

DISTRIBUTION COMMISSIONING FORM (DCF) 2.4 – High Voltage Paper Insulated Screened Cable



Purpose: This instruction covers the testing and commissioning of all replacements or new installations of high voltage paper-insulated screened cable.

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

Note: The following tests must be carried out after installation, repair or jointing and before the cable is put into service.

Work Package No:		SPIDAWeb Pick ID:	
Test Site:			
Location of Cable:	From:		
	To:		

1. Cable Description

Rated Voltage:	kV	Length of cable (approximately)	m	No of in-line joints:	
Size of Cable	mm ²	Cable Function	Transformer	Feeder Cable	

2. Visual Inspection and Safety Check

<ul style="list-style-type: none"> • Ring main switch • Ring main earth switch • Cap test points • Cable • Cable surge arresters 	Does the construction comply with the distribution construction standards and applicable design drawings?	
	Is the switchgear switch in the OFF position?	N/A
	Check the equipment mimic diagram to confirm the earth switch position. Is in the ON position?	N/A
	Has the interlock been disengaged to access the cable/compartments for test purposes?	
	Have the cables been de-energised (with an approved testing device) before proceeding further?	
	Is the earthing system complete, undamaged and bonded to earth points?	
	Is the cable/equipment free from physical damage?	
	Has the cable been clearly marked with each phase colour and labelled (if applicable)?	
Have the surge arresters been disconnected from the cable terminations (if applicable)?		

3. End to End Phasing Test

Use a resistor box in conjunction with a 500 V insulation resistance tester to identify the cable end and phases.	Test Connection	Resistor Values	Test Results
	Red phase – screen	MΩ	MΩ
	White phase – screen	MΩ	MΩ
	Blue phase – screen	MΩ	MΩ

4. Insulation Resistance Test

Conduct an insulation resistance test for 1 to 10 minutes (subject to the length of the cable) or until the reading is stable. Use a 5 kV insulation resistance tester between each phase conductor and the corresponding cable screen	Test Connection	Minimum Values	Test Results
	Red to (white & blue) phase & earth/screen	>200 MΩ	MΩ
	White (red & blue) phase & earth/screen	>200 MΩ	MΩ
	Blue to (red & white) phase & earth/screen	>200 MΩ	MΩ
	Bond all conductors and test between phases and earth.	>200 MΩ	MΩ

5. High Voltage (HIPOT) Test

Conduct a phase-to-sheath/earth test (with the screen, lead and armour together as per Western Power procedures *Testing Of High Voltage Paper Insulated Screened Cables (EDM 21964117)*).

This test can be performed using a single-output (negative) HIPOT tester or a positive and negative output HIPOT tester. Bond all phase conductors and connect to the negative output of the HIPOT test set. Apply DC HV according to the cable-designated voltage or system voltage, whichever is the lesser, for 15 minutes as per the table below. The test is acceptable only if no breakdown occurs.

Cable-designated or System Voltage (kV)	New Cables (kV)	Service-aged Cables (kV)
6.35/11.0	25.0	20.0
12.7/22.0	50.0	40.0
19.0/33.0	75.0	60.0
All phase conductors to earth (screen, lead and armour together)		kV Leakage Current μA

Paper-Insulated Screened Cables (as per Western Power procedures))						
Connection			Voltage Peak	Test Duration	Start Leakage (mA)	Finish leakage (mA)
R	to	W + B + E		15 min		
W	to	R + B + E		15 min		
B	to	R + W + E		15 min		

6. Insulation Resistance Test (Post-HIPOT Test)

Conduct an insulation resistance test for 1 to 10 minutes (subject to the length of the cable) or until the reading is stable. Use a 5 kV insulation resistance tester between each phase conductor and the corresponding cable screen	Test Connection	Expected Values	Test Results
	Red to (white & blue) phase & earth/screen	>200 MΩ	MΩ
	White (red & blue) phase & earth/screen	>200 MΩ	MΩ
	Blue to (red & white) phase & earth/screen	>200 MΩ	MΩ
	Bond all conductors and test between phases and earth.	>200 MΩ	MΩ

7. Cable Termination Checks

Ensure all the cable connections and terminations are made and tightened to the required manufacturer standard.	
Ensure all the cables are clearly and correctly labelled.	

The person responsible for commissioning must sign this document before energisation.

8. Handover of Responsibility for the Completion of Items 1-7

I hereby certify that items 1 to 7 have been completed with satisfactory results and transfer control to the person responsible for commissioning.			
Testing officer/cable jointer/CPM		NAC	
Signature		Date & Time	

9. Handover of Responsibility

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

Note: Phase out under NOCC switching schedules across the normally open point, if applicable.

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.