



THE FIRE EXPERTS



HAVE YOU EVER IMAGINED THE **IMPACT FIRE**  
CAN HAVE ON **POWER SUPPLY**?



## Nitrogen Injection Fire Prevention Extinguishing System for Oil Transformers

Protecting Your Oil Filled Electrical Transformers

SCAN & EXPLORE



## NITROGEN INJECTION FIRE PREVENTION & PROTECTION EXTINGUISHING SYSTEM

Our passion for innovation coupled with in-depth research and profound experience in fire protection enables us to create fire extinguishing & detection systems and solutions that are ingenious with quality par excellence. We understand that one of the key locations where fire safety is highly important is the protection of oil filled transformers. So here's introducing a world class product proudly made in India.

### SYSTEM DESCRIPTION:

We have developed Nitrogen Injection Fire Prevention & Extinguishing System to protect transformers from fire and blast occurred from both internal and external faults.

### INTERNAL FAULT:

In case of fault happened inside the transformer due to arcing, in core and coil dielectric interruption, ruptures and twist of the winding improper grounding etc.

### EXTERNAL FAULT:

External fire can erupts due to OLTC, oil leaks, gasket rupture, bushing fire weld cord, defects of forced cooling fans, Buchholz Relay, exit of the current transformer of the bushings, bursting of bushings, improper/loosening of cable terminations, faults in transmission lines External bush/guess fires etc.

We use highly sophisticated hollow-metallic tube based linear heat detection system. Our PLC based NIFPES system receives the data from signal junction box to activate the NIFPES.

### BASIC PRINCIPLE:

Drain and Stir

### DRAIN:

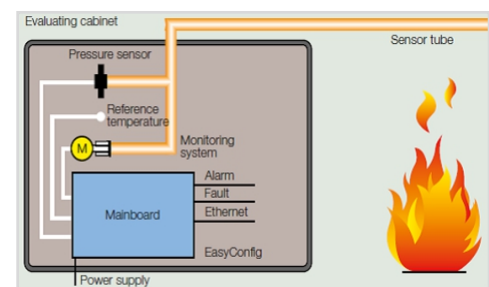
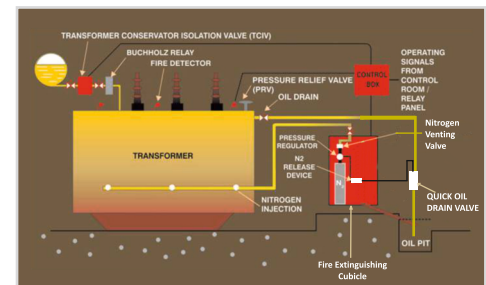
To reduce fuel volume and create space to avoid development of abnormal pressure inside the transformer tank which can lead to rupture of tank.



NITROGEN INJECTION  
SUPPRESSION UNIT



HEAT DETECTION TUBE  
ON A TRANSFORMER



## STIR:

The fire extinguishing cubicle shall house a pressurized nitrogen cylinder which is connected to the oil tank of transformer at bottom. Nitrogen will be injected from the bottom to stir with oil to bring the oil temperature below the oil flash point. Nitrogen works as an isolation between the oil and the oxygen to reduce the risk of fire and also create a N<sub>2</sub> blanket at top of the transformer.

## HEAT SENSING MECHANISM:

The temperature of oil is measured by scanning entire top surface of transformer tank cover using liner heat sensing controller. The sensor is adopted from proven field performance for Rim Seal fire protection system installed on petroleum storage tank. Advantages of this sensor are

- Total top cover surface of transformer temperature is scanned on continuous bases.
- Two set of potential free contact permitting setting of alarm and trip command.
- With measure the rise in temperature by using linear heat detector. We can set tripping of transformer much below flash point temperature after keeping reasonable margin for temporary over loading.

## OPERATION OF NITROGEN INJECTION FIRE PROTECTION EXTINGUISHING SYSTEM:

Nitrogen Injection Fire Protection System (NIFPES) prevents oil tank explosion or rapture possible oil fire in event of minor of arcing due to internal faults (such as failure of winding transformer or any other source) in Transformer in case of rise in Temperature inside transformer due to various reasons, PLC based NIFPES system receives internal inherent Faults / Feedback/Trip Signals from Transformer Panel. In case of any incident PLC based NIFPES system activates electrically operated Transformer Conservator Isolation Valve/Oil Drain Value/Nitrogen Injection value etc. which isolate the oil conservator tank from main tank, drains out oil from transformer into the oil pit and nitrogen gas is injected which creates a layer on rest of the oil to avoid any contact with Atmospheric Oxygen.

- a) Electrically operated steel cage ball valve permits complete opening of oil flow between conservator and main tank thus maintaining original design of OEM.
- b) The system also opens the drain value (Steel Cage Ball Value) completely, permitting for fastest evacuation of oil from the system.
- c) The nitrogen purging system will start and make a layer inside the transformer to protect the transformer.

## OUR UNIQUE EXTERNAL FIRE SUPPRESSION SYSTEM SUPPRESSES THE FIRE AND CAN ALSO COOL THE SYSTEM TO MINIMIZE ANY FURTHER DAMAGE.

1. Low Pressure Water Mist Fire Suppression for External Suppression, consisting of pre-pressurised vessel to operate for 2 minutes (Minimum)
2. High Velocity Water Spray System for External Suppression, to be connected to existing Fire Hydrant System



## FEATURES & BENEFITS:

- Detection of Internal or External Fire by state-of-the-Art Heat / Fire Temperature Sensors capable of configure temperature range from -40 C to +160 C.
- The temperature settings can be set at site suitable to local ambient conditions - Class A1 - certified detector as per En 54-22 (Standard for Linear Heat Detectors) by UL/VdS.
- The detector is having an inbuilt memory to store Alarms & History, can record up to 16 MN events (with installed SD Card).
- Auto and Manual Extinguishing System, from field and Control Room.
- Total Length of External Metallic Detector: 15-115 Metres.
- Automatic self-diagnostic features for monitoring system's health.
- The drain point can directly get connected to Oil drain Pit. The oil drain pit in this system can be kept above ground which results in easier maintenance of the pit, as well as a huge reduction in cost of other civil work which is required in case of underground tanks.
- Microprocessor / PLC based system ensures quickest response for activation of the system.
- SCADA connectivity / Remote monitoring / SMS / Email alerts, etc. are other additional features that can be made available.
- Easy retro-fitted with shut down time 2 days (maximum) and without effecting the transformer body.
- We can also offer upgraded & advanced NIFPES with majority items having approved & UL / FM / Vds / CE etc.

## VIMAL FIRE CONTROLS PRIVATE LIMITED

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