9.5243 | 9.5249 | -0.11 | -0.12 | -0.13 |
| B | N | 9.284 | 9.2901 | 9.2919 | 9.2953 | -0.07 | -0.09 | -0.12 |
| C | N | 9.054 | 9.0594 | 9.0605 | 9.0594 | -0.06 | -0.07 | -0.06 |
| D | N | 8.824 | 8.8293 | 8.8279 | 8.8275 | -0.06 | -0.04 | -0.04 |
| E | N | 8.595 | 8.5963 | 8.5963 | 8.5973 | -0.02 | -0.02 | -0.03 |
| C | 16R | 8.231 | 8.2403 | 8.2376 | 8.2405 | -0.11 | -0.08 | -0.12 |
| C | 15R | 8.276 | 8.2876 | 8.2872 | 8.2873 | -0.14 | -0.14 | -0.14 |
| C | 14R | 8.323 | 8.3348 | 8.3345 | 8.3348 | -0.14 | -0.14 | -0.14 |
| C | 13R | 8.375 | 8.3829 | 8.3816 | 8.3829 | -0.09 | -0.08 | -0.09 |
| C | 12R | 8.422 | 8.4315 | 8.4305 | 8.4315 | -0.11 | -0.10 | -0.11 |
| C | 11R | 8.470 | 8.4808 | 8.4808 | 8.4808 | -0.13 | -0.13 | -0.13 |
| C | 10R | 8.518 | 8.5306 | 8.5306 | 8.5306 | -0.15 | -0.15 | -0.15 |
| C | 9R | 8.573 | 8.5810 | 8.5784 | 8.5810 | -0.09 | -0.06 | -0.09 |

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| **RatioTest** | | | | | | | | |
| Ratio, polarity and phase rotation test per IEEE C57.12.00 requirements were performed;all ratios arewithin ±0.5% of indicated nameplate ratios. Phase rotation and polarities are correct | | | | | | | | |
| **69.0 KV/13.2Y KV** | | | | | | | | |
|  | | | **Tested** | | | **Error From NP** | | |
| **Tap** | | **NamePlates** | **PHASE** | | | **PHASE** | | |
| **HV** | **XV** | **AØ** | **BØ** | **CØ** | **AØ** | **BØ** | **CØ** |
| C | 8R | 8.623 | 8.6289 | 8.6295 | 8.6289 | -0.07 | -0.08 | -0.07 |
| C | 7R | 8.673 | 8.6814 | 8.6805 | 8.6818 | -0.10 | -0.09 | -0.10 |
| C | 6R | 8.723 | 8.7342 | 8.7327 | 8.7344 | -0.13 | -0.11 | -0.13 |
| C | 5R | 8.781 | 8.7865 | 8.7855 | 8.7857 | -0.06 | -0.05 | -0.05 |
| C | 4R | 8.833 | 8.8407 | 8.8389 | 8.8411 | -0.09 | -0.07 | -0.09 |
| C | 3R | 8.886 | 8.8945 | 8.8931 | 8.8949 | -0.10 | -0.08 | -0.10 |
| C | 2R | 8.939 | 8.9490 | 8.9478 | 8.9507 | -0.11 | -0.10 | -0.13 |
| C | 1R | 8.999 | 9.0033 | 9.0045 | 9.0047 | -0.05 | -0.06 | -0.06 |
| C | 1L | 9.109 | 9.1173 | 9.1183 | 9.1183 | -0.09 | -0.10 | -0.10 |
| C | 2L | 9.165 | 9.1773 | 9.1767 | 9.1771 | -0.13 | -0.13 | -0.13 |
| C | 3L | 9.229 | 9.2352 | 9.2353 | 9.2353 | -0.07 | -0.07 | -0.07 |
| C | 4L | 9.286 | 9.2947 | 9.2944 | 9.2945 | -0.09 | -0.09 | -0.09 |
| C | 5L | 9.344 | 9.3544 | 9.3543 | 9.3559 | -0.11 | -0.11 | -0.13 |
| C | 6L | 9.403 | 9.4160 | 9.4148 | 9.4171 | -0.14 | -0.13 | -0.15 |
| C | 7L | 9.470 | 9.4786 | 9.4762 | 9.4799 | -0.09 | -0.07 | -0.10 |
| C | 8L | 9.530 | 9.5410 | 9.5421 | 9.5422 | -0.12 | -0.13 | -0.13 |
| C | 9L | 9.592 | 9.5989 | 9.6005 | 9.6006 | -0.07 | -0.09 | -0.09 |
| C | 10L | 9.654 | 9.6660 | 9.6646 | 9.6661 | -0.12 | -0.11 | -0.13 |
| C | 11L | 9.724 | 9.7306 | 9.7316 | 9.7315 | -0.07 | -0.08 | -0.08 |
| C | 12L | 9.788 | 9.7972 | 9.7967 | 9.7979 | -0.09 | -0.09 | -0.10 |
| C | 13L | 9.853 | 9.8639 | 9.8637 | 9.8645 | -0.11 | -0.11 | -0.12 |
| C | 14L | 9.918 | 9.9320 | 9.9323 | 9.9326 | -0.14 | -0.14 | -0.15 |
| C | 15L | 9.993 | 10.001 | 10.001 | 10.001 | -0.08 | -0.08 | -0.08 |
| C | 16L | 10.060 | 10.070 | 10.071 | 10.071 | -0.10 | -0.11 | -0.11 |

