

KS

KOREAN INDUSTRIAL STANDARD

Knife Switches with Cover

KS C 8311-1990

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1. Scope

This Korean Industrial Standard specifies front connection type knife switches with cover (hereinafter referred to as "switches"), of rated current not exceeding 100A and equipped with or without link fuses which are mainly used as the main switches, branch switches and operating switches of electric lamp, electric heating or the like, in general indoor electric circuit of frequency 60Hz and of a.c. voltage not exceeding 250V.

Remarks 1. Above-mentioned knife switch with cover means such a switch that a cover with slots through which the blades go in and come out is mounted at the front of knife switch with base (including fuse for the ones with fuse) to cover the live parts, barriers are provided between poles, and operation of switch can be done manually without opening the cover.

2. In this standard, units and numerical values in { } are based on the International System of Unit (SI) and are appended for reference.

2. Classification and Rating

The classification and rating shall be as given in Table 1.

Table 1 Classification and Rating

Classification			Rating		
Classification by single throw, double throw	Number of poles	Existence of fuse	Voltage V	Current A	Breaking current ⁽¹⁾ A
Single throw	2, 3	Yes, no	250	15	1500
				30	1500, 2500
				60 100	2500
Double throw	2, 3	No	250	15, 30, 60, 100	—

Note ⁽¹⁾ This indicates the breaking capacity of fuse [refer to KS C 0503].

Normative References :

- KS C 0503 Glossary of Terms for Fuses
- KS C 8111 Testing Methods for Wiring Devices
- KS C 8305 Plugs and Receptacles for Domestic and Similar General Use
- KS D 5201 Copper and Copper Alloy-Sheets, Plates and Strips

3. Performances

3.1 Temperature Rise

The temperature rise shall be tested in accordance with 5.2 and be not more than the value prescribed below.

The limit of reference ambient temperature shall be 40°C.

Make-break contact	50°C {K} (25°C {K})
Wire connecting terminal	50°C {K} (30°C {K})
Screw head for fuse	60°C {K}

Remark The values in parentheses shall be applied to switches without fuse.

3.2 Insulation Resistance

The insulation resistance shall be not less than 100 MΩ when tested in accordance with 5.3.

3.3 Dielectric Withstand Voltage

When the dielectric withstand voltage is tested in accordance with 5.4, the switch shall withstand 1500V for 1 min.

3.4 Making and Breaking

When the making and breaking performance is tested in accordance with 5.5, no short-circuit between poles nor other trouble detrimental to practical use shall appear.

3.5 Short-Circuit Breaking (for switches using link fuses only)

When the short-circuit breaking performance is tested in accordance with 5.6, the circuit shall be perfectly interrupted by the fuse, and the requirements prescribed below shall be satisfied.

- (1) Short-circuit between poles or earth fault shall not be caused by are.
- (2) The cover shall not cause tracking or catch fire by are.
- (3) The calico shall not be ignited by are (in this case, it shall be regarded as ignited when charred hole of 5mm or more is produced).
- (4) The cover shall not be opened.
- (5) There shall be no harmful damage to practical use on the cover, base, terminal and the like.
- (6) The link fuse shall be replaceable and make-break operation can be made.
- (7) The insulation resistance after the test shall be not less than 0.2MΩ.

3.6 Heat Proof

When the heat proof is tested in accordance with 5.7, deformation, swell, crack nor other abnormality harmful to practical use shall appear on the synthetic resin mouldings.

3.7 Heat Cycle of Terminal (when the terminals which connect aluminium wire directly)

The terminals are subjected to the heat cycle test in accordance with 5.8, the temperature rise at the end of on-current period in 150th cycle shall be not more than 50 °C {K} and the difference in temperature rise between 2 specified instants shall be not more than 8 °C {K}.

3.8 Strength of Cover

When the strength of cover is tested in accordance with 5.9(1), the cover shall not be damaged.

3.9 Strength of Terminal Part

When the strength of terminal part is tested in accordance with 5.9(2), such abnormalities as damage of the terminal or terminal screw shall not appear.

3.10 Durability of Ammonia Gas

When the durability of ammonia gas is tested in accordance with 5.10, such abnormalities as damage, crease and crack of the terminal screw and brass members shall not occur.

4. Construction, Dimensions and Materials**4.1 Construction in General**

Switches shall be robust, correct in shape and comply with the following requirements :

- (1) The construction shall ensure smooth make-break operation, perfect electric contact, easy fitting of wire and easy exchange of link fuse.
- (2) The construction shall be such that access of hand to the live part at the time of make-break operation as well as exchanging the link fuse, is not anticipated.
- (3) The cover shall be so constructed that it will not come off easily by vibration or the like.
- (4) The fuse side cover shall so constructed that the cover is coupled with base by means of hinge or the like, to allow turning of 170 degrees or more, and is easily opened without using screw driver or the like. For the switch with removable cover, however, a cover which can turn by 100 degrees or more may be used.
- (5) Switches shall be so constructed that they will not reach to the other pole, in the case of make-break operations or operation of fuse, by means of barriers provided between poles (the barriers are set in grooves of base).
- (6) Partition or the like shall be prepared so as not to stain the hinge clip when the fuses operate.
- (7) Conductive body liable to cause short-circuit by arcing shall not be located between different poles.
- (8) The construction shall be such that every pole closes and opens simultaneously, and the blade stops at the correct position of clip with an appropriate contact

pressure applied when closed.

- (9) Switches shall be so constructed that an appropriate contact pressure is applied to the contact parts of blade and hinge clip, by means of spring washers or other methods.
- (10) The clip seat, hinge clip seat and terminal seat shall be mounted in such a manner that no easy loosening nor rotation is anticipated.
- (11) The clamping screws for link fuse (hereinafter referred to as "fuse screws"), and terminal screws shall not also serve as the mounting means of other components. For such construction that the mounting of components does not become loose in the case of exchanging the wire or link fuse, however, the above requirements need not be fulfilled.
- (12) Cup washers shall be used together with the fuse. However, if the mounting of the link fuse is easy and secure, and there is no possibility to rotate the link when clamping, cup washers are not required.
- (13) Number of engaging threads of terminal screw, fuse screw, mounting screw, etc. shall be not less than 2. However, for the screw of nominal size 8mm or more, the engaged length of screw shall be not less than 40% of screw diameter.
- (14) The terminal to connect external wiring shall be as follows :
 - (a) Switches shall employ machine screws for fitting wire or the like.
 - (b) The switches of such construction that the wires are connected directly to the terminals, shall be able to connect the appropriate wire for the rated current of switch given in Table 2, easily and securely.
 - (c) For clamping the wire directly by the screw head of terminal screw, the major oval fillister head screw (head slotting may be cross recessed head.) given in Reference 1 of KS C 8305 shall be used.
 - (d) Oval fillister head screws shall be used together with spring washers as the terminal screws for terminals of such construction that the wire is connected using crimp-style terminal or the like which is clamped to the terminal by screw head.