



Korry

Illuminating. Always.



Chromalux® 433

Korry 1-inch LED switches

This technical guide addresses specifications and part-number selection for Korry Chromalux 433 LED and incandescent switch lights, as well as how to retrofit them from incandescent to LED lighting. A modular design makes them very simple to install, maintain, spare, and retrofit. They are installed as original equipment on the Boeing 737, 747, 757, 767, and MD-90 and other commercial aircraft.

The Chromalux 433 is one of the highest performing products of their type, with the lowest service costs

in the industry. LED legends are uniformly bright and sunlight readable with surface temperature and power dissipation as much as 50 percent lower than the incandescent versions.

Due to the modularity of the Chromalux 433, LED lighting may be easily retrofitted into existing incandescent installations. Aircraft operators who prefer to keep using incandescent units may still order them as an option, as well as separate incandescent cap modules.



Modular Chromalux 433 switch with LED legend for long life and lower servicing costs

The Chromalux 433 1-inch switch (433-6000 series) features high-performance LED lighting for bright and uniform lighting without incandescent lamps that need replacement. The incandescent version

(433-4000 series) is still available as an option. The 433 has long been standard equipment on Boeing 737, 747-400, 757, 767, and MD-90 aircraft. The LED version is shown here.

Sunlight-readable LED lighting

Periodic lamp replacement is no longer necessary. An array of LEDs is housed in the solid, one-piece module.

Bail for foolproof switch replacement

Wire bail lets you pull the switch assembly from the housing and maintains correct cap orientation for replacement.

Color-coded master module

For confusion-free maintenance, every master module is color coded for momentary, alternate, and first-actuation lock-out configurations. Module houses contacts, actuator, and subminiature switches.

Line-replaceable cap module

Positive snap-in connection holds cap securely to the base, yet makes it easy to remove and replace.

Secure housing assembly

Terminal module (right) and mounting sleeve (far right) hold housing and wiring in place with built-in detents when the switch assembly is withdrawn. Rugged stainless-steel construction means you virtually never replace the housing.

Poke-home connection

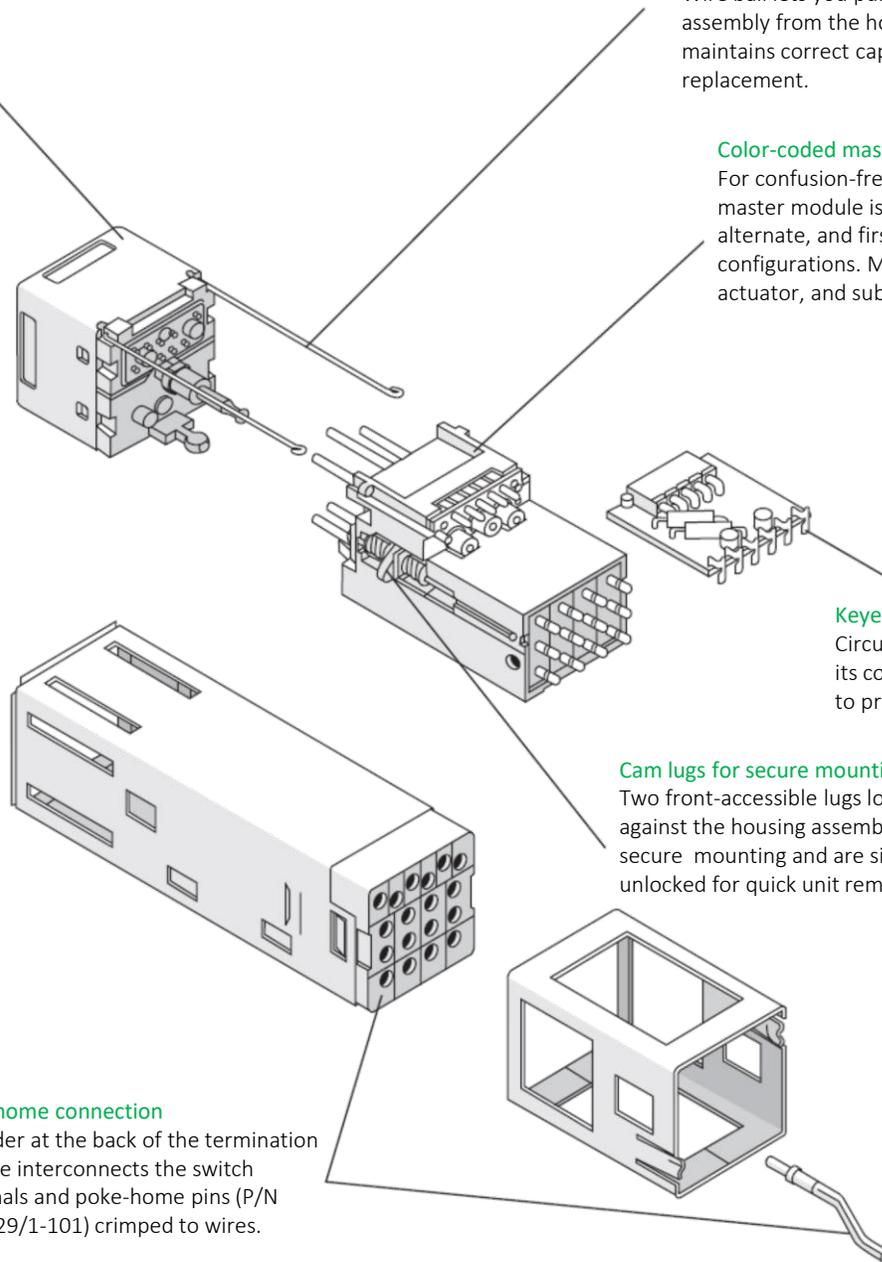
A header at the back of the termination module interconnects the switch terminals and poke-home pins (P/N M39029/1-101) crimped to wires.

