

3 PUSHBUTTON SWITCHES

General Purpose Illuminated Pushbutton Switches

Eaton offers a wide range of pushbutton switches for standard industry applications such as appliances, electronics, medical and test instrumentation, office equipment and many other commercial applications. A variety of options are available such as illuminated and non-illuminated versions, colored lens caps, lamp

styles, and mounting styles. Each pushbutton series offers a matching indicator for a consistent look. See the reference table below to quickly identify the required product. Then, refer to the selection table to determine the catalog number.

095 Series





Options:

- T-1 lamps.
- Special dead front and sunlight readable lenses legends.
- Split legend lenses.
- Military Snap-Switch, MS 8805.

Selection Tables

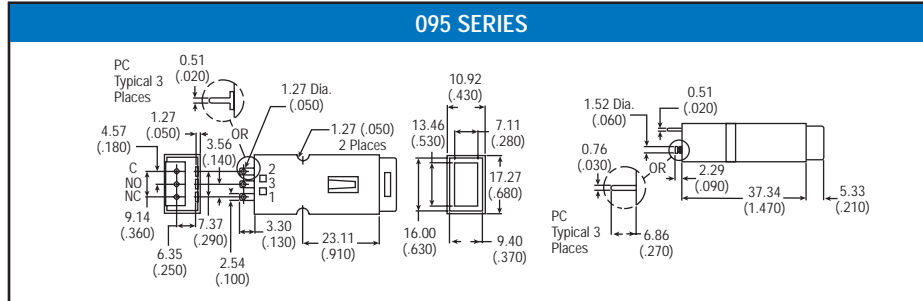
See pages 3.8 and 3.9.

ILLUMINATED AND NON-ILLUMINATED PUSHBUTTONS AND INDICATORS REFERENCE TABLE

SERIES	095/099	206/208	220/221/224	231/234	580/581/586
Selection Table	Page 3.8	Page 3.8	Page 3.8	Page 3.8	Page 3.9
Ratings	7A @ 28V dc, Resistive 4A @ 28V dc, Inductive Silver Contacts	Silver Contacts: 5A @ 125V ac or 250V ac Gold Contacts: 0.1A @ 125V ac/dc	Silver Contacts: 5A @ 125V ac or 250V dc Gold Contacts: 0.1A @ 125V ac/dc	Silver Contacts: 5A @ 125V ac or 250V ac Gold Contacts: 0.1A @ 125V ac/dc	Silver or Gold plated contacts: 1A @ 125V ac Gold plated contacts for low level
Action	Momentary	Momentary Alternate with positive latch down	Momentary Alternate with positive latch down	Momentary Alternate with positive latch down	Momentary Alternate with positive latch down
Switch Circuitry	Snap Action 1PDT	Break before make 1PDT or 2PDT 2 independent lamp circuits	Break before make 1PDT or 2PDT	Break before make 1PDT or 2PDT	Double Break 1PST or 2PST
Termination Types	Solder lug and solder turret Printed circuit board terminations Gold plated brass	0.51 x 2.79mm (.020 x .110")	0.51 x 2.79mm (.020 x .110")	0.51 x 2.79mm (.020 x .110")	0.31 x 2.79mm (.012 x .110")
Pushbuttons	9.53 x 16.15mm (.375 x .636") with 7.09 x 13.46mm (.279 x .530") legend area	15.87 x 25.40mm (.625 x 1.000") rectangular Full or horizontal split lens Plain, engraved, or hot stamped	15.87mm (.625") square Plain, engraved, or hot stamped	15.87mm (.625") square Plain, engraved, or hot stamped	12.70mm (.500") square 3 heights above panel Plain, engraved, or hot stamped
Mounting	Rail Mounting	Snap-in panel mounting Stainless steel retaining clips 0.76 to 4.76mm (.030 to .188") Panel Thickness Barrier mount available	Snap-in panel mounting Stainless steel retaining clips 0.76 to 4.76mm (.030 to .188") Panel Thickness Barrier mount available	Snap-in panel mounting Stainless steel retaining clips 0.76 to 4.76mm (.030 to .188") Panel Thickness Barrier mount available	Snap-in panel mounting Choice of two bezel styles: Chamfered or Flat Stainless steel retaining clips 1.59 to 4.76mm (.063 to .188") Panel Thickness
Lamps	One or two T-1 3/4 flange base Incandescent or LED Front relampable: lamp capsule hinges down for easy relamping	Two T-1 3/4 wedge base lamps Incandescent Front relampable Lamp stationary to reduce mechanical shock to filament	One T-1 3/4 wedge base Incandescent Front relampable Lamp stationary to reduce mechanical shock to filament	One rectangular LED flush with cap Various voltages available Diode protection available	One T-1 3/4 wedge base Incandescent Front relampable Lamp stationary to reduce mechanical shock to filament
Pushbutton Travel	.060" nominal	2.29 (.190")	2.29 (.190")	2.29 (.190")	4.32 (.170")
Approvals		UL Recognized CSA Certified 	UL Recognized CSA Certified 	UL Recognized CSA Certified 	UL Recognized CSA Certified 
Circuit Diagram Letter See Page 4.28	K, P	K, N	K, N	K, N	J, L, M

