

TRANSFORMER DATA SHEET

DATE : 03/08/2024  
 CUSTOMER : HVES  
 CIRCUIT/LOCATION : HVES 98  
 MANUFACTURER : HC Transformer  
 TRANSFORMER TYPE : Pad Mount CLASS : ONAN  
 S/N : OP1000-2339

THREE PHASE  SINGLE PHASE  : 60 HERTZ

VOLTAGE RATING: 13800X4800 Delta-480Y/277

KVA RATING: 1000 Continuous, Self Cooled  
 Continuous, Forced Air

LV WINDING: ALUMINUM

HV WINDING: ALUMINUM

LV: 65°C rise, BIL: 30kV

HV: 65°C rise, BIL: 95kV

NAMEPLATE DATA

Core & Coils	
Case & Fittings	
Oil in Gallons	440
Weight in Pounds	11795

Fluid Type : Mineral Oil

Impedance volts : 5.75 % at rated volts at : 1000 KVA

MEGGER TEST RESULTS

**TRANSFORMER TEST DATA**

1 Minute

POLARIZATION INDEX

CAPACITANCE

High-> Ground		M-Ohms, @	5	kV DC			micro-farad
Low -> Ground		M-Ohms, @	1	kV DC			micro-farad
High-> Low		M-Ohms, @	1	kV DC			micro-farad

TRANSFORMER TTR TESTS

TAP (V)	CALC. TTR	PHASE 1	PHASE 2	PHASE 3
14400	51.962			
13800	49.796			
13200	47.582			
12470	45.007			
12000	43.284			
4800	17.321			

COMMENTS

Tag 11524  
 Date of Manufacture 11/2023  
 See factory test report for TTR results.

# TEST REPORT

## Padmount Transformer

3 Phase 1000kVA 13800x4800D - 480y V

P.O. No. : DS21-246

Nov. 2023

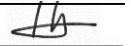


Tested by : Kang, Min-Jae



date : 2023-11-01

Checked by : Ha, Jae-gyeong



date : 2023-11-01

Approved by : Kim, Seung-Hwan



date : 2023-11-01

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**1. Rating**

1. Phase	:	3 Ø	2. Capacity	:	1,000 kVA
3. Rated frequency	:	60 Hz	4. Vector Group	:	Dyn1
5. Cooling method	:	ONAN	6. Core type	:	Wound
7. Rated voltage	( High voltage / Low voltage )	:	13800 x 4800 / 480	V	
8. Rated current	( High voltage / Low voltage )	:	41.8 x 120.3 / 1202.8	A	
9. Insulation level	( High voltage / Low voltage )	:	95 / 30	kV(BIL)	
10. Oil volume	:	440 GAL	11. Total weight	:	11795 lbs
12. Serial No.	:	OP1000-2339			
13. Date of manufacture	:	Nov. 2023			
14. Standard	:	IEEE C57.12.00			

**2. Measurement of voltage ratio**

DUAL Switch POS. 2

Tolerance : ± 0.5%

Tap Voltage				Rated ratio	Measured value						Results
HV		LV			H1 phase		H2 phase		H3 phase		
No.	Voltage	No.	Voltage		Ratio	Error(%)	Ratio	Error(%)	Ratio	Error(%)	
A	14400	-	480	51.962	51.869	-0.18	51.861	-0.19	51.873	-0.17	<i>Good</i>
B	13800	-	480	49.796	49.721	-0.15	49.720	-0.15	49.727	-0.14	
C	13200	-	480	47.631	47.582	-0.10	47.577	-0.11	47.576	-0.12	
D	12470	-	480	44.997	45.007	0.02	45.005	0.02	45.014	0.04	
E	12000	-	480	43.301	43.284	-0.04	43.295	-0.01	43.301	0.00	

DUAL Switch POS. 1

Tap Voltage				Rated ratio	Measured value						Results
HV		LV			H1 phase		H2 phase		H3 phase		
No.	Voltage	No.	Voltage		Ratio	Error(%)	Ratio	Error(%)	Ratio	Error(%)	
A	4800	-	480	17.321	17.290	-0.18	17.292	-0.16	17.295	-0.15	<i>Good</i>

**3. Check of phase relationship**

Dyn1

*Good*

**4. Measurement of winding resistance**

DUAL Switch POS. 2

Ambient temperature : 23 °C

Tap No.	Tap Voltage	Measured value( $\Omega$ )					
		H1-H2		H2-H3		H3-H1	
		at 23°C	at 55°C	at 23°C	at 55°C	at 23°C	at 55°C
A	14400	0.807300	0.911468	0.807800	0.912032	0.805050	0.908927
B	13800	0.774900	0.874887	0.775400	0.875452	0.772800	0.872516
C	13200	0.740650	0.836218	0.741200	0.836839	0.738750	0.834073
D	12470	0.703100	0.793823	0.703700	0.794500	0.701250	0.791734
E	12000	0.674950	0.762040	0.675700	0.762887	0.673250	0.760121

