Description of Installation switches, part 1

This document adds further information to IEC 60617 change requests C00200 - C00201 and C00203 – C00205 proposed by FI NC. Also document gives answers for questions presented by NCs during the evaluation stage.

In technical documentation physical objects like electrical components are presented in drawings and diagrams by using graphical symbols. However some graphical symbols have limitations by “application classes” which specify what document kind symbol is intended to use. Graphical symbols for the switches in installation diagrams are one example of such symbol family.

Depending on document kind the same object is sometimes presented by using different graphical symbol in a different document kind (for example symbols for switches in installation diagram and circuit diagram are different).

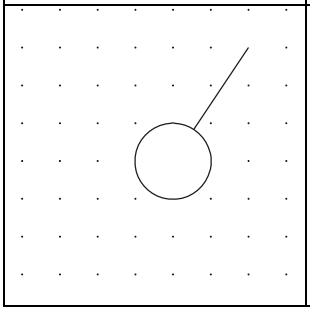
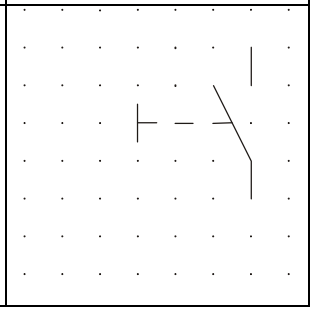
In order to understand the symbols for the switches remember that they are very old, created at a time when “all” installation switches were rotary switches. These switches had stable electrical positions.

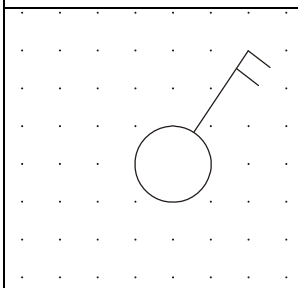
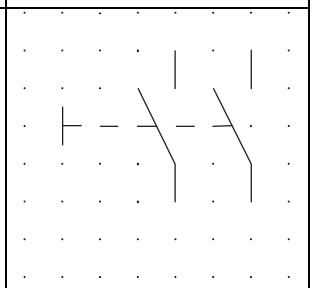
After that a switch generation was added with pushbutton operated rotary switches. The manual operating pushbutton had spring return (mechanical pulse), but the electrical position was still stable, because the switch itself (the actuator) was of rotary type.

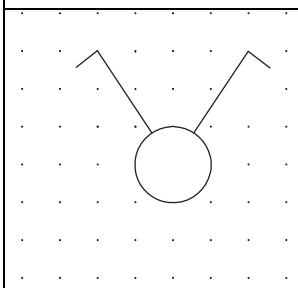
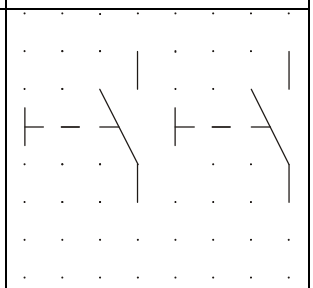
After that came the generation with lever operated bi-stable switches. The electric positions (the actuator) were stable and so was the manual operating lever. In some cases the lever could return to a middle position so in that case there was a type of pulse operation.

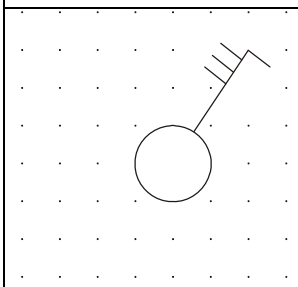
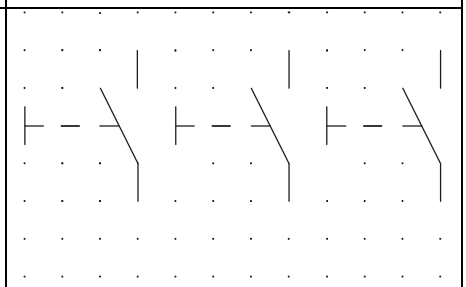
Today we have electronic switches. The actuators of those also have electrically stable positions. At voltage loss they remember their previous state and return to that when the voltage comes back. The electronic actuator is pulse controlled from the manual operating device, so that device has spring return for one or two pushbuttons. If proximity effect is used it is a kind of “virtual spring return”.