① Terminations suitable for solder or female 110 connectors. Series 770: solder only.
 ② See page 3.13 for more information.
 ③ See selection table.
 ④ See page 3.13 for more information.
 ⑤ Silver switches only.
 ⑥ Meets solderability requirements of MIL-STD-202 Method 208.

DIMENSIONS APPROXIMATE IN MM (INCHES)



Dimensions continue on [page 3.10](#).

ILLUMINATED AND NON-ILLUMINATED PUSHBUTTONS REFERENCE TABLE (continued)

	770/775	810/815	820/825	860/861/845
	Page 3.9	Page 3.9	Page 3.9	Page 3.9
	Silver Contacts: 10.5A @ 125V ac or 250V ac Gold Contacts: 0.25A @ 125V ac or 30V dc	Silver Contacts: 3A @ 125V ac or 250V ac Gold Contacts: 0.25A @ 125V ac or 30V dc	Silver Contacts: 3A @ 125V ac or 250V ac Gold Contacts: 0.25A @ 125V ac or 30V dc	Silver Contacts: 6A @ 125V ac or 3A @ 250V ac Gold Contacts: 0.25A @ 125V ac or 30V dc
	Momentary Alternate with positive latch down	Momentary Alternate with positive latch down	Momentary Alternate with positive latch down	Momentary Alternate with positive latch down
	1PDT or 2PDT (2 circuit) 2 independent lamp circuits	Break before make 1PDT or 2PDT	Break before make 1PDT or 2PDT	Double Break 1PST or 2PST, N.O.
	0.51 x 3.18mm (.020 x .125") ① Epoxy Sealed	0.64 x 2.79mm (.025 x .110") ① Epoxy Sealed	0.64 x 2.79mm (.025 x .110") ① Epoxy Sealed	0.64 x 2.79mm (.025 x .110") ①
	18.54 x 24.64mm (.730 x .970") rectangular Plain, engraved, or hot stamped ②	19.05 x 25.40mm (.750 x 1") rectangular 2 heights above panel ③ 5 styles Plain, engraved, or hot stamped	19.05mm (.750") square 2 heights above panel ③ 5 styles Plain, engraved, or hot stamped	15.87mm (.625") square Horizontal split legend (indicator only) 3 heights above bezel ③ 5 styles Plain, engraved, or hot stamped
	Panel mounting retained by molded sleeve and nut May be individually mounted or gang mounted in horizontal or vertical rows Panel Thickness from .76 to 6.35mm (.030 to .250") Barrier mount available ④ Snap mount available	Snap-in panel mounting Stainless steel retaining clips 1.59 to 4.76mm (.063 to .188") Panel Thickness Barrier mount available ④	Snap-in panel mounting Stainless steel retaining clips 1.59 to 4.76mm (.063 to .188") Panel Thickness Barrier mount available ④	Snap-in panel mounting Stainless steel retaining clips 1.59 to 4.76mm (.063 to .188") Panel Thickness Barrier mount available ④
	Accepts two T-1 3/4 midjet flange base lamps Incandescent or neon Front relampable	One T-1 3/4 Bi pin base Incandescent, Neon or LED Front relampable Lamp stationary to reduce mechanical shock to filament	One T-1 3/4 Bi pin base Incandescent, Neon or LED Front relampable Lamp stationary to reduce mechanical shock to filament	One T-1 3/4 Bi pin base Incandescent, Neon or LED Front relampable Lamp stationary to reduce mechanical shock to filament
	5.59 (.220")	5.59 (.220")	5.59 (.220")	5.59 (.220")
	UL Recognized ⑤ CSA Certified ⑤ 	UL Recognized ⑤ CSA Certified ⑤ 	UL Recognized ⑤ CSA Certified ⑤ 	UL Recognized ⑤ CSA Certified ⑤
	Q	K, N	K, N	J, L



