

# EK6 Series Indoor High Voltage Earthing Switch

## 1 Summary

Earthing switches of series EK6 are determined for indoor installation and conform to the requirements of GB1985 and IEC 62271-102. They are fitted with snap-action operating mechanisms for positive high-speed closing and sufficiently dimensioned to conduct the rated short-circuit making current when closed under load. The speed of the snap-action closing operation is independent controls. The earthing switches are supplied as kits with a pre-assembled active part and corresponding earthing contacts supplied loose. Correct installation of these parts in a switchgear panel results in a functioning earthing switch. Routine tests to GB1985 and IEC 62271-102 are to be carried out at site accordingly.

## 2 Ambient Conditions

### 2.1 normal using ambient conditions

- (a) ambient air temperature: upper limit +40°C VIII  
lower limit – 25°C

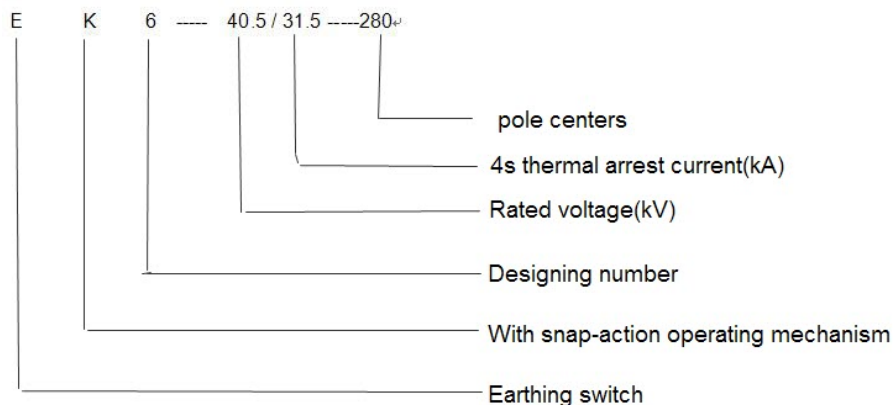
Remark: allow to store and transport under – 30°C

- (b) altitude limit: under 1000m
- (c) relative humidity: under 90%
- (d) earthquake intensity : not higher than class VIII
- (e) the place should be without fire, explode danger, serious dust, chemical corrosion and strong shock.

### 2.2 special using ambient conditions

When earthing switch is used in different places of 2.1, users will rise up special requirements to manufacturer.

## 3 product model and meaning



#### 4 Technical Parameters

Model	Rated voltage (kV)	Highest working voltage(kV)	4S rated short time withstand current(kA)	Rated peak value of current(kA)	Making current(peak value)(kA)	Pole centers (mm)	Making speed(m/s)	Main circuit contact resistance( $\mu\Omega$ )
EK6-12/31.5-210	10	12	31.5	80	80	210	> 6	< 120
Ek6-40.5/31.5-280	35	40.5	31.5	80	80	280	> 6	< 120

**Remark:** the pole centers can be changed according to customers' requirement

#### 5 Struction and Function

Earthing switches of series EK6 have three pairs of earthing blades which are located on the operating shaft and are freely movable. The pairs of earthing blades are electrically connected to each other by a short-circuiting bridge and to earth potential at the bearing brackets by two stranded copper conductors. Driver levers and toggle springs located between the bearing brackets are used to transmit the force during the switching process. Fixing the active part on a torsionally rigid switchgear panel wall or cross beam provides it with the necessary stability. The earthing contacts designed to suit the relevant switch type are to be bolted to the conductor bars supported on suitable insulating parts, e.g. pintype insulators, on the opposite side and parallel to each other, and the position adjusted until it conforms to that show in the dimensional drawings. The earthing switch has a snap action closing mechanism which functions independently of the rotation of the drive shaft. The switching speed and torque achieved in this process are independent of the actions of the operating mechanism. In the opening process, in contrast, the toggle springs have no effect on the speed of contact separation. A ring lever or suitable manual or motorized operating mechanism with the necessary torque for the type of switch and an operating angle 90° can be fitted for operation of the switch.

Note: Always open earthing switches by turning until the stop is reached.

#### 6 Working principle

When driving mechanism to close earthing switch, applied moment gets principle axis to overcome drag torque, to spur console panel to turn under the closing direction, and gets moving contact's rocker to via spring dead point, and then spring will release energy, to close earthing switch quickly. In closing position, moving contact firmly connected with fixed contact's flange part.

When opening, applied moment gets principle axis to overcome drag torque and spring power, spur console panel to turn under the opening direction, and gets moving contact's rocker to compress spring to dead point, and then spring energy storing is over, prepare for the next closing.

#### 7 Installing

When installing earthing switches in switchgear panels, following details must be taken into account if perfect switching functions etc. are to be achieved:

- The active part of the earthing switch is supplied in the open position and with pre tensioned toggle springs.
- The earthing switch can be installed in any position.
- Do not operate the switch without earthing contacts!
- Install the active part and earthing contacts without stress or distortion and parallel to each other on a torsionally rigid and flat panel wall/crossbeam and conductor bar respectively.

- Precisely maintain the spatial/dimensional position of the earthing contacts relative to the active part as shown in the dimensional drawing for the relevant switch type.
- Only use insulated mountings with a cantilever strength, cantilever insulating support should meet the requirements of GB8287.1
- Installing driving mechanism.
- The operating shaft can be moved, after two setting rings have been released. Observe the tightening torque of 4N.m for the M6 threaded pins.
- Adjust the motion sequence of the earthing blades in relation to the earthing contacts as follows:
  1. Put lubricating oil on contact area
  2. Close the switch with the fixing bolts in the earthing contacts loosely tightened.
  3. Check that the blade pairs are properly located on the contact tongues of the earthing contacts and adjust if necessary.
  4. Tighten the fixing bolts and carry out a test switching operation.
  5. Maximum permissible deviation between the central position of the earthing blades and the contact tongues of the earthing contacts:  $\leq 1$  mm for switches to drawing GCE 7005552
 Measuring Point: Clearance between the earthing blades and the contact tongues during opening. Take care when handling the switch!
- Check for unimpeded function of the high-speed switching system when the switch has been installed without stress or distortion.
- Check the tightening torque for the M 12 hexagon nut on the short-circuiting bridge, possibly removing a pair of earthing blades to provide access. This torque is important for correct function!
- Rated tightening torque:
  - without lubricant: 86 Nm
  - with oil or grease lubricated: 40 Nm.
- Bolt the copper earthing conductors to the bearing brackets and connect the other ends to the switchboard earthing bar.
- Perform at least 20 mechanical opening and closing operations on the earthing switch after completion of installation. Auxiliary switches:
- As per customers' require, it can choose to install secondary auxiliary switch, for signalling of open and closed position

## 8 Outside Shape and Installing Size Drawing

