

TRANSFORMER DATA SHEET

DATE : 03/08/2024  
 CUSTOMER : HVES  
 CIRCUIT/LOCATION : HVES 99  
 MANUFACTURER : HC Transformer  
 TRANSFORMER TYPE : Pad Mount CLASS : ONAN  
 S/N : OP1000-2340

THREE PHASE  SINGLE PHASE  : 60 HERTZ

VOLTAGE RATING: 13800X4160 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

Weight in Pounds

440
11800

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
1
1

kV DC



micro-farad

Low -> Ground

M-Ohms, @

kV DC

micro-farad

High-> Low

M-Ohms, @

kV DC

micro-farad

TRANSFORMER TTR TESTS

TAP (V)	CALC. TTR	PHASE 1	PHASE 2	PHASE 3
14400	51.962			
13800	49.796			
13200	47.631			
12470	44.997			
12000	43.301			
4160	15.011			

COMMENTS

Tag 11525  
 Date of Manufacture 11/2023  
 See factory test report for TTR results.

# TEST REPORT

## Padmount Transformer

3 Phase 1000kVA 13800x4160D - 480y V

P.O. No. : DS21-246

Nov. 2023

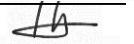


Tested by : Kang, Min-Jae




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 4160 / 480	V	
8. Rated current	( High voltage / Low voltage )	:	41.8 x 138.8 / 1202.8	A	
9. Insulation level	( High voltage / Low voltage )	:	95 / 30	kV(BIL)	
10. Oil volume	:	440 GAL	11. Total weight	:	11800 lbs
12. Serial No.	:	OP1000-2340			
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	51.877	-0.16	51.871	-0.17	51.874	-0.17	<i>Good</i>
B	13800	-	480	49.796	49.732	-0.13	49.735	-0.12	49.743	-0.11	
C	13200	-	480	47.631	47.578	-0.11	47.591	-0.08	47.592	-0.08	
D	12470	-	480	44.997	45.027	0.07	45.014	0.04	45.014	0.04	
E	12000	-	480	43.301	43.303	0.00	43.304	0.01	43.299	-0.01	

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(%)	
D	4160	-	480	15.011	15.011	0.00	15.006	-0.03	15.006	-0.03	<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	0.804850	0.908702	0.804150	0.907911	0.803900	0.907629
B	13800	0.772600	0.872290	0.771750	0.871331	0.771700	0.871274
C	13200	0.738800	0.834129	0.738050	0.833282	0.737950	0.833169
D	12470	0.701350	0.791847	0.700700	0.791113	0.700600	0.791000
E	12000	0.673700	0.760629	0.672950	0.759782	0.672800	0.759613

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
D	4160	0.078380	0.088494	0.078360	0.088471	0.078465	0.088590

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	0.00064830	0.00073195	0.00064305	0.00072602	0.00065375	0.00073810

**5. Insulation Resistance Measurement**

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

HV Winding to LV Winding	:	19200 M $\Omega$
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HV Winding to Earth	:	23500 M $\Omega$
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LV Winding to Earth	:	26000 M $\Omega$
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- 2) Core & Clamp insulation resistance measurement - 1000V, 1G $\Omega$  Meter.

Core- Earth	:	>1000 M $\Omega$
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Clamp- Earth	:	>1000 M $\Omega$
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Core- Clamp	:	>1000 M $\Omega$
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**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)	-	1358	Good
No-load current (%)	-	0.27	

**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	-	5100	<i>Good</i>
	B	13,800	-	5164	
	E	12,000	-	5428	

Reference temperature : 85 °C

Items	Tap No.	Voltage	Guaranteed	Measurement	Results
% Impedance (%)	A	14,400	-	5.83	<i>Good</i>
	B	13,800	5.75±7.5%	5.81	
	E	12,000	-	5.76	

Reference temperature : 55 °C at. 4160-480V

Items	Tap No.	Voltage	Guaranteed	Measurement	Results
Load loss (W)	D	4,160	-	5358	<i>Good</i>

Reference temperature : 85 °C

Items	Tap No.	Voltage	Guaranteed	Measurement	Results
% Impedance (%)	D	4,160	-	5.77	<i>Good</i>

**8. Efficiency & Voltage regulation**

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

Items	Guaranteed value	Measurement value	Results
Efficiency (at 100% load)	-	99.35 %	<i>Good</i>
Efficiency (at 50% load)	99.43 %	99.47 %	
Voltage regulation at power factor 1.0	-	0.71 %	

Reference temperature : 55 °C at. 4160-480V

Items	Guaranteed value	Measurement value	Results
Efficiency (at 100% load)	-	99.33 %	<i>Good</i>
Efficiency (at 50% load)	-	99.46 %	
Voltage regulation at power factor 1.0	-	0.73 %	

**9. Temperature rise test**

(Type test)

Items	Guaranteed value	Measurement value	Results
Insulation oil	65 °C	59.7 °C	<i>Good</i>
H.V. windings	65 °C	59.8 °C	
L.V. windings	65 °C	57.7 °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	0.34	<i>Good</i>
H-L	10	0.29	
L-G	3	0.44	

**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 99





**UNIT 99**

UNIT 99  
DATE: 10/10/14  
BY: [illegible]  
[illegible]  
[illegible]  
[illegible]  
[illegible]

