



**DISTRIBUTION COMMISSIONING TEST SHEET – SINGLE PHASE PAD/POLE MOUNTED TRANSFORMER
HPC-4DL-07-0029-2014**

This commissioning test sheet covers the checking, testing and commissioning of all replacement or new installations of single-phase pad/pole-mounted transformers up to 50 kVA before energisation.



NOTE: Tests must be carried out after the installation, alteration or repair and before putting back to service.
SAFETY: At all times maintain suitable clearance to all other electrical equipment and verify planned escape routes.
 In preparation for the tests, wherever possible, disconnect the cables from the equipment on both sides and make the area safe.

DATE:		Project No.		Name of Officer	
Transformer Location:					

1. TRANSFORMER DESCRIPTION

	kV	V	Rated kVA	kVA	Stock code		Serial Number	
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2. VISUAL INSPECTION AND SAFETY CHECK

Inspect the following: <ul style="list-style-type: none"> • Rating plate • Tank and bushings • Tap setting • HV terminations • LV terminations • Neutral connection • MEN/N-E connections 	1	Check that the installation complies with the distribution construction standards and applicable design drawings.	<input type="checkbox"/>		
	2	Check that Public Safety has been considered (e.g. cabinets secured and locked, anti-climbing devices applied, trip hazards removed where applicable).	<input type="checkbox"/>		
	3	Check the supply to the transformer, that it is switched off and isolated.	<input type="checkbox"/>		
	4	Confirm (with approved testing device) that the transformer is de-energised.	<input type="checkbox"/>		
	5	Ensure that the earth system is complete, undamaged and bonded to earth points.	<input type="checkbox"/>		
	6	Check that the nearest conductive material is at least two (2) metres away from the earth ring/system (take a photo if possible)	Measured distance	m	<input type="checkbox"/>
	7	Transformer voltage rating matches system voltage.	<input type="checkbox"/>		
	8	Transformer tap is at the position of previously installed transformer or per network planning requirements.	<input type="checkbox"/>		
	9	Transformer tank and bushings in good condition (no oil leaks).	<input type="checkbox"/>		
	10	HV cables are properly terminated and connected on transformer bushings (if applicable).	<input type="checkbox"/>		



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	11	The dead-end plugs are the correct voltage rating and correctly installed (transformer with 2 sets of HV bushings).	<input type="checkbox"/>
	12	LV cables are properly terminated and connected on transformer LV bushings (if applicable).	<input type="checkbox"/>
	13	Check neutral connected to neutral bar, earth connected to earth bar, check MEN link present.	<input type="checkbox"/>
	14	All labels fitted and numbered correctly.	<input type="checkbox"/>
	15	LV lead connections to the transformer LV bushing are correct as per construction standards (for new connection).	<input type="checkbox"/>

3. EARTH RESISTANCE TEST (PAD)

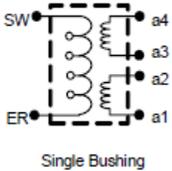
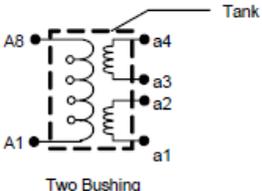
1	Test earth resistance using one of the following DCT's and record value in 3.4.	<input type="checkbox"/>							
2	New earth stakes, use HPC-4DL-07-0004-2014 DCT- Earth Testing of Distribution Substation, to test the earths.	<input type="checkbox"/>							
3	Existing earth stakes, use HPC-4DL-07-0037-2017 DCT- Earth Testing of Altered Systems, to test the earths.	<input type="checkbox"/>							
4	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">Previous test value if known</td> <td style="width: 10%;">= _____ Ω</td> <td style="width: 25%;">Measured value</td> <td style="width: 10%;">= _____ Ω</td> <td style="width: 15%;">Value acceptable</td> <td style="width: 15%;">Yes <input type="checkbox"/></td> <td style="width: 10%;">No <input type="checkbox"/></td> </tr> </table>	Previous test value if known	= _____ Ω	Measured value	= _____ Ω	Value acceptable	Yes <input type="checkbox"/>	No <input type="checkbox"/>	<input type="checkbox"/>
	Previous test value if known	= _____ Ω	Measured value	= _____ Ω	Value acceptable	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
Measured value would be acceptable if below 10 Ohms or a value between 0.8 and 1.2 which is obtained when dividing the Measured value by the Previous test value. Note: If previous test value is not known a value less than or equal to, 10 Ohms is acceptable.									
5	Earth stake resistance above 10 Ohms or outside of an acceptable value must be communicated to the formal leader or Asset manager.	<input type="checkbox"/>							