Cam lugs for secure mounting

Two front-accessible lugs lock against the housing assembly for secure mounting and are simply unlocked for quick unit removal.

Keyed circuit module

Circuit module can plug only into its corresponding master module, to prevent mismatch.



Lighting

The Chromalux 433-6000 series is illuminated with LED arrays. For customers who prefer the incandescent version with four lamps per cap, the 433-4000 series is still available. Additional information on lighting performance and information on how to upgrade to LED illumination is shown later in this brochure.



The advantages of LED lighting

LED lighting is standard for Chromalux 433 switch lights, but incandescent versions are still available. Both lighting types are sunlight readable and available in the five standard aviation colors: green, amber, red, blue, and white. The LEDs, however, offer significant performance and cost advantages, and it's easy to upgrade existing incandescent units to LED lighting, thanks to Korrry's drop-in retrofit capability

Life-of-the-aircraft longevity

LED illumination has a life greater than 60,000 hours versus 10,000 hours for incandescent.

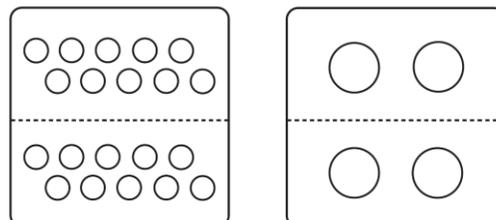
Lower maintenance costs

By never having to replace lamps, you save continually on lamp inventory, labor, and avoided lamp-failure AOGs.

Reduced power consumption and surface temperature

LEDs reduce power consumption by as much as 50 percent and also lower the touch temperature of the display face.

434 LED versus incandescent



Improved legend uniformity

LED arrays provide more light sources than incandescent lamps. Color and brightness are more uniform.

Lighting Specifications

Brightness	Voltage	Brightness
	VDC	FtL*
RED	12.0 ± 0.3	5.0-10.0
	26.5 ± 0.3	200-400
AMBER	12.0 ± 0.3	7.0-14.0
	26.5 ± 0.3	300-600
GREEN	12.0 ± 0.3	5.0-10.0
	26.5 ± 0.3	200-400
WHITE	12.0 ± 0.3	5.0-10.0
	26.5 ± 0.3	200-400
WHITE SHUTTER	5.0 ± 0.3 VAC	2.0-4.0
		400Hz

* The range given is for an overall legend average of separate readings from every character. The ratio between character readings does not exceed 2:1.

