



**PRODUCT STANDARD  
TURBINES & COMPRESSORS**

**TC 5 1812**

**REV 02**

**PAGE 1 OF 3**

**BOLT HEATING EQUIPMENT  
(ELECTRICAL)**

**APPLICATION :** The joint flange bolts of turbines need considerable pretensioning because of the longitudinal expansion which occurs under operating conditions. This pretensioning of the bolts can be achieved by either.

The application of suitably high mechanical force to the bolts when cold or heating the bolts and screwing down the nuts while in this hot condition.

The joint flange bolt heating unit is used for heating the bolts to allow the subsequent screwing down of the nuts to give the required preloading. The heating effect is generated by passing a high electric current through the bolt to be expanded (RESISTANCE HEATING).

**FUNCTION OF THE EQUIPMENT :** The function of the heating transformer is to convert the available mains current into a current suitable for the heating process. This current is then fed to the ends of the bolts through water-cooled leads and electrode.

**MODE OF OPERATION AND DESCRIPTION OF THE UNIT :** The units is connected to the mains by a power supply cable. Actuating the "ON/OFF" toggle switch on the front panel connects the primary side of the TRANSFORMER to the mains through water-cooled thyristors. The high primary voltage is stepped down to a lower secondary voltage. The THYRISTORS, the HEATING TRANSFORMER and the SECONDARY LEADS are WATER-COOLED and have flow monitors. The current flowing in the secondary-circuit, which depends on the series resistance's in this circuit (leads, electrodes, bolts), heats the bolts to the required temperature in approximately 2 to 10 minutes.

**TECHNICAL DATA :**

Heated power : 125/160 KVA at 50 % duty factor  
Primary Voltage : 380/415 V DC / 50 Hz 2 phase  
Secondary Voltage : 8.6 / 11.9 V  
Primary Current : 330/320 A at 50 % duty factor  
Secondary Current : 10/14 kA at 50 % duty factor  
Type of Control : SJTAKI TS 311-LA or equivalent indigenous design  
E 89100 – B 14 76 – S 1

FORMAT  
TD-201  
REV -00  
REF DOC

PREPARED BY:

**S.Mahesh Kumar**

APPROVED BY:

**M.Rosi Babu**

DATE: **10.03.04**

**COPY RIGHT AND CONFIDENTIAL**

The information on this document is the property of BHEL. It must not be used directly or indirectly in any way detrimental of company.



**PRODUCT STANDARD  
TURBINES & COMPRESSORS**

**TC 5 1812**

**REV 02**

**PAGE 2 OF 3**

**SCOPE OF SUPPLY :**

**1.0) List of Equipment :**

- 1.1) Low voltage fuse isolator with HRC fuses size 2/400 A – 1 No.
- 1.2) Heating transformer - 1 No.
- 1.3) Phase-angle control comprising : Thyristor box with N-type thyristors : 1 No.
- 1.4) Flow monitors in cooling water circuit : 2 Nos.
- 1.5) Secondary leads, water-cooled, 2 x 300 mm<sup>2</sup> , 3.5 m long – 2 Nos.
- 1.6) Cable spacer for clamping the secondary leads together – 3 Nos.
- 1.7) Primary supply cable 3 x 150 / 70 / 3 mm<sup>2</sup> , 25 m long – 1 No.
- 1.8) Water hoses 1 ” - 3.0 m long (water supply and discharge) - 2 Nos.
- 1.9) Hexagon bolts M16, Material 21 Cr Mo V 57 or equivalent.

**Material Code: TC 9751812003**

**FORMAT  
TD-202  
REV-00**

**COPY RIGHT AND CONFIDENTIAL**

The information on this document is the property of BHEL. It must not be used directly or indirectly in any way detrimental of company.





**PRODUCT STANDARD  
TURBINES & COMPRESSORS**

**TC 5 1812**

**REV 02**

**PAGE 4 OF 3**

**FORMAT  
TD-203  
REV-00**

**COPY RIGHT AND CONFIDENTIAL**  
The information on this document is the property of BHEL. It must not be used directly or indirectly in any way detrimental of company.