4. EARTH RESISTANCE TEST (POLE)

1	Test earth resistance using one of the following DCT's and record value in 3.4.	<input type="checkbox"/>							
2	New earth stake, use HPC-4DL-07-0038-2017 DCT- Earth Testing of Distribution Poles, to test the earth.	<input type="checkbox"/>							
3	Existing earth stake, use HPC-4DL-07-0037-2017 DCT- Earth Testing of Altered Systems, to test the earth.	<input type="checkbox"/>							
4	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">Previous test value if known</td> <td style="width: 10%;">= _____ Ω</td> <td style="width: 25%;">Measured value</td> <td style="width: 10%;">= _____ Ω</td> <td style="width: 15%;">Value acceptable</td> <td style="width: 15%;">Yes <input type="checkbox"/></td> <td style="width: 10%;">No <input type="checkbox"/></td> </tr> </table>	Previous test value if known	= _____ Ω	Measured value	= _____ Ω	Value acceptable	Yes <input type="checkbox"/>	No <input type="checkbox"/>	<input type="checkbox"/>
	Previous test value if known	= _____ Ω	Measured value	= _____ Ω	Value acceptable	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
Measured value would be acceptable if below 30 Ohms or a value between 0.8 and 1.2 which is obtained when dividing the Measured value by the Previous test value. Note: If previous test value is not known a value less than or equal to, 30 Ohms is acceptable.									
5	Earth stake resistance above 30 Ohms or outside of an acceptable value must be communicated to the formal leader or Asset manager.	<input type="checkbox"/>							



5. INSULATION RESISTANCE AND CONTINUITY TESTS

1	Ensure that the high voltage (HV) and low voltage (LV) windings of the transformer are de-energised.					<input type="checkbox"/>	
2	Ensure all electrical connections have been disconnected, including MEN link .					<input type="checkbox"/>	
3		Test Connection	Test Voltage	Expected Results	Test Results		
 <p>Single Bushing</p>  <p>Two Bushing</p>	<p>4. Using an insulation resistance tester for a minimum of 1 minute for a stable reading test the following:</p> <p>Discharge after each IR test.</p>	A8 to tank (two bushings only)	2.5 kV	>1,000 MΩ	Ω		
		SW/A8 to a1	1 kV	>100 MΩ	Ω		
		SW/A8 to a3	1 kV	>100 MΩ	Ω		
		Tank to a1	1 kV	>100 MΩ	Ω		
		Tank to a3	1 kV	>100 MΩ	Ω		
		5. Continuity:	SW/A8 to ER/A1	1 kV	0 Ω	Ω	
		a1 to a2	1 kV	0 Ω	Ω		
		a3 to a4	1 kV	0 Ω	Ω		
		4	Reconnect phase cables, tighten bolts with recommended torque stated below.				
5	Reconnect neutral cables, tighten bolts with recommended torque stated below.					<input type="checkbox"/>	
6	Reconnect neutral-to-earth links, tighten bolts with recommended torque stated below.					<input type="checkbox"/>	

Suggested bolt torques:

- M10 stainless steel bolts: 38 Nm
- M12 stainless steel bolts: 66 Nm
- M14 stainless steel bolts: 106 Nm
- M16 stainless steel bolts: 162 Nm



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6. HANDOVER OF RESPONSIBILITY FOR THE COMPLETION OF SECTION 1 TO 5

I hereby certify that section 1 to 5 has been completed with satisfactory results and transfer responsibility to the commissioning officer.

Testing Officer: _____ Pay Number: _____

Signature: _____ Date: DD/MM/YY Time: HH:MM

7. ENERGISATION OF TRANSFORMER WITHOUT LOAD

NOTE Highest risk of failure of a transformer is at energisation – ensure escape plan in place and JRA reflects potential hazard.

Check that the transformer LV is not connected to the LV network Check the HV fuse rating before energizing the transformer HV	If applicable, check that the HV fuses are correct.	Fuse Rating	A	<input type="checkbox"/>
	If applicable, ensure all short-circuiting equipment has been removed from the LV network			<input type="checkbox"/>
	Energise the transformer HV as per HV switching program (check for abnormal noise)		Program No.	<input type="checkbox"/>
	Measure voltage at the secondary/LV side	Expected values: 226-254 V for 240 V connections	_____ V	

8. ENERGISATION OF TRANSFORMER WITH LOAD

If applicable, check that the LV fuses are correct	<input type="checkbox"/>
Energise the LV circuits as per LV switching program.	Program No. _____ <input type="checkbox"/>
Check and record the secondary (LV) voltage.	_____ V <input type="checkbox"/>
Disconnect the transformer from any interconnected transformer (if applicable).	<input type="checkbox"/>
Conduct a service connection test on all installations where the service connection have been disturbed.	<input type="checkbox"/>
When erecting a new or reconstructed LV apparatus, check the voltage at an existing LV point, if possible. Phase out any newly fitted LV disconnectors and check them for sound operation.	<input type="checkbox"/>



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9. OPERATIONAL HANDOVER

The commissioning officer must ensure that all checks are completed and the test results comply with the minimum standards.

I hereby certify that all sections have been completed with satisfactory results and transfer responsibility to the network operating authority. This equipment is ready to be **SAFELY** energised.

Commissioning Officer: _____ Pay Number: _____
Signature: _____ Date: DD/MM/YY Time: HH:MM

1. Ensure the work area is left tidy with no hazards to the public.
2. Hand over responsibility to the operating authority
3. Return this sheet to the project/working file as a record of commissioning and as a document required for the Handover Certificate.