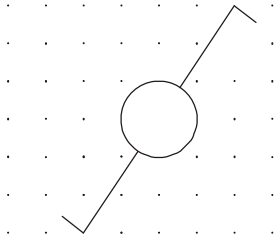
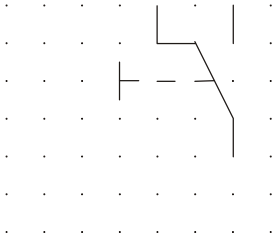
Following symbols are standardized in IEC 60617

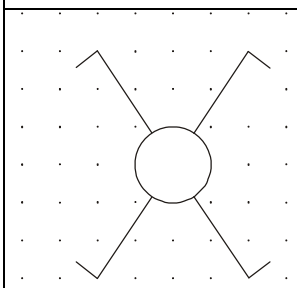
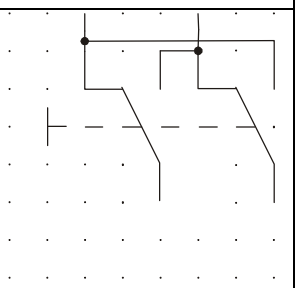
Installation diagram	Circuit diagram	Comments
Identity number: S00466	Identity number: S00253	Single pole, 0-1, two stable electrical positions, one manual control that may or may not stay in its position (it may also return to an intermediate position) Installation switches are normally bi- (or multi-) stable; also electronic ones are usually designed to memorize their state when they lose voltage supply in order to resume it when the voltage comes back.
		

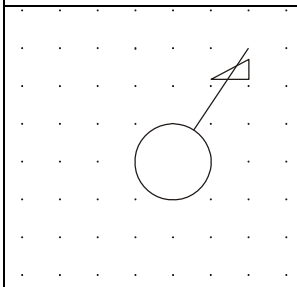
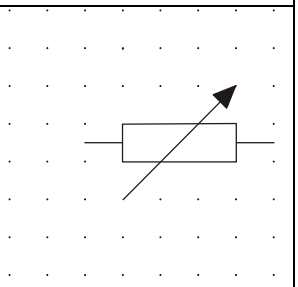
Installation diagram	Circuit diagram	Comments
Identity number: S00469	Identity number: -	Circuit diagram symbol not standardized in IEC 60617, but it can be derived using S00253. Two-pole, 1-0, two stable electrical positions, one handle that may or may not stay in its position (it may return to an intermediate one)
		

Installation diagram	Circuit diagram	Comments
Identity number: S00470	Identity number: -	Multi-position switch, single pole, 4 stable positions, one handle This is actually a “complex switch”. Originally was meant to be a rotary switch, where the rotor had 4 positions 0-1-2-(1+2)-0. It is today usually replaced by two single-pole switches or a double single pole switch with a common entry but still using this symbol. (see also description part 2)
		

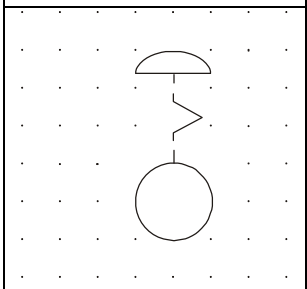
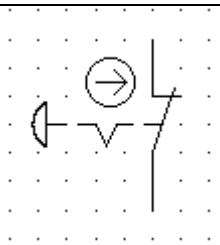
Installation diagram	Circuit diagram	Comments
Identity number: S01862	Identity number: -	S01862 Triple On-Off switch Circuit diagram symbol not standardized in IEC 60617 but it can be derived using S00253
		