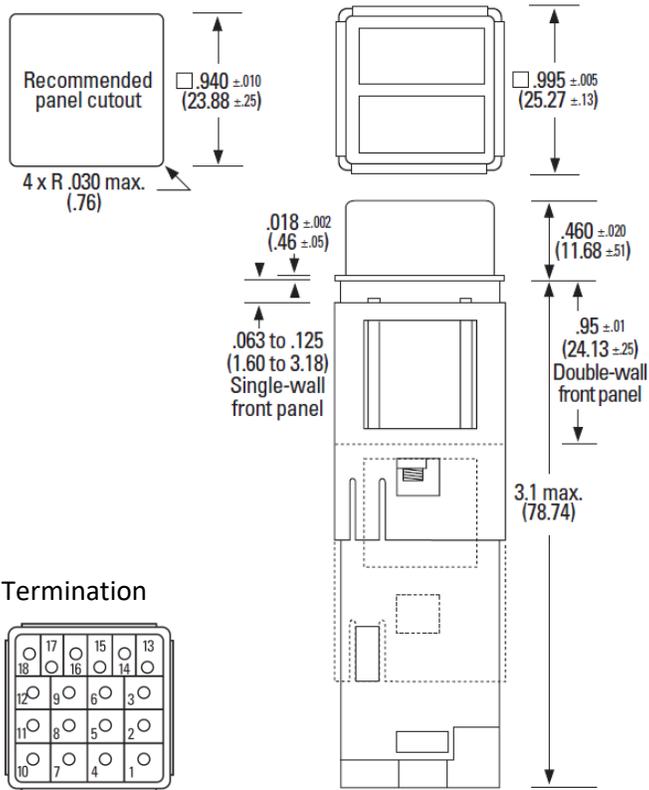
Chromaticity	Voltage	Chromaticity*	
	VDC	X	Y
RED	26.5 ± 0.3	0.670	0.330
		0.710	0.290
		0.670	0.310
		0.695	0.285
AMBER	26.5 ± 0.3	0.570	0.430
		0.605	0.395
		0.562	0.415
		0.596	0.382
GREEN	26.5 ± 0.3	0.402	0.597
		0.455	0.545
		0.436	0.515
		0.385	0.566
WHITE	26.5 ± 0.3	0.421	0.441
		0.468	0.454
		0.409	0.408
		0.453	0.420
WHITE SHUTTER	5.0 ± 0.3 VAC	0.508	0.425
		0.545	0.421
		0.494	0.405
		0.529	0.401

* CIE color coordinates for the legend fall within the defined area.

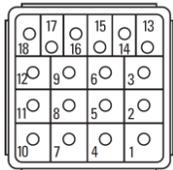


Mechanical

Note: dimensions in inches (mm).



Termination



Mounting sleeve

Standard sleeve mounts unit to single- or double-wall panels.

Materials

Cap: molded thermoplastic
Housing assembly: stainless steel

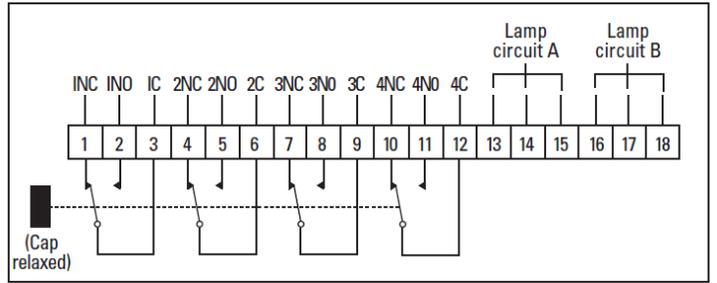
Operating Characteristics

Switch travel	0.37 inch
Actuation force	48-80 ounces
Cap extraction force	3.7-7.0 pounds
Mechanical life	120,000 cycles
Switch contact ratings	7 Amperes at 28 VDC
Lamp circuit voltages	
Switch position (shutter)	5 VAC
Status/Caution	28 VDC

Legend

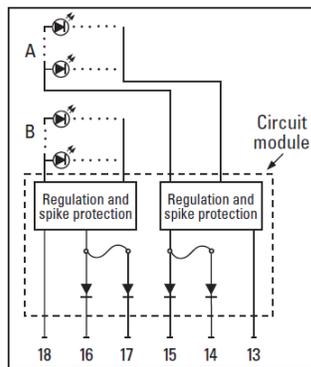
Display type	
Switch position	shutter legend
Status/Caution	fixed legend
Typeface	0.125-inch Futura Medium, unless otherwise specified

Switch Circuits

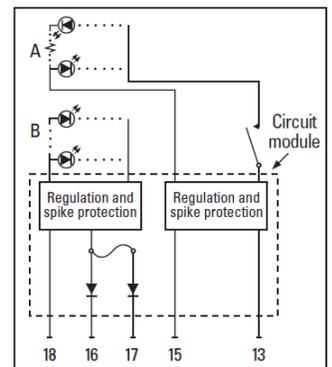


Lamp Circuits

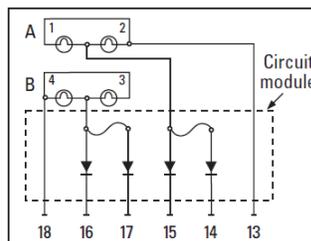
Type I/II (LED arrays)