095 Series
Avionics Switch



581K11510
Blue Full Lens



206K11810M0203
Split Green/Red Lens



231K11810
LED Display

HOW TO ORDER — ILLUMINATED PUSHBUTTONS

To determine your **Complete Catalog Number**, you must start with the appropriate **Base Prefix Number** and add the appropriate **Code Letters and/or Numbers** as in the example below:

Add each appropriate Number or Letter...												...to get to your Complete Catalog Number
Base Prefix	Product Type	Action	Number of Poles	Contact Material	Terms. Type	Mounting	P.B. Style	Top Lens Color	Bottom Lens Color	P.B. Height	Lamp	Complete Catalog Number
810	K	1	1	8	1	1	M	05	—	A	02	810K11811M05A02
815	L	—	—	—	1	1	T	03	—	A	02	815L11T03A02

ILLUMINATED PUSHBUTTONS SELECTION TABLE

LETTERS AND NUMBERS — ADD TO BASE PREFIX NUMBER																								
Switch Series	Product Type	Action	No. of Poles	Contact	Terminations	Mounting ②	P.B. Style	Full/Top Lens	Bottom Lens	P.B. Height	Lamp													
770 ③	Switch	K	Mom.	1	1 P.D.T.	1	Silver	8	Solder	1	No Barriers	0	Matte	M	Orange	00	Orange	00	9.1mm (.360") Full	F	Use two digit item number from bulb chart (Accepts 2 bulbs) Chart II, V on page 3.12			
				2	2 P.D.T.	2	Gold	9								01		White	01	6.9mm (.270") Full		G		
			Alt.	1	1 P.D.T.	1	Silver	8								1		Green	03	Green		03	3.0mm (.120") Full	H
				2	2 P.D.T.	2	Gold	9																
			03	Green	03	3.0mm (.120") Full	H																	
04	Yellow	04	3.0mm (.120") Full	H																				
05	Blue	05	3.0mm (.120") Full	H																				
775 ③	Indicator	L	NA	NA	NA	NA	NA	NA	NA	9.1mm (.360") Split	S	NA												
860 (Non-illuminated) 861 (Illuminated)	Switch	K	Mom.	1	1 P.D.T.	1	Silver	8	Solder	1	Vertical Barriers	0	Clear	C	Orange	00	Orange	00	6.1mm (.240")	A	Use two digit item number from bulb chart Chart III on page 3.12			
2				2 P.S.T.	3	Gold	9	01											White	01		8.9mm (.350")	B	
845	Indicator	L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA			
																						2	2 P.S.T.	3
810	Switch	K	Mom.	1	1 P.D.T.	1	Silver	8	Solder	1	Vertical Barriers	0	Dead-front	D	Orange	00	Orange	00	8.4mm (.330")	A	Use two digit item number from bulb chart Chart I, VII on pages 3.12 & 3.13			
				2	2 P.D.T.	2	Gold	9														01	White	01
815	Indicator	L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Filtered	F	White	01	White	01	11.2mm (.440")	B				
																					2	2 P.D.T.	2	Gold
820	Switch	K	Mom.	1	1 P.D.T.	1	Silver	8	Solder	1	Vertical Barriers	0	Matte	M	Green	03	Green	03	8.4mm (.330")	A	Use two digit item number from bulb chart Chart I, IV, VII on pages 3.12 & 3.13			
				2	2 P.D.T. NC	2	Gold	9														04	Yellow	04
825	Indicator	L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Trans-lucent	T	Blue	05	Blue	05	11.2mm (.440")	B				
																					2	2 P.D.T. NC	2	Gold
580 (Non-illuminated) 581 (Illuminated)	Switch	K	Mom.	1	1 P.S.T. NO	1	Silver Plate	5	Solder	1	Chamfered Bezel	0	Matte	M	Lunar White	12	Lunar White	12	11.2mm (.440")	B	Use two digit item number from bulb chart Chart III on page 3.12			
				2	2 P.S.T. NC	2	Gold Plate	9														03	Green	03
586	Indicator	L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Trans-lucent	T	Clear	15	Clear	15	11.2mm (.440")	C				
																					2	2 P.S.T. NC	2	Gold Plate
586	Indicator	L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Black ③	21	Gray	20	Gray	20	11.2mm (.440")	C				
																					2	2 P.S.T. NO/NC	2	Gold Plate