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| **RatioTest** | | | | | | | | |
| Ratio, polarity and phase rotation test per IEEE C57.12.00 requirements were performed;all ratios arewithin ±0.5% of indicated nameplate ratios. Phase rotation and polarities are correct | | | | | | | | |
| **69.0 KV/13.2Y KV** | | | | | | | | |
|  | | | **Tested** | | | **Error From NP** | | |
| **Tap** | | **NamePlates** | **PHASE** | | | **PHASE** | | |
| **HV** | **XV** | **AØ** | **BØ** | **CØ** | **AØ** | **BØ** | **CØ** |
| A | 9R | 9.008 | 9.0164 | 9.0197 | 9.0197 | -0.09 | -0.13 | -0.13 |
| A | 8R | 9.060 | 9.0696 | 9.0727 | 9.0732 | -0.11 | -0.14 | -0.15 |
| A | 8L | 10.014 | 10.028 | 10.030 | 10.030 | -0.14 | -0.16 | -0.16 |
| A | 9L | 10.078 | 10.091 | 10.096 | 10.096 | -0.13 | -0.18 | -0.18 |
| B | 9R | 8.791 | 8.7978 | 8.8011 | 8.8011 | -0.08 | -0.11 | -0.11 |
| B | 8R | 8.841 | 8.8484 | 8.8516 | 8.8516 | -0.08 | -0.12 | -0.12 |
| B | 8L | 9.772 | 9.7825 | 9.7840 | 9.7862 | -0.11 | -0.12 | -0.15 |
| B | 9L | 9.835 | 9.8451 | 9.8490 | 9.8480 | -0.10 | -0.14 | -0.13 |
| D | 9R | 8.356 | 8.3602 | 8.3598 | 8.3602 | -0.05 | -0.05 | -0.05 |
| D | 8R | 8.404 | 8.4086 | 8.4086 | 8.4086 | -0.05 | -0.05 | -0.05 |
| D | 8L | 9.289 | 9.2947 | 9.2954 | 9.2959 | -0.06 | -0.07 | -0.07 |
| D | 9L | 9.348 | 9.3577 | 9.3577 | 9.3578 | -0.10 | -0.10 | -0.10 |
| E | 9R | 8.138 | 8.1397 | 8.1396 | 8.1398 | -0.02 | -0.02 | -0.02 |
| E | 8R | 8.185 | 8.1883 | 8.1882 | 8.1883 | -0.04 | -0.04 | -0.04 |
| E | 8L | 9.047 | 9.0525 | 9.0525 | 9.0499 | -0.06 | -0.06 | -0.03 |
| E | 9L | 9.105 | 9.1124 | 9.1118 | 9.1093 | -0.08 | -0.07 | -0.05 |