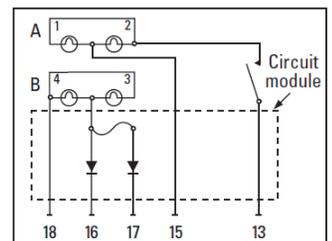
Type I/III (LED arrays)



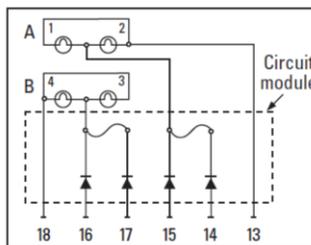
Type I/I (incandescent)



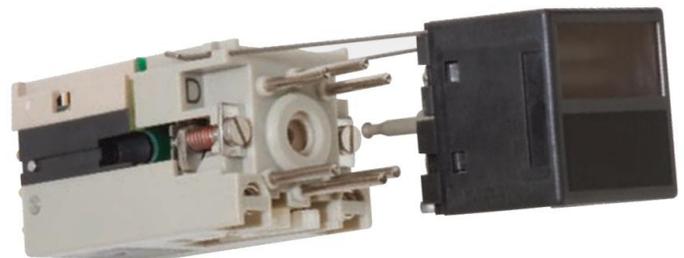
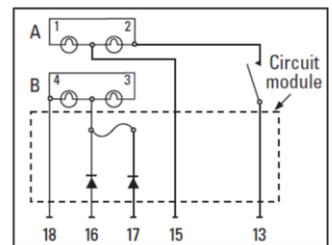
Type I/III (incandescent)



Type II/II (incandescent)



Type II/III (incandescent)



How to find the right 433 part number

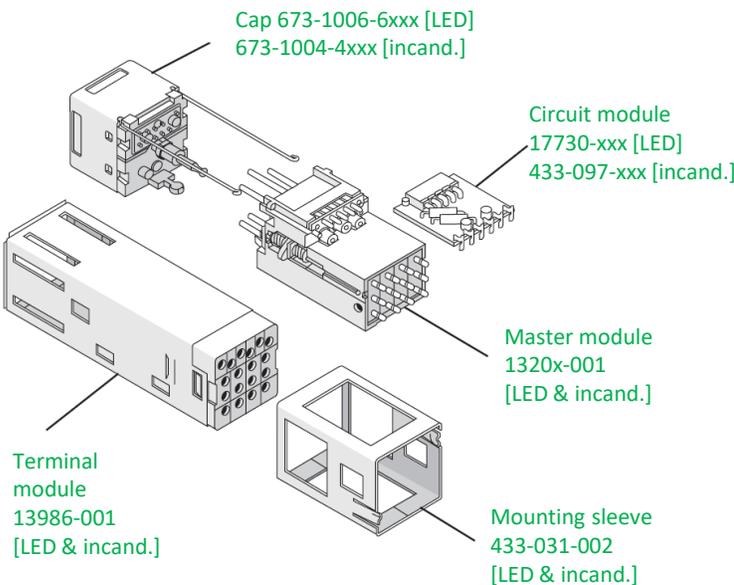
Complete assembly

The complete Chromalux 433-6000 assembly has Korry P/N 433-673-1006-6xxx, where -6xxx is identical to the Boeing dash number (Boeing P/N S231T290-6xxx).

The complete Chromalux 433-4000 assembly has Korry P/N 433-673-1004-4xxx, where -4xxx is identical to the Boeing dash number (Boeing P/N S231T290-4xxx).

The complete Chromalux 433-1000 assembly has Korry P/N 433-673-1001-1xxx, where -1xxx is identical to the Boeing dash number (Boeing P/N S231T290-1xxx).

For a given configuration, the last three digits of the 433-6000, 433-4000, and 433-1000 dash numbers are identical. Every 433-1000 or 433-4000 unit is one-way upgradeable to a 433-6000 with the same final three digits in the dash number.



Example: P/N 433-673-1006-6028 (Boeing P/N S231T290-6028) matches the configuration of P/N 433-673-1004-4028 (Boeing P/N S231T290-4028) and of P/N 433-673-1001-1028 (Boeing P/N S231T290-1028).

Circuit module

For the correspondence between circuit type and master module P/N, see the master module table (right). Matching circuit and master modules are keyed to prevent mix-up.

Circuit type	LED P/N	Incand. P/N
I/II	17730-002	433-097-001
II/II	N/A	433-097-002
I/III	17730-001	433-097-003
II/III	N/A	433-097-006

Cap

433-6000 series caps have P/N 673-1006-6xxx (just delete the initial 433- from the complete assembly P/N). For a given configuration, the -6xxx dash numbers of the cap and complete assembly are identical.

