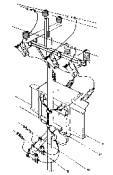


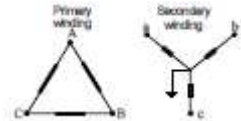


**DISTRIBUTION COMMISSIONING TEST SHEET – THREE PHASE POLE MOUNTED TRANSFORMER
HPC-4DL-07-0024-2014**

This commissioning test sheet covers the checking, testing and commissioning of all replacement or new installations of three phase pole-mounted transformers up to 315 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

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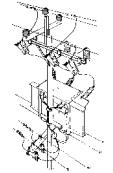
2. VISUAL INSPECTION AND SAFETY CHECK

Inspect the following: <ul style="list-style-type: none"> • Rating plate • Tank and bushings • Tap setting • Oil level • 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 (especially correct orientation as per DSM 3).	<input type="checkbox"/>	
	2	Check that Public Safety has been considered (e.g. trip hazards removed, anti-climbing devices applied where applicable).	<input type="checkbox"/>	
	3	Check the supply to the transformer, that it is switched off and isolated as per switching sheet and permit.	<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 oil level is satisfactory (if visible).	<input type="checkbox"/>	
	10	Transformer tank and bushings in good condition (no oil leaks).	<input type="checkbox"/>	
	11	Check the neutral cable is connected to the neutral bar, the earth cable to the earth bar, and check the MEN link is connected.	<input type="checkbox"/>	



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	12	All labels fitted and numbered correctly.	<input type="checkbox"/>
	13	LV lead connections to the transformer LV bushing are correct as per construction standards (for new connection).	<input type="checkbox"/>

3. INSULATION RESISTANCE TEST

1	Ensure that the earth resistance has been tested and is acceptable.	<input type="checkbox"/>
2	Ensure that the high voltage (HV) and low voltage (LV) windings of the transformer are de-energised and disconnected.	<input type="checkbox"/>
3	Ensure all electrical connections have been disconnected, including MEN/N-E connections.	<input type="checkbox"/>

	Test Connection	Test Voltage	Expected Results	Test Results
Using an insulation resistance tester for a minimum of 1 minute for a stable reading test the following: (Short circuit all winding terminals of the source of the same voltage level together.)	Primary HV to Tank	2.5 kV	>1,000 MΩ	Ω
	Primary HV to Secondary/LV	1 kV	>100 MΩ	Ω
	Secondary/LV to Tank	1 kV	>100 MΩ	Ω

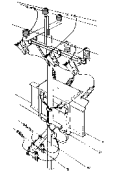
Confirm transformer has been discharged after each test.

4. CABLE RECONNECTION

1	Reconnect phase cables, tighten bolts with recommended torque stated below.	<input type="checkbox"/>
2	Reconnect neutral cables, tighten bolts with recommended torque stated below.	<input type="checkbox"/>
3	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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5. 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 HV is connected to the transformer whilst the LV remains disconnected from the LV network. Check the HV fuse rating before energising the transformer HV. Conduct a voltage and phase rotation test on the LV once the transformer is energised.	Check that the HV fuses are correct.				Fuse Rating	A	<input type="checkbox"/>
	Energise the transformer HV as per HV switching program (check for abnormal noise)				Program No.		<input type="checkbox"/>
	Conduct a voltage and phase rotation test on LV side of transformer, preferably at LV disconnect or fuse box.						<input type="checkbox"/>
	Test Connection	Allowed Range	Test Results	Test Connection	Allowed Range	Test Results	
	Red to neutral	226 – 254 V	V	Red to white	390 – 440 V	V	
	White to neutral		V	White to blue		V	
	Blue to neutral		V	Blue to red		V	
Phase rotation (123 or ABC or RWB)				Rotation			

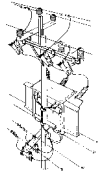
6. PHASING TEST

Conduct a phasing test at the open points of the LV network, where the LV supply is coming from another transformer.	Conduct the phasing test under switching schedules on points of the LV network where the potential of the energised transformer can be matched with the potential of another energised transformer. This test ensures that the interconnections of transformers are made or can be made for operational purposes. <ul style="list-style-type: none"> • If the LV conductors are energised from an interconnected transformer, conduct the phasing test at the new transformer's LV disconnect or fuse box. • If the LV conductors are not energised, proceed to section 6 and conduct the phasing test on normally open points where it can be interconnected from another transformer. • When erecting a new or reconstructed LV apparatus, conform to the Horizon Power practices for the construction of distribution overhead lines. Phase out at an existing LV point, if possible. Phase out any newly fitted LV disconnectors and check them for sound operation.
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7. ENERGISATION OF THE NETWORK WITH LOAD

Carry out the LV switching program and return the LV network to its original operating configuration. Connect the LV transformer to the LV network. Conduct a voltage and phase rotation test on the LV once the transformer is energised.	If applicable, ensure all short-circuiting equipment is removed from LV network.					<input type="checkbox"/>
	If applicable, check that the LV fuses are correct			Rating		<input type="checkbox"/>
	Energise the LV circuits as per LV switching program.			Program No.		<input type="checkbox"/>
	Ensure that the LV network is returned to its normal operating configuration. If applicable, ensure that the LV circuits are not interconnected with any other transformers and are supplied only from the supply transformers.					<input type="checkbox"/>
	Conduct a voltage test on the LV disconnect or fuse box of the new transformer to ascertain whether the transformer supply is within statutory limits during load conditions.					<input type="checkbox"/>
	Test Connection	Allowed Range	Test Results	Test Connection	Allowed Range	Test Results
	Red to neutral	226 – 254 V	V	Red to white	390 – 440 V	V
	White to neutral		V	White to blue		V
Blue to neutral	V		Blue to red	V		
Conduct a service connection test on all installations where the service connections have been disturbed.					<input type="checkbox"/>	

8. 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.

IMPORTANT: PLEASE ATTACH AS-BUILT DRAWINGS AND DATASHEETS TO THIS SHEET AND SEND TO RELEVANT ASSET MANAGER