

## ELECTRICAL KEY TRANSMITTER

EKTs are used for controlling a signal or point or level crossing gate and releasing the apparatus when required. The key is normally kept locked in a transmitter at site and a similar key transmitter is fixed at a place from where the apparatus is controlled. Both the instruments are electrically interconnected and consist a galvanometer to indicate visually that a key is transmitted. For calling attention a bell is provided at both ends.

## WORKING PRINCIPLE

It works on the principle of Electromagnetism and is used in pair. One equipment is fixed at SM's room and the other equipment with key in lock position near the appliance, which is to be controlled. The key is transmitted as under:

## AT TRANSMITTING END

- Key is inserted in the EKT.
- Turned to RHS and held there.
- Galvo needle gets deflected to RHS

## AT RECEIVING END

- Galvo needle gets deflected to RHS.
- On getting the deflection key is turned to LHS and extracted.

**Note :** To attract the attention of operating person a buzzer/ magneto telephone is used.

## ELECTRICAL PARAMETERS

- Electromagnet coil Resistance : 12-15
- Minimum working voltage : 6.5 V
- Normal working voltage : 12 V
- Normal working current : 150-200 mA

## MAIN PARTS OF ELECTRICAL KEY TRANSMITTER

1. Cast iron case
2. Galvanometer
3. Electromagnet
4. Locking unit
  - a. Locking plunger
  - b. Switching plunger

5. Electrical contact unit
6. Key
7. Tappet lock
8. Wards and tumblers.

## DESCRIPTION OF PARTS

**Cast Iron Case:** It is in two parts.

Front Portion: It consists of a key hole and a galvanometer with weighted needle.

Back Portion : Consists of

**Electromagnet:** It is fixed in upper portion of the case. When energised, its main pole face attracts armature which in turn helps in releasing the key. The auxiliary pole face which is fixed behind the needle in the cover deflects the galvo needle.

**Electrical contact unit:** It consists of five nos. of contacts which are insulated from each other. Depending upon the position of the key i.e. "IN" and "OUT" or turned in EKT, these contacts make or break which in turn controls the line circuit.

- Contacts making, when key is "IN" 1&2, 3&4
- Contacts making, when key is "OUT" 3&4
- Contacts making, when key is turned 1&2, 3&5 turned to RHS.

**Locking Unit :** It consists of two plungers.

- **Locking Plunger :** It is placed on LHS in the unit and carries an insulated pin. When key is extracted plunger moves downwards and breaks contact No. 1 and 2, this in turn disconnects the line circuit. Plunger movement is restricted by a pin which engages with the detent pawl of the armature when electromagnet is not energised. This prevents the key extraction without energisation of electromagnet.
- **Switching plunger:** It is placed on RHS of the unit and is retained in upper position by a strong spring. Its insulated pin makes contact no. 3 and 4. When key is turned to RHS, plunger moves downwards thus makes contact no. 3 and 5. Now positive of the battery gets connected with line.

**Tappet Lock :** It is placed between two plungers. It ensures movement of only one plunger at a time

**Brass tumblers and Wards :** Three nos. of brass tumblers controls the movement of key. A proper combination of wards and tumblers ensures that only right key can be inserted in the transmitter

## FORCE DROP ARRANGEMENT

This arrangement is achieved by means of a "V" shaped pin fixed in locking plunger and a detent pawl (armature extension). The "V" shaped pin pushes the detent pawl when locking plunger moves downwards. As a result of this pushing, detent pawl engages with "V" shaped pin which causes the armature to drop forcefully.

## MAINTENANCE

- All working parts to be cleaned properly and shall work freely.
- All contact springs must be kept clean, with proper tension and shape.

Check key turns freely in the transmitter when the cover is correctly secured.

The key hole is such that only correct key can be inserted in each transmitter

## TESTING OF EKT

Ensure that spring contact number 3 and 5 are break (not making), if key is not turned and extracted but remaining contacts are made properly.

Ensure that the lock shape is not worn out.

Ensure that only proper key (nominated) can work.

