

Comparison Guide UL 1054 (Special Use Switches) and UL 61058-1 (Switches for Appliances)  
 - for reference only -

This document is a brief comparison of UL 1054 to the new UL 61058-1 (4<sup>th</sup> edition). The comparison is only a high level look at the standards, and should be used to direct a more in depth review of the UL 61058-1 standard and it's effect on manufacturer's specific switch constructions.

UL 1054	UL 61058-1	Comment
1 Scope	1 Scope	UL 61058-1 has specific requirements for electronic switches (heating, endurance and abnormal). UL 61058-1 limits the switch electrical rating to 480V and 63A.
2 Glossary	3 Definitions	Similar
3 Components	24 Components for electronic switches	UL 61058-1 component requirements for impedance protection resistors, specific capacitors, protective cutouts. Effecting mostly electronic switches with specific designs.
4 General Requirements for all Switches	12 Construction 13 Mechanism	UL 61058-1 construction requirements are similar, however some of the requirements are more specific.
5 Enclosure	14 Protection against solid foreign objects, ingress of water and humid conditions	UL 61058-1 has optional IP rating requirements according to IEC 60529. UL 50 enclosure testing can also be added. UL 61058-1 requires humidity conditioning before the insulation resistance and dielectric testing sequence.
6 Thermoplastic Materials	21 Fire Hazard	UL 61058-1 requires Ball Pressure (21.1) and Glow Wire (21.2) testing, in addition to the QMFZ2 ratings for RTI and Flame. The flame ratings and RTI requirements are similar to UL 1054.
7 Nonmetallic Parts (RTI)	21.1 DV Resistance to Heat	The RTI values are very similar to UL 1054. The RTI value of critical plastic parts cannot exceed the "T" rating of the switch. UL 61058-1 evaluates both RTI (str) AND RTI (elect) according to the application.
8 Sealing Compound	9.1 Protection against Electric Shock 17.2.5.1 Endurance Test compliance	UL 61058-1 has less requirements regarding the sealing compound. Compliance is based on access to live parts and performance.
9 Live Parts	11 Terminals 19.3 Current-carrying parts	UL 61058-1 has similar requirements for current carrying parts made of copper alloy with specific constructions for stainless and steel.
9.2 Terminals and Leads	11 Terminals	UL 61058-1 has specific requirements for all types of Prepared and Unprepared terminals. The requirements are more developed but <u>do not</u> include the 30-day temperature testing.
9.3 Push-in Terminals	11.1.3 Screwless terminals for Unprepared conductors 11.2.3 Screwless terminals for prepared conductors	UL 61058-1 has specific requirements for "screwless" (push-in) terminals. Unprepared terminals require a disconnect, while Prepared terminal constructions do not require a disconnecting method.
9.4 Quick-connect terminals	11.2.5 Tabs of Flat quick-connect Terminations	UL 61058-1 has specific requirements quick-connects (push and pull tests) and allow both standard and special size Tabs. Prepared Terminal.
10 Insulation Materials	20.3 Solid Insulation	UL 61058-1 uses the term Solid Insulation as an electrical barrier only. Most Insulation Materials (switch body and parts) are evaluated under Clause 21.
11 Assembly	12 Construction 13 Mechanism 19 Screws, current-carrying parts and connections	UL 61058-1 has similar requirements for the Assembly of the switch.
11.2 Actuating members	18 Mechanical	UL 61058-1 uses Mechanical stress testing (impact, push and pull testing) to determine the ability of the switch to maintain the position of the Actuating members.

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12 Spacings	20 Clearance, Creepage distance...	UL 61058-1 has specific and smaller spacing requirements for switches. The spacings are measured both outside and inside, as well as demonstrated by dielectric testing.
13 Performance	5 General notes on tests	UL 61058-1 does not have detailed methods for combine different ratings, however it test 3 specimens instead of 6. In addition, the test sequence of UL 61058-1 is significantly different from UL 1054. The largest difference being the <u>OverVoltage</u> test replaces the Overcurrent test as the "Overload". DC switches without polarity marking, tests shall also performed at reverse polarity.
14 Testing Circuits	17 Endurance Table 15, 17, 18	The endurance test sequence is different depending on Mechanical or Electronic switch and the switch construction.
14.2 Tungsten-filament-lamp load	Annex DVB Tungsten-filament-lamp and synthetic loads	UL 61058-1 has a National Difference covering the lamp load "tungsten filament". The requirements are similar to UL 1054, although the AC inrush current has been adjusted to 10x to match most end product standards.
15.1 Mold Stress	16 Heating 17 Endurance	UL 61058-1 does NOT specifically have a Mold Stress. However for switches rated above 55°C (T55), the 16 Heating (temperature) test and half the 17 endurance cycles are completed in an oven at the maximum T rating.
15.2 Diaphragms	None	UL 61058-1 does NOT specifically have requirements for diaphragms. Although end products where the diaphragm is relied on for risk of shock or fire may additionally require the UL157 evaluation as indicated in UL 1054.
16 Overload	17.2.1.2 17.2.4.1 Increased -voltage test	UL 61058-1 uses TC1 increased voltage (115% for mechanical switches) as the "overload" test (100 cycles) in the endurance test sequence. For electronic switches TC5 "Manual functional (110%) for 20 cycles replaces the "overload" in the endurance sequence.
17 Endurance	17 Endurance	UL 61058-1 has a number of differences in the test sequence and method for cycling the switch. Speed – defined in 17.2.3 On/ off – dependent on amp rating defined in 17.2.3.4.1 Testing sequence – Mechanical 17.1.2, Electronic Table 15 Make / Break Loads – defined in Table 17 when applicable. Electronic switches are tested as complete switches and Contacts only on special specimens with the Solid State Device (SSD) shorted or disconnected.
17.1 Horsepower (hp)	Annex DVA Horsepower rated switches	UL 61058-1 located in the back of the Standard, Annex DVA indicates the testing method and conditions for the hp load.
18 Continuity	13 Mechanism	UL 61058-1 has similar methods for indicating if a switch creates a safety hazard by stopping between positions and similar Mechanism concerns.

