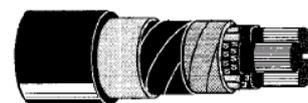


DISTRIBUTION COMMISSIONING FORM (DCF) 2.3 – High Voltage Paper Insulated Belted Cable



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

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

Note: The following tests must be carried out after installation, alteration, 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	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 the switch in the ON position?	N/A
	Has the interlock been disengaged to access the cable/compartment 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

A resistor box is generally used 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. This test is to be carried out using a 5 kV insulation resistance tester between conductor to conductor and conductors to earth.	Test Connection		Minimum Values	Test Results
	Red to (white & blue) phase & earth/screen		>200 MΩ	MΩ
	White to (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

A) Phase-to-Earth Test		B) Phase-to-Phase Test	
Cable-designated or system voltage	Cable-designated or system voltage	Cable-designated or system voltage	Between all conductors-to-sheath belted cables
3.8/6.6 kV	3.8/6.6 kV	3.8/6.6 kV	16.0 kV
6.35/11 kV	6.35/11 kV	6.35/11 kV	27.0 kV

5.A Phase to Earth (Lead and Armour Together) Test

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 high voltage according to the cable designated voltage or system voltage, whichever is the lesser, for 15 minutes as per the above table. The test is acceptable only if no breakdown occurs.

All phase conductors to earth (lead and armour together)	kV	Leakage Current μA
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5.B Phase to Phase Test

This test shall be performed exclusively using a positive and negative output hipot tester. Both the lead sheath and armour should be earthed for this test. Apply DC high voltage according to the cable-designated voltage for 15 minutes as per the above table (Section 5).

	kV	Leakage Current
Red to blue		μA
Blue to white		μA
White to red		μA

Paper-Insulated Belted Cables (as per Western Power procedures EDM 21965356)						
Connection			Voltage Peak	Test Duration	Start Leakage (mA)	Finish leakage (mA)
R+W+B	To	E		15 min		
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. This test is to be carried out using a 5 kV insulation resistance tester between conductor to conductor and conductors to earth.	Test Connection	Minimum Values	Test Results
	Red to (white & blue) phase & earth/screen	>200 MΩ	MΩ
	White to (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

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

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.	

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 joiner/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.