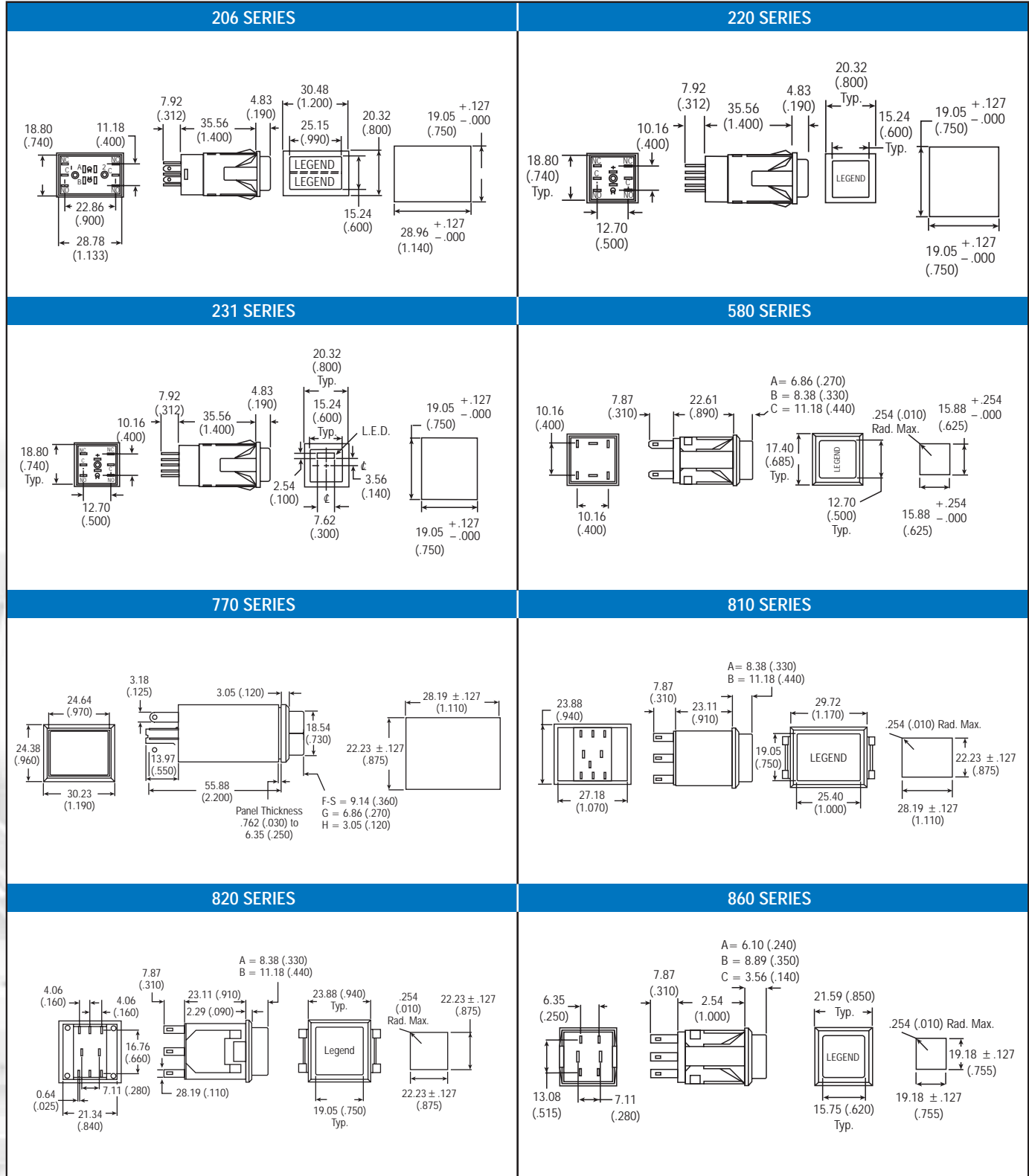
① Pole one is Silver. Pole two is Gold.
 ② Flush with bezel.
 ③ Not available with lighted display.