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19 Temperature	16 Heating (pre-endurance) 17.2.5.2 (post endurance)  30K (30°C rise) - or - 55K (55°C rise)	UL 61058-1 completes a pre-endurance Heating test to determine the working temperature of the plastics for Ball Pressure (Resistance to Heat 21.1) testing and basic functionality of the switch (45K terminal rise). Pre-endurance Heating testing is completed in an oven according to the switch T rating.  UL 61058-1 also completes a post endurance Heating test on the terminals to determine the derogation of the switches ability to control the load. The manufacturer can select 30K, 55K temperature rise according to his buyers needs. 30K rise on the terminals is the limit for North American legacy standards. 55K rise on the terminals is the limit for many UL/IEC harmonized standards. (30K can be used for all standards).
20 Dielectric Voltage-Withstand	15 Insulation Resistance and Dielectric Strength	UL 61058-1 completes the Insulation Resistance test after humidity during the pre-endurance testing.  UL 61058-1 completes the dielectric testing pre-endurance (after the humidity chamber) and post endurance (at 75% of original voltage).  The voltages are determined by Table 12, and the insulation level needed (functional, basic or reinforced). In most cases testing for reinforced between live parts and the user or switch body provides the greatest use of the switch.  Dielectric Voltage-Withstand Tests is also necessary for Switch disconnection (Full, Micro, Electronic).
21 Limited Short Circuit (Mercury contacts)	23.1.1.1 Abnormal Operation electronic switches (cord and independently mounted switches)	UL 61058-1 does not have provisions for the old style mercury contacts. Specific constructions of Electronic switches may require the load side to be shorted during 23 Abnormal testing.
22.1 Pull Test (push-in terminal)	11.1.3 Screwless Unprepared 11.2.3 Screwless prepared	UL 61058-1 has specific tests including Pull testing for “push-in” terminals; in general this is determined by the conductor size.
22.2 Quick-connects	11.2.5 Tabs of flat quick-connect terminations	UL 61058-1 has specific tests including Pull/Push testing for Tabs; in general this is determined by the Tab size.
23 Effects of Heat on Actuating Members	17 Endurance	UL 61058-1 evaluates the effect of heat during the endurance cycling testing, since the first half of the cycles are completed in an oven (when rated over T55). No additional test is required.
24, 25, 26 Ratings/Marking	7 Classification and Declaration 8 Marking and documentation	UL 61058-1 has specific marking and declaration requirements. However the markings required to be placed on the switch are similar to UL 1054, the others are made via documentation. In addition, the types of electrical loads has been expanded (European and North American) including the following: 7.1.2 Loads <b>R</b> = Resistive, PF not less than 0.9, <b>RM</b> = Resistive or motor or combination, PF not less than 0.6, <b>RC</b> = combination of Resistive and Capacitive AC, <b>L</b> = Tungsten filament lamp, <b>Spc</b> = Declared specific load, <b>mA</b> = Current not exceeding 20mA, <b>SpcL</b> = Specific lamp, <b>I</b> = Inductive, PF not less than 0.6, <b>SpcM</b> = specific motor with locked rotor, PF not less than 0.6, <b>e</b> = minimum load for electronic sw, <b>TV</b> = Television (Lamp), <b>GP</b> = General Purpose, PF not less than 0.75 or more than 0.8, <b>GP-M</b> = GP or Motor (PF not less than 0.6) or combination, <b>GP-hp</b> = GP or hp (PF not less than 0.4) or combination  Marking legible and durable test is required for printed marking
27 Heater Switches	None	UL 61058-1 does not have additional requirements for the old heater switch.

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28 – 37 Television Switches	Annex DVC Television Switches	UL 61058-1 has a National Difference covering the TV rated switches (DVC). The requirements are similar to UL 1054, although the lamp loads are 10x inrush and the “overload” is an overVoltage load.
	25 EMC	UL 61058-1 has a National Difference indicating that EMC is completed as part of the end product evaluation since most electronic switches are very dependent on the supply and specific load.

Any questions or comments should be directed to your local UL office or to [ian.mcdonald@us.ul.com](mailto:ian.mcdonald@us.ul.com).