# T60 Transformer Types and Setup

## GE Publication No. GET-8433



**DESCRIPTION**

The T60 can protect a variety of power transformer types, as they are constructed, with no limitations on the transformer phase shift angle and connection group. Transformer settings are organized into two parts:

- *General settings* that include general information on the protected transformer, such as number of windings, etc.
- *Winding settings* that include type of connection, MVA, kV, phase shift angle between the transformer windings, etc.

**GENERAL SETTINGS**

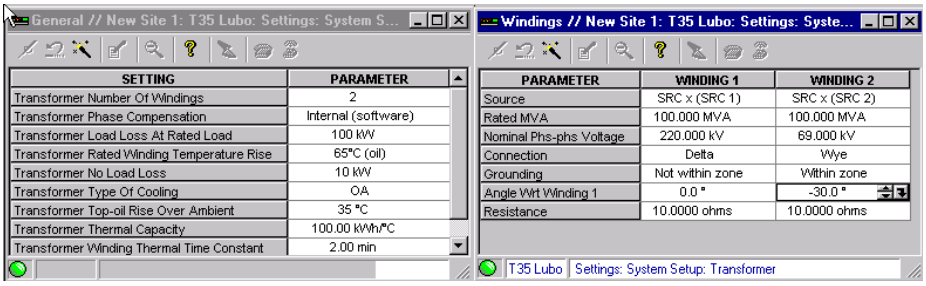
In the transformer general settings, the number of transformer windings and type of compensation (internal or external) must be specified. If "Internal" compensation is selected, the relay applies phase and magnitude compensation for the input currents. If "External" compensation is chosen, then the T60 requires the user to wire the secondary currents from the main CTs to the relay input terminals to match the current magnitudes and ensure the currents are measured in a unified direction with respect to the protected transformer (that is, all currents either in or out the transformer).

**WINDING SETTINGS**

The **GROUNDING** winding setting allows for two possible choices: "Within zone" and "Not within zone". For “Within zone”, the relay removes the zero-sequence currents before forming its differential signal; for “Not within zone”, zero-sequence removal is not forced. Usually, the Wye connected windings are grounded star, in which case "Within zone" setting should be chosen. Forced zero-sequence removal may be a useful feature for delta-connected windings if any kind of grounding is present within the transformer zone on the delta-side. This may be, for example, a cable section connected to a delta winding and producing significant zero-sequence charging current.

The **ANGLE WRT** setting calls for the ‘angle with respect to’. The Winding 1 angle WRT *must be zero* for all transformer configurations and the angles for the other windings should be entered with respect to Winding 1. Negative values represent lagging angles.

A typical D/y30° configuration is shown below.


General // New Site 1: T35 Lubo: Settings: System S...
SETTING
PARAMETER
Transformer Number Of Windings
2
Transformer Phase Compensation
Internal (software)
Transformer Load Loss At Rated Load
100 kW
Transformer Rated Winding Temperature Rise
65°C (oil)
Transformer No Load Loss
10 kW
Transformer Type Of Cooling
OA
Transformer Top-oil Rise Over Ambient
35 °C
Transformer Thermal Capacity
100.00 kWh/°C
Transformer Winding Thermal Time Constant
2.00 min
Windings // New Site 1: T35 Lubo: Settings: Syste...
PARAMETER
WINDING 1
WINDING 2
Source
SRC x (SRC 1)
SRC x (SRC 2)
Rated MVA
100.000 MVA
100.000 MVA
Nominal Phs-phs Voltage
220.000 kV
69.000 kV
Connection
Delta
Wye
Grounding
Not within zone
Within zone
Angle Wrt Winding 1
0.0 °
-30.0 °
Resistance
10.0000 ohms
10.0000 ohms
T35 Lubo
Settings: System Setup: Transformer