④ Not available with lighted display. Available only on "M."
 ⑤ Full or Split style caps available.

3 PUSHBUTTON SWITCHES

General Purpose Illuminated Pushbutton Switches (continued)

DIMENSIONS APPROXIMATE IN MM (INCHES)





HOW TO ORDER — ILLUMINATED AND NON-ILLUMINATED PUSHBUTTON CAPS

To determine your **Complete Catalog Number**, you must start with the appropriate **Base Prefix Number** and add the appropriate **Code Letters and/or Numbers** as in the example below:

Add each appropriate Number or Letter...						...to get your Complete Catalog Number
Base Prefix	Product Type	Display Legend/Style	Lens Color Full/Top	Lens Color Bottom	Cap Height	Complete Catalog Number
220	P	D	05	—	A	220PD05A
580	P	T	02	03	A	580PT0203A

ILLUMINATED AND NON-ILLUMINATED PUSHBUTTON CAPS SELECTION TABLE

3

SERIES NUMBER	PRODUCT TYPE	DISPLAY LEGEND/STYLE	LENS COLOR — FULL/TOP	LENS COLOR — BOTTOM ❶	CAP HEIGHT ❶										
2 Lamp display on Series 206 and 208 Non-Illuminated Series 220 and Illuminated 221, 224 and 225 LED display on Series 231 and 234	Pushbutton	P	Matte — No Insert Transmitted Color Clear Cap and Color Insert — Transmitted Color Deadfront — Smoky Gray Cap and Color Insert Filtered Color — White Cap and Color Insert	M C D F ❸	Orange 00 White 01 Red 02 Green 03 Yellow 04 Blue 05 Amber 10 Lunar White 12 Light Green 13 Clear 15 Gray ❷ 20 Black ❷ 21	Orange 00 White 01 Red 02 Green 03 Yellow 04 Blue 05 Amber 10 Lunar White 12 Light Green 13 Clear 15 Gray ❷ 20 Black ❷ 21	4.80 (.190") Full 4.80 (.190") Split	A S							
					580, 581, 586 ❷	580			Translucent — Transmitted Color, Smooth Surface, Solid Color Matte — Transmitted Color, Solid Color Filtered Color — White Cap with Colored Filter Insert ❹ Clear — Clear Cap with Colored Filter Insert ❹ Deadfront — Hidden Color and Legend insert with Smoky Gray Cap and Color Insert	T M F C D	Orange 00 White 01 Red 02 Green 03 Yellow 04 Blue 05 Lunar White 12 Clear 15 Black ❷ 21	Orange 00 White 01 Red 02 Green 03 Yellow 04 Blue 05 Lunar White 12 Clear 15 Black ❷ 21	6.90 (.270") 8.40 (.330") 11.20 (.440")	A B C	
					770, 775 ❹	770							6.90 (.270") Full 9.10 (.360") Split 3.00 (.120")	9.10 (.360") Full 9.10 (.360") Split 6.90 (.270") 3.00 (.120")	F S G H
					845, 860, 861	849								6.10 (.240") 8.90 (.350") 3.60 (.140")	A B C
					820, 825 810, 815	820 810								8.40 (.330") 11.20 (.440")	A B

- ❶ Measured from panel to top of pushbutton cap in mm (inches).
- ❷ For a high degree of illumination, a full cap may be used with two lamp devices.
- ❸ Available only with colors: Red, Green, Yellow, Blue.
- ❹ Available in Matte only.
- ❺ Not available for lighted display.
- ❻ For two lamps, two colored inserts with divider.
- ❼ Available in Translucent and Matte only.
- ❽ Available with 206 and 770 Series only.

3 PUSHBUTTON SWITCHES

General Purpose Illuminated Pushbutton Switches (continued)

