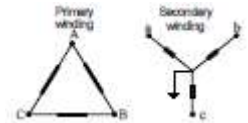
DISTRIBUTION COMMISSIONING TEST SHEET – MPS DISTRIBUTION TRANSFORMER
HPC-4DL-07-0019-2014

This commissioning test sheet covers the checking, testing and commissioning of all replacement or new installations of modular package substation (MPS) ground-mounted transformers up to 630 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	

2. VISUAL INSPECTION AND SAFETY CHECK

Inspect the following: • 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).			☐
	2	Check that Public Safety has been considered (e.g. cabinets secured and locked, trip hazards removed where applicable).			☐
	3	Check the supply to the transformer, that it is switched off and isolated as per switching sheet and permit.			☐
	4	Confirm (with approved testing device) that the transformer is de-energised.			☐
	5	Ensure that the earth system is complete, undamaged and bonded to earth points. Check 2 m clearance to conductive services or structures, and 15 m clearance to Telstra pits.			☐
	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	☐
	7	Transformer voltage rating matches system voltage.			☐
	8	Transformer tap is at the position of previously installed transformer or per network planning requirements.			☐
	9	Transformer oil level is satisfactory (if visible).			☐
	10	Transformer tank and bushings in good condition (no oil leaks).			☐
	11	HV cables are properly terminated and connected on transformer bushings.			☐

	12	The dead-end plugs are the correct voltage rating and correctly installed (transformer with 2 sets of HV bushings).	☐
	13	LV cables are properly terminated and connected on transformer LV fuseways.	☐
	14	Check neutral connected to neutral bar, earth connected to earth bar, check MEN link present	☐
	15	All labels fitted and numbered correctly.	☐

3. INSULATION RESISTANCE TEST

1	Ensure that the earth resistance has been tested and is acceptable.	☐
2	Ensure that the high voltage (HV) and low voltage (LV) windings of the transformer are de-energised.	☐
3	Ensure all electrical connections have been disconnected, **including MEN links.**	☐

	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
Using an insulation resistance tester for a minimum of 1 minute for a stable reading test the low voltage (LV) board busbar: (LV fuse ways open, including the transformer LV disconnector.)	Red phase to white phase	1 kV	>100 MΩ	Ω
	White phase to blue phase	1 kV	>100 MΩ	Ω
	Blue phase to red phase	1 kV	>100 MΩ	Ω
	Red phase to earth	1 kV	>100 MΩ	Ω
	White phase to earth	1 kV	>100 MΩ	Ω
	Blue phase to earth	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.	☐
2	Reconnect neutral cables, tighten bolts with recommended torque stated below.	☐
3	Reconnect neutral-to-earth links, tighten bolts with recommended torque stated below.	☐

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

5. ENERGISATION OF TRANSFORMER WITHOUT LOAD

Check that the transformer LV is not connected to 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	☐
Energise the transformer HV as per HV switching program (check for abnormal noise)			Program No.		☐
Test Connection	Minimum Values	Test Results	Test Connection	Minimum Values	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 voltage and phase rotation test on LV side of transformer, preferably at LV disconnect.					☐
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. • If the LV conductors are energised from an interconnected transformer, conduct the phasing test at the new transformer's LV disconnector 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.

7. ENERGISATION OF 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.					☐
	If applicable, check that the LV fuses are correct		Rating			☐
	Energise the LV circuits as per LV switching program.		Program No.			☐
	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.					☐
	Conduct a voltage test on the LV disconnector of the new transformer to ascertain whether the transformer supply is within statutory limits during load conditions.					☐
	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	226 – 254 V	V	White to blue	390 – 440 V	V
	Blue to neutral	226 – 254 V	V	Blue to red	390 – 440 V	V
	Conduct a service connection test on all installations where the service connections have been disturbed.					☐

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. This sheet is a record of commissioning and is required for the Handover Certificate.
4. Attach as-built drawings and datasheets to this sheet and send to relevant regional asset manager.

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