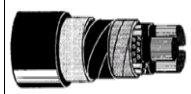
DISTRIBUTION COMMISSIONING TEST SHEET – HIGH VOLTAGE TRANSITION-JOINTED CABLES
HPC-4DL-07-0008-2014

This commissioning test sheet covers the checking, testing and commissioning of all replacement or new installations of high voltage mixed cable.



NOTE: Mixed cables refer to cables with differing insulation materials and/or construction, which are inseparably linked by transition joints. Whenever possible, the testing of individual cables comprising a mixed cable circuit should be completed before the cables are inseparably linked. Tests must be carried out after the installation, alteration, repair or cut-in 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 cable from the equipment on both sides and make the area safe. If cable cannot be disconnected ensure that the equipment connected to cable will not be affected. If the end side of the cable cannot be positively isolated, a second person should stand guard at the end of the cable during tests and a two-way radio must be used for communication.

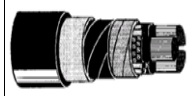
DATE:		**Project No.**		**Name of Officer**	
Test Site					
Location of Cable:	**From:**			**To:**	

1. CABLE DESCRIPTION

Rated Voltage	kV	Length of cable (approx.)	m		
Cable size	mm^2	No. of in-line joints		Cable function	Transformer cable ☐ Feeder cable ☐

2. VISUAL INSPECTION AND SAFETY CHECK

Inspect the following • Cable • Cable surge arresters	1	Check that the installation complies with the distribution construction standards and applicable design drawings.	☐
	2	Check the supply to the cable, that it is switched off and isolated as per switching program and permit.	☐
	3	Confirm that the cable is de-energised (with approved testing device).	☐
	4	Ensure that the earthing system is complete, undamaged and bonded to earth points.	☐
	5	Wherever possible, check that there is no physical damage to the cable or equipment.	☐
	6	Check that the cable is clearly marked with each phase colour and labelled (if applicable).	☐
	7	Ensure the surge arrestors are disconnected from the cable terminations (if applicable).	☐



3. END TO END PHASING TEST

	Test Connection	Resistor Values	Test Results
Using the three (3) phase resistor box in conjunction with a 500 V insulation resistance tester test to identify the correct cable end and phasing.	Red phase to neutral	MΩ	MΩ
	White phase to neutral	MΩ	MΩ
	Blue phase to neutral	MΩ	MΩ

4. INSULATION RESISTANCE TEST

	Test Connection	Minimum Values		Test Results
		Belted	Screened	
Use a 5 kV insulation resistance tester for 1 to 10 minutes (subject to the length of the cable) or until the reading is stable, between each phase conductor and the corresponding cable screen. (Note: 1,000 MΩ = 1 GΩ)	Red phase to (white & blue) & earth/screen	>200 MΩ	>500 MΩ	Ω
	White phase to (blue & red) & earth/screen			Ω
	Blue phase to (red & white) & earth/screen			Ω
	Bond all conductors and test between phases and earth			Ω

Confirm cables have been discharged after each test. ☐

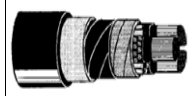
5. HANDOVER OF RESPONSIBILITY FOR THE COMPLETION OF SECTIONS 1 TO 4

I hereby certify that sections 1 to 4 have been completed with satisfactory results and transfer responsibility to the commissioning officer.

Testing Officer/Cable Jointer/CPM: _____ Pay Number: _____

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

The commissioning officer must sign this document before energisation.



6. VERY LOW FREQUENCY (VLF) TEST

	Value	Result
Set the VLF tester to apply the required voltage @ 0.01 to 0.1 Hz frequency (subject to the length of the cable) for duration of 60 minutes between phases to screen (earth). Record the applied voltage:	_____(kV)	Pass ☐ Fail ☐

Repetitive or successive VLF testing of the cable should be avoided.
The test is performed using a VLF tester. Test will be carried out between conductors and screens (which shall be earthed) for the duration of 60 minutes at a voltage of $3V_N$ @ 0.1 Hz as per the below table. Test will return acceptable results when no breakdown occurs.

Note: 1) For True Sine Wave VLF testers, $V_{peak} = \sqrt{2} \times V_{rms}$. Test at V_{rms}
2) For Cosine-Rectangular Waveform VLF testers, $V_{peak} = V_{rms}$. Test at V_{peak}
3) Maintenance testing is at 80%. Acceptance testing for any cable that has previously been in service.
4) A further reduction to 60% should be applied to cables over 30 years old or PILC cables.

System Voltage (phase to phase)	Acceptance testing (Phase to Neutral)	Maintenance testing (phase to neutral)	System Voltage (phase to phase)	Acceptance testing (Phase to Neutral)	Maintenance testing (phase to neutral)
6.6 kV	9 kV rms (12 kV peak)	7.2 kV rms (10 kV peak)	22 kV	27 kV rms (38 kV peak)	21.6 kV rms (31 kV peak)
11 kV	14 kV rms (19 kV peak)	11.2 kV rms (16 kV peak)	33 kV	41 kV rms (57 kV peak)	32.8 kV rms (46 kV peak)

AC (VLF) Tester – Triplex or Single Phase XLPE Cables					
Connection	Voltage Peak	Test Duration	Record or Check		
			Start Leakage Current (mA)	Finish Leakage Current (mA)	Pass ☐ Fail ☐
R & W & B to E		60 min			

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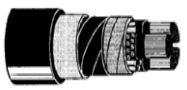

7. INSULATION RESISTANCE TEST (POST-VLF TEST)

	Test Connection	Minimum Values		Test Results
		Belted	Screened	
Conduct an insulation resistance test for 1 to 10 minutes (subject to the length of the cable) or until the reading is stable. After the VLF test, use a 5 kV insulation resistance tester between phase to phase and earth. Record the measured values. (Note: 1,000 MΩ = 1 GΩ)	Red phase to (white & blue) & earth/screen	>200 MΩ	>500 MΩ	Ω
	White phase to (blue & red) & earth/screen			Ω
	Blue phase to (red & white) & earth/screen			Ω

Confirm cables have been discharged after each test.	☐

8. CABLE TERMINATION CHECKS

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

9. HANDOVER OF RESPONSIBILITY FOR THE COMPLETION OF SECTIONS 7 TO 8

I hereby certify that sections 7 to 8 have been completed with satisfactory results and transfer responsibility to the commissioning officer.

VLF Testing Officer: _____ Pay Number: _____

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

10. 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