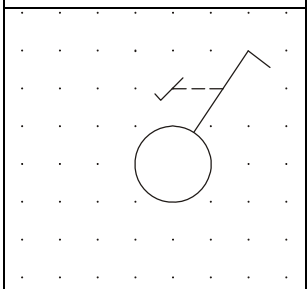
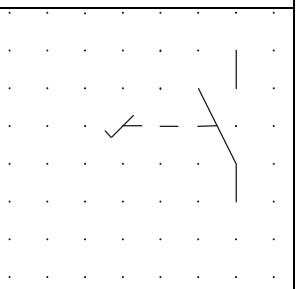
Installation diagram	Circuit diagram	Comments
Identity number: S00471	Identity number: -	Circuit diagram symbol not standardized in IEC 60617 but it can be derived using S00253 and S00230. Single-pole switch 1-2, two stable electrical positions, one handle, that may or may not stay in its position (it may return to an intermediate one). Used i.a. in stairs lighting.
		

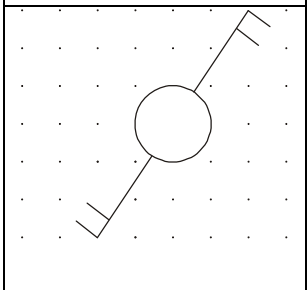
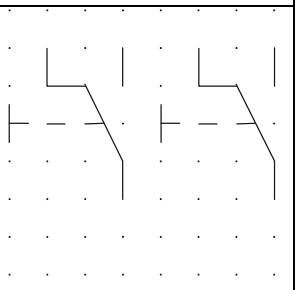
Installation diagram	Circuit diagram	Comments
Identity number: S00472	Identity number: -	Two pole, pole changing switch 1-(-1), “Intermediate switch” , one handle that may or may not stay in its position (it may return to an intermediate one). It is a duplication of the previous one, but has some additional internal connections that makes it pole changing. See A00254. It was used when more than two switches were needed for stairs lighting. Then they are put in between two switches of the previous type. That is why it got its name.
		

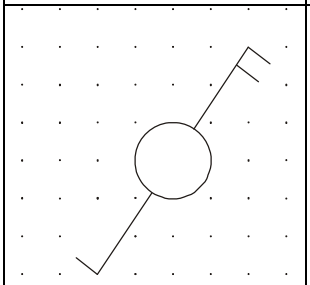
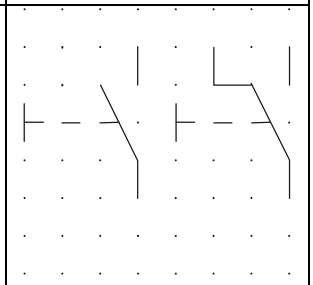
Installation diagram	Circuit diagram	Comments
Identity number: S00473	Identity number: -	S00557 Resistor, adjustable represents dimmer in circuit diagrams. Single-pole switch with dimmer, stable electrical positions continuously between 0 and 1 (see also description part 2)
		

Following symbols are under evaluation/validation stage

Installation diagram	Circuit diagram	Comments
Identity number: C00200	Identity number: S00258	C00200 Emergency switch S00258 Switch, emergency stop
		

Installation diagram	Circuit diagram	Comments
Identity number: C00201	Identity number: -	C00201 Foot switch, switch operated by foot. Note. New graphics for C00201 have been applied (see C 00207) Single pole switch, 0-1, with pedal, two stable electrical positions like other installation switches The foot pedal has spring return, but the electrical positions are stable, unless otherwise indicated.
		

Installation diagram	Circuit diagram	Comments
Identity number: C00203	Identity number: -	C00203 Double two-way single pole switch Circuit diagram symbol not standardized in IEC 60617 but it can be derived using S00253 and S00230
		

Installation diagram	Circuit diagram	Comments
Identity number: C00204	Identity number: -	C00204 Two-way single pole and single pole On-Off switch Circuit diagram symbol not standardized in IEC 60617 but it can be derived using S00253 and S00230
		

Installation diagram	Circuit diagram	Comments
Identity number: C00205	Identity number: -	C00205 Two-way single pole switch with dimmer Circuit diagram symbol not standardized in IEC 60617 but it can be derived using S00253 and S00557