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| **CAPACITANCE AND % POWER FACTOR** | | | | | |
| **Test** | **Connection** | **Measurement** | **Cap(PF)** | **Power Factor(%)** | |
| **Corrected @20°C** | **Tested @27°C** |
| 1 | HV‐(XV + GRND) | CHX + CH | 6314 | 0.18 | 0.19 |
| 2 | HV‐GRND, XV @ GUARD | CH | 2872 | 0.22 | 0.23 |
| 3 | HV‐GRND, XV @ UST | CHX | 3442 | 0.15 | 0.15 |
| 4 | Calculated: #1 - #2 | CHX | 3442 | 0.14 | 0.14 |
| 5 | XV‐(HV + GRND) | CHX + CX | 14207 | 0.19 | 0.20 |
| 6 | XV‐GRND, HV @ GUARD | CX | 10765 | 0.20 | 0.21 |
| 7 | XV‐GRND, HV @ UST | CHX | 3442 | 0.15 | 0.15 |
| 8 | Calculated: #5 - #6 | CHX | 3442 | 0.14 | 0.14 |

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| **CAPACITANCE AND % POWER FACTOR** | | | | | |
| **Test** | **Connection** | **Measurement** | **Cap(PF)** | **Power Factor(%)** | |
| **Corrected @20°C** | **Tested @26°C** |
| 1 | HV‐(XV + GRND) | CHX + CH | 6312 | 0.19 | 0.20 |
| 2 | HV‐GRND, XV @ GUARD | CH | 2872 | 0.23 | 0.24 |
| 3 | HV‐GRND, XV @ UST | CHX | 3440 | 0.16 | 0.16 |
| 4 | Calculated: #1 - #2 | CHX | 3440 | 0.16 | 0.16 |
| 5 | XV‐(HV + GRND) | CHX + CX | 14206 | 0.20 | 0.21 |
| 6 | XV‐GRND, HV @ GUARD | CX | 10765 | 0.21 | 0.22 |
| 7 | XV‐GRND, HV @ UST | CHX | 3440 | 0.16 | 0.16 |
| 8 | Calculated: #5 - #6 | CHX | 3441 | 0.15 | 0.15 |

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| **1ø Excitation Test** | | | | | |
| **Energize** | **Ground** | **Float** | **Return** | **Measurement** | **Ø`s** |
| H1 | Tank;H2;X0 | X1;X2;X3 | H3 | H1-H3 | A |
| H2 | Tank;H3;X0 | X1;X2;X3 | H1 | H2-H1 | B |
| H3 | Tank;H1;X0 | X1;X2;X3 | H2 | H3-H1 | C |

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| **69.0 KV/13.2Y KV** | | | | |
| **69.0 KV/13.2Y KV** | | **Tap Positions** | | |
| **14.86** | **6.73** | **14.98** | **C** | **16R** |
| C | N | 14.86 | 6.73 | 14.98 |
| C | 16R | 17.73 | 7.76 | 17.02 |

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| **138.0 KV/26.4Y KV** | | | | |
| **138.0 KV/26.4Y KV** | | **Tap Positions** | | |
| **4.58** | **2.28** | **4.83** | **C** | **16R** |
| C | N | 4.58 | 2.28 | 4.83 |
| C | 16R | 5.52 | 2.61 | 5.22 |

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| **BUSHING INFORMATION** | | | | | | | |
| **Name** | **Vendor** | **Serial No.** | **BIL** | **Nameplate C1** | | **Nameplate C2** | |
| **Cap.(pF)** | **PF(%)** | **Cap.(pF)** | **PF(%)** |
| h1 | P-Core | 19-202369 | 650 | 429 | 0.30 | 3657 | 0.24 |
| h2 | P-Core | 19-202373 | 650 | 431 | 0.30 | 3676 | 0.25 |
| h3 | P-Core | 19-202615 | 650 | 434 | 0.33 | 3770 | 0.26 |
| x1 | P-Core | 18-197884 | 200 | 421 | 0.22 | - | - |
| x2 | P-Core | 19-201777 | 200 | 421 | 0.27 | - | - |
| x3 | P-Core | 18-193745 | 200 | 425 | 0.24 | - | - |
| x0 | P-Core | 18-197889 | 200 | 421 | 0.23 | - | - |

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