INCANDESCENT LAMPS

I. BI-PIN BASE FOR 800 SERIES							
Item Number ❶	To Order Lamp Separately	ASA Lamp Number	Designed Volts	Design Amps	Brightness (MSCP) ❷	Brightness Lumens	Lab Average Life (Hours) ❸
02	28-3154-2	7361	5	.06	.05	0.63	100,000
03	28-3154-3	7945	6	.04	.03	0.38	10,000
04	28-3154-4	7328	6	.20	.60	7.92	21,000
05	28-3154-5	7380	6.3	.04	.03	0.38	50,000
06	28-3154-6	7377	6.3	.075	.22	2.89	500
07	28-3154-7	7381	6.3	.20	.40	5.03	50,000
08	28-3154-8	7371	12	.04	.12	1.51	10,000
09	28-3154-9	7330	14	.08	.50	6.29	750
10	28-3154-10	7382	14	.08	.30	3.77	50,000
11	28-3154-11	7370	18	.04	.15	1.89	10,000
12	28-3154-12	7327	28	.04	.34	4.27	7,000
13	28-3154-13	7387	28	.04	.30	3.77	25,000
14	28-3154-14	7876	28	.06	.34	4.27	25,000

II. MIDGET FLANGE BASE FOR 095 AND 099/770 SERIES							
Item Number ❶	To Order Lamp Separately	ASA Lamp Number	Designed Volts	Design Amps	Brightness (MSCP) ❷	Brightness Lumens	Lab Average Life (Hours) ❸
51	28-3155-2	345	6	.04	.03	0.38	10,000
52	28-3155-3	328	6	.20	.60	7.92	1,000
53	28-3155-4	377	6.3	.075	.22	2.89	500
54	28-3155-5	394	12	.04	.12	1.51	10,000
55	28-3155-6	330	14	.08	.50	6.29	750
56	28-3155-7	382	14	.08	.30	3.77	50,000
57	28-3155-8	370	18	.04	.15	1.89	10,000
58	28-3155-9	327	28	.04	.34	4.27	7,000
59	28-3155-10	387	28	.04	.30	3.77	25,000

III. SUBMINIATURE WEDGE BASE 200 AND 500 SERIES							
Item Number ❶	To Order Lamp Separately	ASA Lamp Number	Designed Volts	Design Amps	Brightness (MSCP) ❷	Brightness Lumens	Lab Average Life (Hours) ❸
30	28-3158	56	5	.115	.15	1.89	20,000
31	28-3158-2	79	6	.20	.60	7.92	1,000
32	28-3158-3	84	6.3	.04	.03	0.38	20,000
33	28-3158-4	86	6.3	.20	.40	5.03	20,000
34	28-3158-5	18	14	.04	.13	1.63	5,000
35	28-3158-6	73	14	.08	.30	3.77	15,000
36	28-3158-7	85	28	.04	.30	3.77	7,000
37	28-3158-8	17	28	.06	.65	8.17	5,000

❶ Use this two digit number for installation in switches and indicators.

❷ Standard tolerance for MSCP is $\pm 25\%$.

❸ Average life is for ac operation. DC life will be approximately 50% less. Operating incandescent lamps at 5-10% below rated voltage will generally increase lamp life 200-400%.

NEON LAMPS ❶

IV. T 1 3/4 BI-PIN BASE NEON LAMP FOR ALL 800 SERIES "SHORTY" SWITCHES AND INDICATORS ❷												
Item Number ❶	To Order Lamp Separately	CLC Lamp Number	Circuit Volts AC	Circuit Volts DC	Nominal Current MA	Average Useful Life (Hours)	External Resistance Required	Ignition Voltage AC	Ignition Voltage DC	Bulb Size	Lamp Length	Lead Length
70	28-3156	7A1H	105-125	150	1.5	25,000	47K (1/4 W)	95	135	T-2	.600	.250

V. T 1 3/4 MIDGET FLANGE BASE NEON LAMPS FOR ALL 095,099,700 AND 900 SERIES SWITCHES AND INDICATORS ❷												
Item Number ❶	To Order Lamp Separately	CLC Lamp Number	Circuit Volts AC	Circuit Volts DC	Nominal Current MA	Average Useful Life (Hours)	External Resistance Required	Built-in Resistance	Ignition Voltage AC	Ignition Voltage DC	Bulb Size	Maximum Overall Length
80	28-3157	A1H	105-125	150	1.5	25,000	35K (1/4 W)	None	95	135	T-2	.675
81	28-3157-2	C-24	105-125	150	4.2	8,000	None	35K	95	135	T-2	.675

❶ Neon lamps are not recommended for use with colored caps or inserts, especially those colored green or blue.

❷ Recommended external series resistor values shown for indicated average useful life are for lamp and resistor combinations used across 110-125V ac. 1/4 W, $\pm 10\%$ tolerance.

❸ Use this two digit number for installation in switches and indicators.