

**SPECIFICATION FOR NITROGEN INJECTION FIRE PREVENTION AND EXTINGUISHING SYSTEM**

1. Tenderer have to quote unit F.O.R. destination prices separately for supply, erection, testing and commissioning of nitrogen injection fire prevention and extinguishing system. The cost of this system shall be included while working out the comparative offer. The Nitrogen Injection Fire Prevention & Extinguishing System should have the following-
2. The Nitrogen Injection Fire Prevention and Extinguishing System shall be suitable to operate on 220V DC which is normally available at 220 KV GSS in our system. The Nitrogen Injection Fire Prevention and Extinguishing System shall minimum consist of the following and included in suppliers scope of supplies. However, any other accessories require for satisfactory operation of system (except civil works) shall be supplied by supplier free of cost.
  - i) Fire Extinguishing cubical containing Nitrogen cylinder with regulator and falling pressure Electrical contact manometer, oil drain pipe with mechanical quick drain valve, electro mechanical control equipment for oil drain and predetermined regulated Nitrogen release, pressure monitoring switch for back up protection for Nitrogen release and system monitoring. This fire extinguishing cubical is to be placed on plinth at about 6 meters away from transformer plinth, to be constructed by purchaser.
  - ii) Control Box with activating, monitoring device and line fault indicators and D.C. to D.C. converter from 220V to 110 V.D.C. This control box is to be placed in control room.
  - iii) Pre stressed non returning valve to be fitted in the conservator pipe operating mechanically, on transformer oil flow rate with electrical signal for monitoring.
  - iv) Fire detectors to be placed on the transformer tank top cover.
  - v) Signal Box for placing on the tank side wall.
  - vi) Oil drain and Nitrogen opening with gate valves on transformer tank, flanges with dummy piece in conservator pipe and fire detectors brackets on transformer top cover.
  - vii) Pipe connection between transformer – Fire extinguishing cubical and oil pit.
  - viii) Cabling on transformer top cover and inter cabling between transformer-control box and Fire extinguishing cubicle. The details and size of cables used are as under which are to be provided by the supplier.
    - a) Fire survival cable 4 core x 1.5 mm sq. for connecting al fire detectors in parallel and terminating in signal box.
    - b) FRLS 4 core x 1.5 mm sq. cable for connecting

- Pre stressed non return valve (PNRV) to Signal Box.
- Fire extinguishing cubical for 230 – Volt A.C., single phase panel light supply.
- Connection from relay panel to control box.
- Connection from D.C. Panel to control box through D.C. converter.

- c) FRLS 12 Core x 1.5 mm sq. Cable for connection between transformer signal box to control and between control box to Fire extinguishing cubicle. (all control cables shall be multi stranded cables)
- ix) Potential free contacts for required Electrical signals on relay panel for connecting to control box.

All the civil works such as construction of plinth, oil pit below the transformer shall be in user's scope. However, supplier shall furnish detailed drawing & design of the same.

Following information/drawings to be furnished along with the offer:-

1. Technical leaflets, dimensional drawing, GA drawing etc. of the cubical and other parts.
2. Size of the mounting brackets for fire sensors (Drawing to be furnished).
3. Drawing of the pre stressed non-return valve giving all information necessary for interfacing with transformer conservator pipe work.
4. Foundation details of the fire-extinguishing cubicle.
5. GA drawing of signal box indicating the mounting details clearly. Please note that signal box is to be quoted optionally as cable connection may be terminated in the transformer- marshalling box. Cable along with glands and sealing kits for terminating connections from fire sensors and PNRV etc. to M. Box or signal box shall be in the scope of the supplier of F.E. system.
6. Transformer will be provided with following valves on tank-
  - (a) 150NB valve on both sides of transformer for quick oil drain.
  - (b) 3 nos, 25NB valves on both sides of bottom tank for nitrogen injection purpose.
7. Supplier to quote separately for installation & pre-commissioning tests of the fire extinguishing system.
8. Supplier shall also quote the rate of cable per mtr in case of any addition/deletion in cable qty.

Any information/items in addition to the above and/or is deemed necessary for the effective interfacing between the transformer fire prevention system and user's equipments and its successful operation at the substation shall be furnished by the supplier.

The supplier of fire prevention & extinguishing system shall also arrange necessary co-ordination of these activities.

### **Tests**

The nitrogen injection fire prevention & extinguishing system shall be subjected to the operational test at manufacturer's work in presence of user's representative. The manufacturer's test certificate of various

accessories of nitrogen injection fire prevention & extinguishing system shall be furnished at the time of inspection to the inspecting officer. Min. 3 weeks advance notice is to be given before inspection by our user's representative.

## Documents

Following documents should be supplied with the equipment:-

- (i) Erection & Commissioning manual- 5 copies per set
- (ii) Operation & maintenance manual – 5 copies per set
- (iii) Type and routine test certificates – 5 copies per set

Equipment should be suitable for working under following climatic conditions-

Max. Ambient temperature: 50°C  
Max. Daily avg. ambient temp.: 45°C  
Min. Ambient air temp.: -5°C  
Max. Relative humidity – 100%  
Seismic level – 0.3 g  
Max. Annual rainfall- 15 – 100 cm  
Intensity of solar radiation: 1.0kW/sq m  
Max. Wind load: 195kg/sq m  
Max. Altitude – 1000 mtr

All external surfaces of the fire extinguishing cubicle shall be painted with synthetic enamel paint to shade 632 of IS-5. Control box housed inside the control room shall be painted with synthetic enamel paint to shade 631 of IS-5.

  
25.1.16  
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