DUAL Switch POS. 1

Ambient temperature : 23 °C

Tap No.	Tap Voltage	Measured value( $\Omega$ )					
		H1-H2		H2-H3		H3-H1	
		at 23°C	at 55°C	at 23°C	at 55°C	at 23°C	at 55°C
A	4800	0.090100	0.101726	0.090220	0.101861	0.089990	0.101602

Tap No.	Tap Voltage	Measured value( $\Omega$ )					
		x1-x2		x2-x3		x3-x1	
		at 23°C	at 55°C	at 23°C	at 55°C	at 23°C	at 55°C
-	480	0.00065565	0.00074025	0.00065230	0.00073647	0.00066195	0.00074736

**5. Insulation Resistance Measurement**

- 1) Winding insulation resistance measurement - 2500V, 1000G
- $\Omega$
- Meter.

HV Winding to LV Winding : 20500 M $\Omega$ HV Winding to Earth : 21700 M $\Omega$ LV Winding to Earth : 23400 M $\Omega$ 

- 2) Core & Clamp insulation resistance measurement - 1000V, 1G
- $\Omega$
- Meter.

Core- Earth : >1000 M $\Omega$ Clamp- Earth : >1000 M $\Omega$ Core- Clamp : >1000 M $\Omega$ **6. Measurement of no-load loss and current**

Test frequency 60 Hz, Ambient temperature : 23 °C

LV side connection at rated voltage 480 V, Tap No: B

Items	Guaranteed value	Measurement value	Results
No-load loss (W)	-	1352	Good
No-load current (%)	-	0.25	

**7. Load losses and impedance voltage**

Reference temperature : 55 °C at. 13800-480V

Items	Tap No.	Voltage	Guaranteed	Measurement	Results
Load loss (W)	A	14,400	-	4999	<i>Good</i>
	B	13,800	-	5124	
	E	12,000	-	5819	

Reference temperature : 85 °C

Items	Tap No.	Voltage	Guaranteed	Measurement	Results
% Impedance (%)	A	14,400	-	5.76	<i>Good</i>
	B	13,800	5.75±7.5%	5.81	
	E	12,000	-	6.12	

Reference temperature : 55 °C at. 4800-480V

Items	Tap No.	Voltage	Guaranteed	Measurement	Results
Load loss (W)	A	4,800	-	4994	<i>Good</i>

Reference temperature : 85 °C

Items	Tap No.	Voltage	Guaranteed	Measurement	Results
% Impedance (%)	A	4,800	-	5.71	<i>Good</i>

**8. Efficiency & Voltage regulation**

Reference temperature : 55 °C at. 13800-480V

Items	Guaranteed value	Measurement value	Results
Efficiency (at 100% load)	-	99.36 %	<i>Good</i>
Efficiency (at 50% load)	99.43 %	99.48 %	
Voltage regulation at power factor 1.0	-	0.71 %	

Reference temperature : 55 °C at. 4800-480V

Items	Guaranteed value	Measurement value	Results
Efficiency (at 100% load)	-	99.37 %	<i>Good</i>
Efficiency (at 50% load)	-	99.48 %	
Voltage regulation at power factor 1.0	-	0.69 %	

**9. Temperature rise test**

(Type test)

Items	Guaranteed value	Measurement value	Results
Insulation oil	65 °C	57.9 °C	<i>Good</i>
H.V. windings	65 °C	59.6 °C	
L.V. windings	65 °C	58.8 °C	

**10. Applied voltage test**

Items	Test voltage(kV)	Duration(sec.)	Results
HV side	34	60	<i>Withstood</i>
LV side	10	60	

**11. Induced voltage test**

Supply	Test voltage(kV)	Duration(sec.)	Frequency(Hz)	Results
LV	0.96	40	180	<i>Withstood</i>

**12. Lightning impulse test**

	Test voltage(kV)	Test sequence	Results
HV Line	95	FW-FW	<i>Withstood</i>
HV Neutral	-	-	
LV Line	-	-	
LV Neutral	-	-	

**13. Insulation power factor test**

Reference temperature : 20 °C

Items	Test voltage (kV)	Measurement value	Results
H-G	10	0.44	<i>Good</i>
H-L	10	0.20	
L-G	3	0.59	

**14. Oil leakage test**

Test result : Passed

One transformer tank with other fittings and radiator were over pressured to normal pressure plus 0.50 kgf/cm<sup>2</sup> for 12 hours.

After this test, the completed transformer with accessories proved no leaks.



UNIT 98

SW 121  
NOT TO BE USED  
FOR ANY OTHER  
PURPOSES THAN  
THOSE SPECIFIED  
HEREON  
FOR THE USE OF  
THE USER  
FOR THE USE OF  
THE USER  
FOR THE USE OF  
THE USER

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