TAL ENGINEERING

Controls that work!

Transformer & High voltage line Monitoring device

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Remote monitoring system of the distribution transformer and the high voltage line

The proposed system allows: Remotely test in real time or in a recorded manner all distribution transformers in the country, and receive data on voltage, current, temperature, etc. as well as receive automatic fault notifications for each of the of the parameters for all transformers throughout the country.

The system enables:

1. Examine remotely in real time or in a recorded manner the output voltage and current along with other parameters (oil level, temperature, pressure, etc.) for the transformer.
2. Receive automatic messages about fault occurrence within the transformer i.e., output voltage drop, temperature rise, low oil level, etc.
3. An automated computerized fault log accessible via the Internet.
4. View the voltage drops on the high voltage network to which the transformers are connected.

!!! The system is not connected to the high voltage network!!!

System structure

The system consists of two parts:

1. Monitoring box - installed on the post next to the transformer.
2. Software package - installed on cloud

*The monitoring box is linked to the cloud via mobile internet

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The system regularly collects and records the following data from the distribution transformer:

1. Transformer temperature
2. The oil level of the transformer
3. Voltage of each of the output phases
4. The current in each of the output phases
5. The current in the zero conductor
6. Imbalance between the phases
7. The current lag behind the voltage in each of the output phases
8. Harmonic currents in each of the output phases
9. The amount of energy the transformer provided in KWh each month or other period of time, for example between two consecutive initiated readings
10. Power drops along the high voltage network !!! Between any two consecutive transformers.

Each of the above data can be viewed in real time! For example: you can enter the transformer and see the output current at any given moment or temp. Etc.

For each of the above data the data history (recording size) can be set for close examination.

The data is continuously transmitted to the cloud

Fault alerts

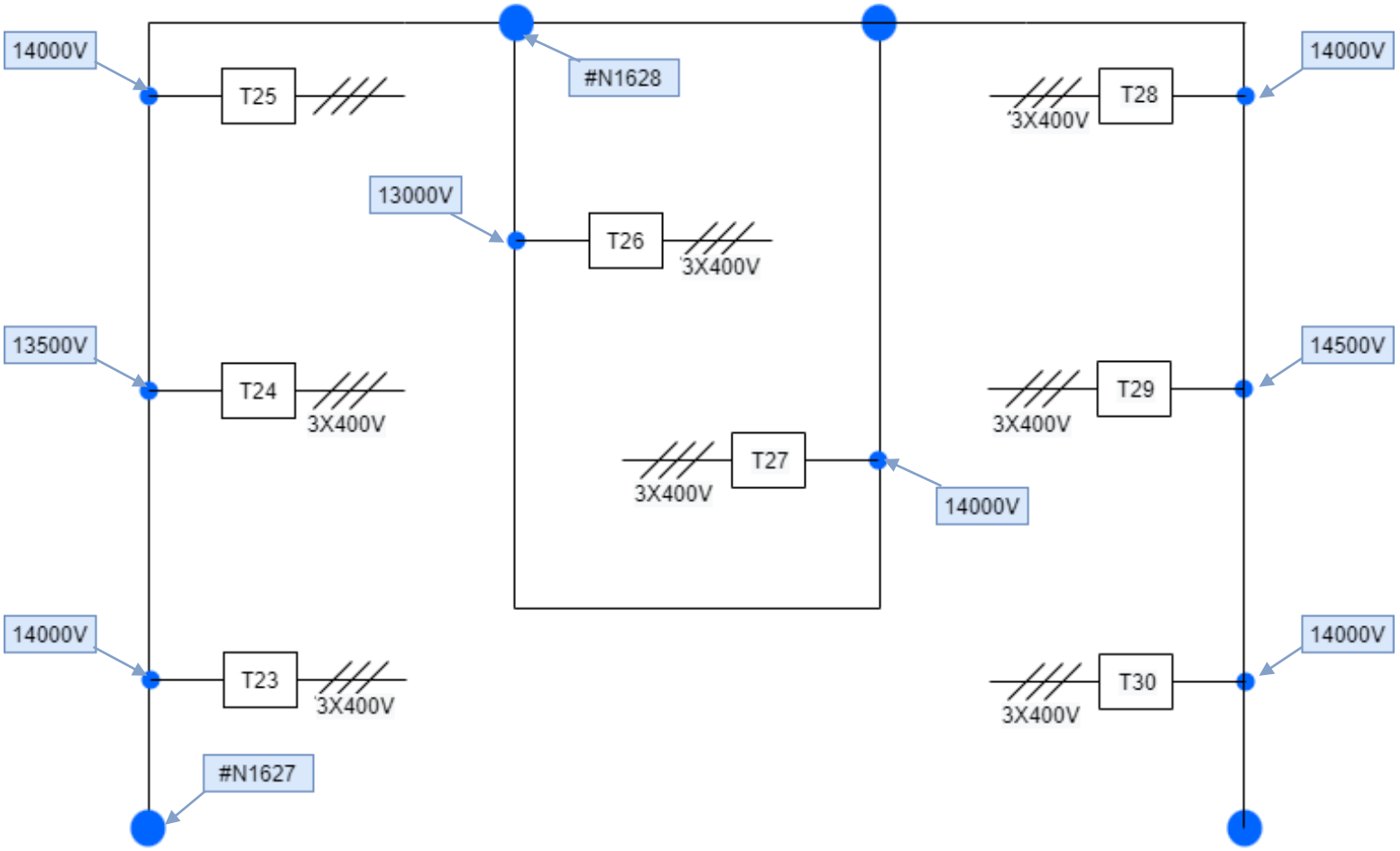
The system gives an immediate automatic alert, in real time, directly to the data center, if one of the following parameters exceeds a preset value.

The alert is received with the nature of the fault and the transformer number:

1. Transformer temperature
2. The level of the oil within the transformer
3. Voltage drop / raise at each of the phases
4. The current in each of the output phases
5. The current in the zero conductor
6. Imbalance between phases
7. Angle of current lag after voltage in each of the output phases
8. Current harmonics in each of the phases
9. The amount of energy supplied in a specified period of time
10. A voltage cut-off or drop between two transformer posts along the high voltage network.

The alert is automatically recorded in the transformer event history and fault log

Monitor the whole NET



*** T23 = Transformer number 23
*** #N1627 = Net number

FAULT EXAMPLES

1. Voltage fault at T24 (#N1627) (Address :..)
2. Voltage fault at T29 (#N1627) (Address :..)
3. Voltage fault at T26 (#N1628) (Address :..)
4. Oil leaking T30 (#N1627) (Address :..)
5. Temperature rising : #55C^{o} – T28 (#N1627) (Address :..)

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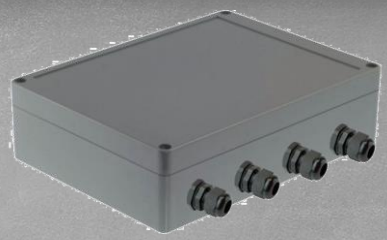

Advantages for Transformer Manufacturers

Real-time oil level monitoring allows use of smaller oil containers.

Advantages for Private users (Hotels- Factories, etc....)

User can monitor output & input voltage, current, temperature and oil level by using mobile application and gets real-time notifications

Advantages for High-voltage electric net maintenance

High-voltage net maintenance technical managers can monitor the whole network online and get information on voltages at each node. Maintenance costs can be thus reduced.

Main Features

- Cloud connectivity
- Real-time fault monitoring
- Monitors output voltage
- Monitors current
- Monitors temperature
- Monitors oil level

Optional

- Monitoring voltage and current legging
- Monitoring Current harmonics

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