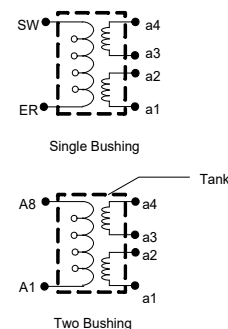


## DISTRIBUTION COMMISSIONING FORM (DCF) 3.3 – Single phase transformer (Pole mounted/Pad mounted)



The *Distribution Commissioning Forms Guideline (EDM 34137510)* must be referenced for guidance when completing this form.

**Purpose:** This instruction covers the testing and commissioning of all replacements or new installations of single-phase pole mounted/pad-mounted) transformers up to 50 kVA before energisation.

**Notes:** The following tests and checks must be carried out after installation and before the transformer is put into service. Bolts and screws in all electrical connections across the Western Power network must be properly tightened.

|                          |  |                          |  |
|--------------------------|--|--------------------------|--|
| <b>Address/Pole No.</b>  |  | <b>Work Package No.</b>  |  |
| <b>Manuf. Serial No.</b> |  | <b>SPIDAWeb Pick ID:</b> |  |

### 1. Insulation Resistance Test

|                                                                                                                                                                                                      |                                                                                                                   |              |            |                  |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|--------------|------------|------------------|--|
| Earth resistance                                                                                                                                                                                     | Ensure that the earth resistance test (DCF 4.1) has been completed with acceptable results prior to commissioning |              |            |                  |  |
| Ensure that the HV, LV and ER (single bushing Tx) connections are removed, and the transformer LV neutral is disconnected from the MEN/N-E connections. (Refer to the notes on Pg. 2 before testing) |                                                                                                                   |              |            |                  |  |
| Test                                                                                                                                                                                                 | Test Connection                                                                                                   | Test Voltage | Resistance | Expected Results |  |
| Insulation resistance test on the transformer windings<br>Measure resistance after 1 minute of testing for a stable reading.<br>* (see note 1)                                                       | A8 to tank (two-bushing Tx)                                                                                       | 2.5 kV       | Ω          | >1 GΩ            |  |
|                                                                                                                                                                                                      | SW to tank (single bushing Tx) *                                                                                  | 2.5 kV       | Ω          | >1 GΩ            |  |
|                                                                                                                                                                                                      | SW/A8 to a1                                                                                                       | 1 kV         | Ω          | >100 MΩ          |  |
|                                                                                                                                                                                                      | SW/A8 to a3                                                                                                       | 1 kV         | Ω          | >100 MΩ          |  |
|                                                                                                                                                                                                      | Tank to a1                                                                                                        | 1 kV         | Ω          | >100 MΩ          |  |
|                                                                                                                                                                                                      | Tank to a3                                                                                                        | 1 kV         | Ω          | >100 MΩ          |  |
| Continuity                                                                                                                                                                                           | SW to ER or A8 to A1                                                                                              | 1 kV         | Ω          | 0 Ω              |  |
|                                                                                                                                                                                                      | a1 to a2                                                                                                          | 1 kV         | Ω          | 0 Ω              |  |
|                                                                                                                                                                                                      | a3 to a4                                                                                                          | 1 kV         | Ω          | 0 Ω              |  |

### 2. Installation and Construction Checks

|                                                                                                                                                                                                                                                     |                                                                                                        |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--|
| Inspect the following:<br><ul style="list-style-type: none"> <li>rating plate</li> <li>tank and bushings</li> <li>tap setting</li> <li>HV terminations</li> <li>LV terminations</li> <li>neutral connection</li> <li>MEN/N-E connections</li> </ul> | Transformer matches system voltage.                                                                    |  |
|                                                                                                                                                                                                                                                     | Transformer tap is at the position as per design/network planning or previously installed transformer. |  |
|                                                                                                                                                                                                                                                     | Transformer installed as per design and construction standards and applicable design drawings.         |  |
|                                                                                                                                                                                                                                                     | Transformer bushings and tank in good condition (no oil leak).                                         |  |
|                                                                                                                                                                                                                                                     | The dead-end plugs are correctly installed (transformers with 2 sets of HV bushings).                  |  |
|                                                                                                                                                                                                                                                     | Neutral connected and earthed and MEN/N -E link connected.                                             |  |
|                                                                                                                                                                                                                                                     | ER (single bushing Tx) tank/earth connection is re-made                                                |  |
|                                                                                                                                                                                                                                                     | All SPIDAWeb labels fitted and numbered correctly as per SPIDAWeb sheet.                               |  |

### 3. Handover of Responsibility for the Completion of Items 1 & 2

|                                                                                                                                            |  |             |  |
|--------------------------------------------------------------------------------------------------------------------------------------------|--|-------------|--|
| I hereby certify that items 1 and 2 have been completed with satisfactory results and transfer control to the network operating authority. |  |             |  |
| Tested by                                                                                                                                  |  | NAC         |  |
| Signature                                                                                                                                  |  | Date & Time |  |

### 4. Energisation of the Transformer

|                                            |                                                                                                                                                                                 |   |  |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--|
| Energisation of a transformer without load | Confirm the correct HV fuse type and rating. Record fuse rating                                                                                                                 | A |  |
|                                            | If applicable, ensure all short-circuiting equipment has been removed from the LV network.                                                                                      |   |  |
|                                            | Energise the transformers HV as per the HV switching program (and check for abnormal noise). Record the switching program number:                                               |   |  |
|                                            | Record voltage at the secondary/LV side:<br>Expected values: 226–254V for 230V connections, 390–440V for 400V connections                                                       | V |  |
|                                            | Phase out (confirm polarity) across open LV disconnectors if available.                                                                                                         |   |  |
| Energisation of a transformer with load    | Confirm the correct HV fuse type and rating. Record fuse rating:                                                                                                                | A |  |
|                                            | Energise the LV mains in accordance with the LV switching program.<br>Check and record the secondary (LV) voltage:<br>Record the switching program number:                      |   |  |
|                                            | Disconnect the transformer from any interconnected transformer (if applicable).                                                                                                 |   |  |
|                                            | Conduct a service connection test on all installations where the service connections have been disturbed. Confirm voltages are within acceptable limits.                        |   |  |
|                                            | When erecting a new or replacement transformer, check the voltage at an existing LV point, if possible. Phase out (confirm polarity) across open LV disconnectors if available. |   |  |

### 5. 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                                                                                                                        |  | BNA         |  |
| 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. Return form to project file as record of commissioning.
4. After the on-site project officer signs off on the DCF, a scanned copy of the DCF must be attached to the relevant project documentation.

**Note:** Insulation test for Single-bushing transformer:

There are two types of single HV bushing transformer (SWER) configurations.

1. HV bushing (SW) and a tank earth stud only i.e., no external ER bushing (old ABB transformers): The one end (SW) of the HV winding is brought out through the large external bushing and the other is bolted to the inside of the transformer tank. This winding cannot be isolated from the tank and therefore cannot be 'insulation tested.'
2. HV bushing (SW) and a small external earth return bushing marked ER (new Tyree or ETEL transformers): The one end (SW) of the HV winding is brought out through the large external bushing and the other/neutral end is brought out through the ER bushing and bonded to the transformer tank by an earth link. In this case the HV winding can be 'insulation tested' by disconnecting the link between the small (ER) bushing and the tank. The earth link must be reconnected after testing is completed.