



SPECIFICATION.....

**"NTPL"MAKE
AUTOMATIC PROGRAMMABLE
6000A/50V LOW VOLTAGE HIGH DIRECT CURRENT INJECTION SET
(RECTIFIER)
SERIES: LVHDCNTAU
TYPE: 6000A50V**

The above Transformer Rectifier unit is perfectly suitable for dry out of stator windings of hydro generators /motors before measurement of IR values and HV test and any other circuit element having low resistance where high direct current injection is required during the process of testing.

Technical Specification:

| | | |
|----------------|---|--|
| Input Voltage | : | 415volts \pm 10%, 3 phase, 50Hz \pm 5%, AC. |
| Output Voltage | : | Rated Output 0 - 50V DC. |
| Output Current | : | Continuously variable 0 - 6000 Amps. DC having low ripple content. |
| Ripple | : | Less than 5%. |
| Duty Cycle | : | Continuous. |

The above test kit will be in multiple units' i.e.

- **Power Mains Control Panel with Air Circuit Breaker**
- **Microcontroller Based Automatic Control Unit**
- **3 Phase continuously variable motor operated Autotransformer**
- **Transformer Rectifier (Rectifier) Unit**

All the units will be provided with wheels and suitable lifting hooks for easy movements.

1. POWER MAINS CONTROL PANEL WITH AIR CIRCUIT BREAKER

Power Mains ON – OFF operation is done by means of an Air Circuit Breaker which is coupled to the over current trip circuit, under voltage trip circuit and other protective device like zero start interlock, over current protective device at LT side. An auxiliary main ON/OFF circuit with fuse arrangement is provided for control circuit only.



2. MICROCONTROLLER BASED AUTOMATIC CONTROL UNIT

- Power 'MAINS ON' lamp indication.
- Control ON-OFF switch along with 'CONTROL ON' lamp indication & fuse protection.
- Isolation transformer for control operation, auxiliary supply to meters and power supply for electronic PCBs.
- Injection circuit 'ON-OFF' push button along with lamp indications and 'EMERGENCY OFF' push button.
- INCREASE/DECREASE circuit to control motor operated Regulator. When Current Injection circuit is switched ON the regulator will rotate to increase the output test current at preset speed up to the preset test current level.
- In the Test Set-up two Test Modes are provided, a) Automatic & b) Manual.

Automatic Cycle: In this mode the test sequence will run automatically when a push button located close to the operator is activated.

Manual Mode: In this mode increase in current up to the required level will be controlled by the operator pushing a button and holding until the required current is reached. In this mode the current attained is operator dependent.

- Programmable microcontroller system will measure the time duration of current injection.
- One LCD display and key pad will be provided to set programs. This LCD will indicate the following :
 - DC output current.
 - DC output voltage.
 - Test /loading Duration
 - Protective status (if any, Over Current, Trip)
- Microcontroller based control system will enable output current to be injected in the test sample at the preset level and monitor current and time. As the current reaches the preset level the current will automatically try to maintain the preset level. The Timer will remain ON for the preset time and the current regulator will be gradually reduced to zero current after the preset time is elapsed. The Control Bandwidth of the Injected Current will be 3%, the High & Low Alarm will occur beyond $\pm 5\%$ of the Set Current.

PROECTION & INTERLOCK:

- Automatic tripping mechanism for protecting the Test Set-up against over loading/short circuit fault etc. Even if the current exceeds the preset over current range then at first 'OVER CURRENT' indication will glow & then if even then current increases the Test Set will trip, output current will be switched OFF & 'TRIP' enunciator will glow.



- There is also provided per phase protective device, which senses current in all the three phases thus giving rise to a signal sufficient to actuate a relay when current in any phase crosses the safe limit. On the other hand this anticipatory circuit protects diodes against unbalanced loading.
- “REGULATOR NOT AT ZERO’ will annunciate during testing. Zero start Interlocking will be provided to ensure that the current circuit cannot be energized unless the regulator is initially kept or brought back to zero position.

The whole control circuitry will be housed within a sheet metal cabinet properly treated and powder-coated.

3. REGULATOR UNIT

Oil cooled continuously variable autotransformer of suitable capacity providing smooth motor operated control from zero to maximum rated current. This variable three phase Auto- Transformer, which in turn supplies a variable voltage to the primary of a three phase rectifier transformer, secondary of which is connected to a phase connected rectifier stack using Silicon Diodes.

4. TRANSFORMER RECTIFIER UNIT (RECTIFIER):

- Three phase double wound Rectifier Transformer Bank will be oil cooled. Transformer windings will be of electrolytic grade copper.
- Secondary of this Transformer is connected to a phase connected rectifier stack using Silicon Diodes. The DC output is obtained from the Rectifier Bank output and star point of the transformer through an interphase transformer.
- Heavy current output terminals will be provided.

METERING:

Digital Ammeter for measurement of Current at the input side.

Digital Voltmeter for measurement of Voltage at the input side.

LCD display for output current & voltage indication.



OPTIONAL AT EXTRA COST:

TEMPERATURE OVERRIDE PROTECTION:

(This feature is valid if Temperature monitoring system is also procured)

Apart from the protection of the High DC Injector Set we may need attention to protect the equipment or component which is subjected to current loading. We can supply a six channel temperature scanner interfaced with our control system so that the Injected current will be controlled & monitored up to 6000A and will continue and current will be monitored at the preset value. But if the Temperature monitor exceeds allowed pre-set temperature 130⁰C, an alarm will give the first indication and the injector will trip if temperature monitored by any sensor is increased beyond the set limit.

ACCESSORIES:

Interconnecting cables among the above 4 units will be provided.

DOCUMENTS:

Operation Manual, Works Test Report, Warrantee Certificate will be supplied along with the set.