Ensure that only one key can be extracted at a time from a pair of instrument.

Ensure that the contact springs are properly tensioned.

## MAINTENANCE SCHEDULE

Cleaning of all working parts, contact springs : **15 days**

Check that key turns freely in EKT, and the cover is properly secured and sealed. : **Weekly**

Check that EKT is properly fixed in vertical position. : **Weekly**

Check that key can not be extracted irregularly and cover can not be opened with key in condition. : **Weekly**

## DO's

Ensure that cover is properly closed and nuts are tightened.

Ensure proper sealing.

Disconnect before maintenance.

Check the insertion of wrong key.

Check the earth circuit if any.

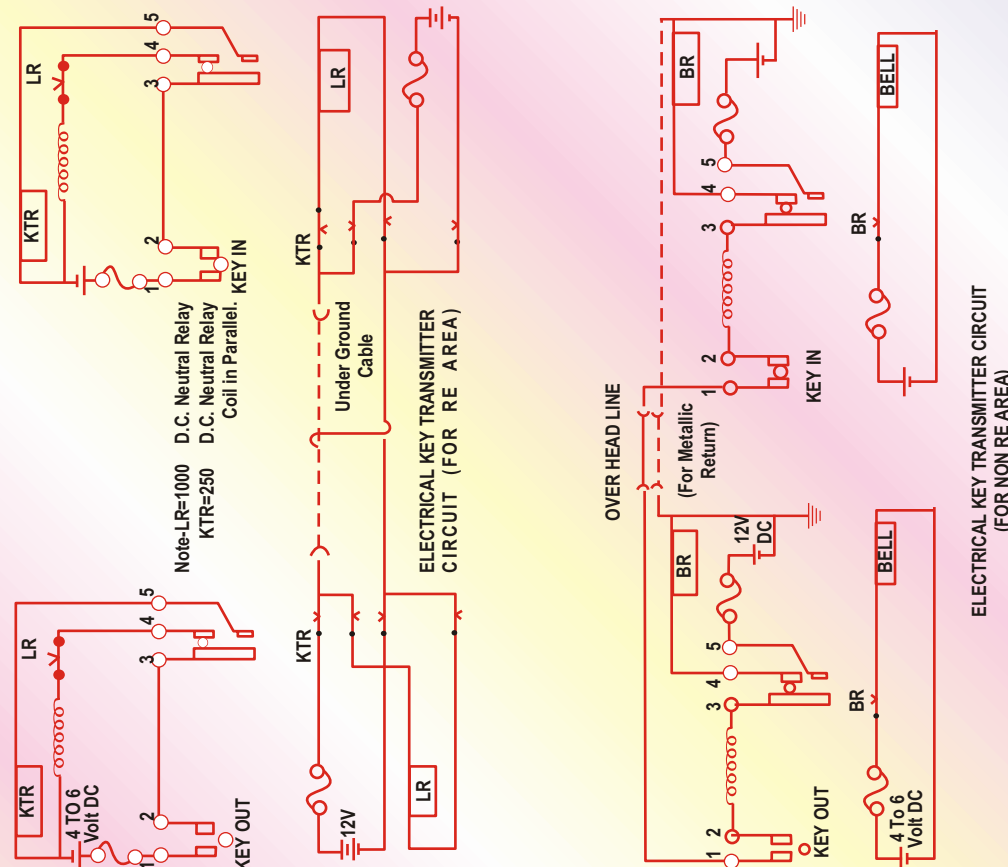
## DON'TS

Do not leave a EKT lock in which the key can be extracted without being transmitted from other end till the fault is rectified.

Allow the worn out brass tumbler.

Allow the earth resistance to be more than 10 .

Forget to seal after maintenance.



GOVERNMENT OF INDIA  
MINISTRY OF RAILWAYS

(For Official Use)

## Electrical Key Transmitter

CAMTECH/2000/S/EKT/1.0  
September' 2000

Centre  
for  
Advanced  
Maintenance  
Technology



Maharajpur, Gwalior - 474 020  
Phone & Fax : 0751-470841