

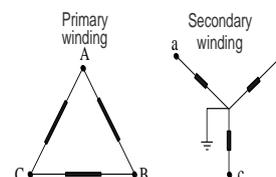
DISTRIBUTION COMMISSIONING FORM (DCF) 3.1 – MPS Distribution Transformer - Commissioning



Purpose: This instruction covers the testing and commissioning of new or replacement modular package substation (MPS) pad-mounted transformers up to 750 kVA before energisation.

For more information refer to the *Distribution Commissioning Forms Guideline (EDM 34137510)*

Notes: The following tests and checks must be carried out after installation and before the transformer is put into service.



Address/Pole No.			
Work Package No.		SPIDAWeb Pick ID:	

1. Insulation Resistance Test

Record the insulation resistance test results after 1 minute of testing.

	Test Connection	Test Voltage	Resistance	Expected Values
Insulation resistance test on the transformer winding (Short circuit all winding terminals of the same voltage level together.)	Primary/high voltage (HV) to tank	2.5 kV	Ω	>1 GΩ
	Primary/HV to secondary/LV	1 kV	Ω	>100 MΩ
	Secondary/LV to tank	1 kV	Ω	>100 MΩ
Insulation resistance test on the low voltage (LV) board busbar (LV fuse ways open, including the transformer LV disconnecter)	Red to white phase	1 kV	Ω	>100 MΩ
	White to blue phase	1 kV	Ω	>100 MΩ
	Blue to red phase	1 kV	Ω	>100 MΩ
	Red phase to earth	1 kV	Ω	>100 MΩ
	White phase to earth	1 kV	Ω	>100 MΩ
	Blue phase to earth	1 kV	Ω	>100 MΩ

2. Handover of Responsibility for the Completion of Item 1

I hereby certify that item 1 has been completed with satisfactory results.			
Tested by		NAC	
Signature		Date & Time	

3. Installation and Construction Checks

Inspect the following: 1. rating plate 2. tank and bushings 3. tap setting 4. oil level 5. HV terminations 6. LV terminations 7. neutral connection 8. MEN/N-E connections	Transformer installed as per construction standards and applicable design drawings.	
	Transformer matches system voltage.	
	Transformer tap is at the position as per network planning. Tap pos.	
	Transformer oil level satisfactory (if visible).	
	Transformer bushings and tank in good condition (no oil leaks).	
	HV cables properly terminated and connected.	
	The dead end plugs are correctly installed (transformers with 2 sets of HV bushings).	
	LV cables properly terminated and connected.	
Neutral connected and earthed and MEN/N -E link connected.		
All SPIDAWeb labels fitted and numbered correctly as per SPIDAWeb sheet.		
LV lead connections to the transformer LV bushings are correct as per construction standards (as per manufactures for new connection) or as per markings in item 3.1.4.14 of the decommissioning sheet (for replacement transformers).		

4. Handover of Responsibility for the Completion of Items 1 & 3

I hereby certify that item 1 and 3 have been completed with satisfactory results.			
Tested by		NAC	
Signature		Date & Time	

5. Pre-energising checks

1	Ensure that the earth resistance has been tested and is acceptable. DCF 4.1 completed and attached.	
2	Ensure all electrical connections have been completed, including MEN/N-E connections.	

6. Energisation of Transformer without Load

Energisation of a transformer without load (LV fuse ways open, including the transformer LV disconnecter)	Confirm the correct HV fuse type and rating. Record rating	A	
	Energise transformer as per the switching program (and check for abnormal noise).		
	Measured secondary voltages phase to neutral within acceptable range (216–253 V): R-N: volts; W-N: volts; B-N: volts		
	Measured secondary voltage between phases within acceptable range (376–440 V): R-W: volts; W-B: volts; B-R: volts		
	Phase rotation test result:	Phase rotation test: (123 or ABC or RWB)	

7. LV Phase Out Test

Conduct a phase-out test on open points of the LV network where the LV supply is coming from another transformer.	<p>Conduct the phase-out test under NOCC switching program on ALL 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 interconnections of transformers are made or can be made for operational purposes.</p> <ol style="list-style-type: none"> 1. If the LV conductors are energised from an interconnected transformer, conduct the phase-out test at the new transformer's LV disconnecter or fuse box. 2. If the LV conductors are not energised, proceed to item 8 (ENERGISATION OF TRANSFORMER WITH LOAD) and conduct the phase-out test on normally open points where it can be interconnected from another transformer.
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8. Energisation of Transformer with Load

Energisation of a transformer with load (close the LV disconnecter before closing the fuse ways)	Close the LV disconnecter	
	Check that the LV fuse switches are healthy and energise the LV circuits as per the switching program.	
	Ensure that the measured secondary voltage for phase to neutral is within an acceptable range (216–253 V): R-N: volts; W-N: volts; B-N: volts	
	Ensure that the measured secondary voltage between phases is within an acceptable range (376–440 V): R-W: volts; W-B: volts; B-R: volts	
	Record final tap position	
	Conduct a service connection test on all installations where the service connections have been disturbed.	

9. Handover of Responsibility

I hereby certify that all items have been completed with satisfactory results and transfer control to the network operating authority.			
Commissioned by		NAC	
Signature		Date & Time	

1. Ensure the work area is left tidy with no hazards to the public.
2. Hand over responsibility to the operating authority.
3. The completed form must be returned to the project file/work pack.