Master module

Current 433-6000 and 433-4000 series master modules are identical and have P/N 1320x-001 and 17675-001. Older series 433-1000 and 433-4000 master modules have P/N 433-092-xxx. The following table shows the correspondence. To replace a dash number in a left-hand column, use the current P/N at the far right.

Circuit type	Switch Action	Master Module P/N					Color Coding	
		Old P/N Current P/N			Current P/N			
I/II	ALT	-001	-019	-028	-025	-034	13205-001	Brown
I/III	ALT	-002	-020	-029	-023	-032	13206-001	White
I/I	MOM	-003	-021	-030	-026	-035	13203-001	Green
II/III	ALT	-004	-022	-031	-024	-033	13204-001	White
I/I	MOM/LO	****	-003	-003	-027	-027	13202-001	Red
II/II	MOM	N/A	N/A	N/A	N/A	N/A	17675-001	Green+
Mfr. date		5/82 – 10/86	10/86 – 3/88	3/88 – 10/88	9/87 – 3/88	3/88 – current	current	
Series		1000	1000 green dot	1000A	4000	4000A B & C	6000	

The ring of the actuator on the face of the master module is color coded: alternate action (white), momentary (green), momentary with first-push lock-out (red). The lock-out feature is designed to prevent unintentional activation of critical systems (i.e. RAM AIR TURBINE or FIRE BOTTLE) in case the switch is relamped with power on. The switch will transfer only on the second actuation.

Housing assembly

Series 433-6000 and 433-4000 housing assemblies are identical and consist of a terminal module (P/N 13986-001) and a mounting sleeve (P/N 433-031-002). If necessary, any housing assembly part for the older -1000 series can be replaced with a current -4000 part.

Boeing dash no.	Description	Korry P/N
-821	Standard	433-100-002
-822	Lockwire	433-100-003
-823	45° rib	433-100-004
-824	Double	433-100-005
-825	45° rib & lockwire	433-100-006
-826	Standard with red border	433-100-007



Retrofitting LED lighting into incandescent units

A simple drop-in retrofit lets you upgrade incandescent Chromalux 433 switches to LED lighting. Power conditioning and dimming functions are integrated into the switch and indicator modules, so there's no need to modify aircraft power or wiring.

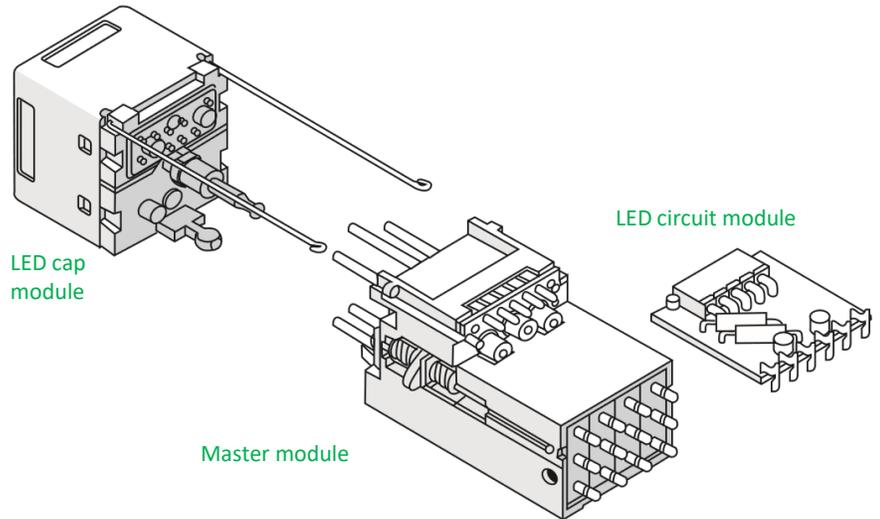
An LED retrofit involves either replacing the switch assembly or swapping out the cap and circuit modules. Both are line maintenance procedures that do not affect the existing housing assembly attached to the front panel. Consult the CMM for specific instructions.

Swapping out the cap and circuit modules requires more time than replacing the entire switch assembly, but allows you to keep the existing master module.

For details on ordering the correct part numbers, see the 433 part numbering guide on the previous pages.

Chromalux 433 switch assembly

All three subassemblies of the LED version have the same form and fit as the incandescent version, allowing for simple drop-in retrofit.



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The information and data given are typical for the equipment described. However, any individual item is subject to change without any notice