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CUSTOM SWITCHES



ROTARY SWITCHES



INDICATOR LIGHTS



SOLENOIDS



MINIATURE SWITCHES



ENCODERS

Switch Selection Considerations

During more than a quarter century of assisting customers with their Presslite switch requirements, Electroswitch has learned that the best rule is... evaluate before you buy! Test samples of selected switches should be installed in the projected equipment, and should be exposed to actual operating conditions and environments before final procurement.

In evaluation and selection, some general considerations are worth stating which apply to all types of switches. These include...

Over-Specification

Do not specify a higher power switch than is actually required, on the assumption that the higher rating will automatically provide a safety factor and increase its life in the application. It doesn't! In fact, the exact opposite may be true, because of the high mechanical loads necessary to assure adequate contact force. In addition, the necessarily greater contact mass may introduce intolerable "bounce" problems into the overall circuit.

Low Level (Dry Circuit)

Although there is no industry standard definition of low level or dry circuit, and they tend to be used interchangeably, it is generally understood that these terms describe conditions where applied voltage is insufficient to puncture any chemical film which may form over the contacts. So, switch design features to look for in this type of circuit application are:

- Wiping Action, to cut through the film
- Hermetically Sealed Contacts, to provide a controlled atmosphere
- High Contact Pressure, to pierce the film

Lens Color

A broad range of lamp brightness is available for different switch applications. Generally, lenses of white, red, and orange give the greatest apparent brightness for a given lamp. Because of the spectral distribution of the incandescent filament, and the response of the human eye, green is noticeably dimmer; blue should be avoided in many applications.

Where a neon lamp is used, smaller caps are recommended ... in off-white (for greater transparency), red, and orange. Green and blue are not usable.

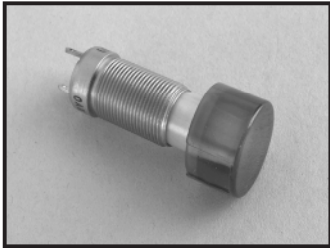
Standards

Certain styles have been designated as standards. These products generally offer shorter lead times.

Product Support

There are many considerations that must be kept in mind during the switch selection process. Ultimately, the entire process reverts again to the basic rule - evaluate before you buy. Electroswitch has for many years worked with customers to provide just the right switch for the application, be it a standard unit, a slightly modified version, or a special design. The application engineering staff is prepared to discuss special design features and colors at any time to assure switch performance and acceptability in your end product or system.

Presslite Switch Selection Guide

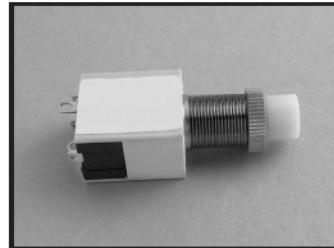


Description	Type	Page Number
Friction Cap Bases		4
3 Amp S.P.D.T. 2 Circuit Form Z	543,545,546	5
General Purpose Indicator Base	516, 518	5
5 Amp S.P.D.T. Form C	532	6
5 Amp D.P.D.T. Form C	520, 521	6
10.1 Amp S.P.D.T. Form C	5710, 5810	6
10.1 Amp D.P.D.T. Form C	5720, 5820	7
15 Amp S.P.D.T. Form C	517, 519	7

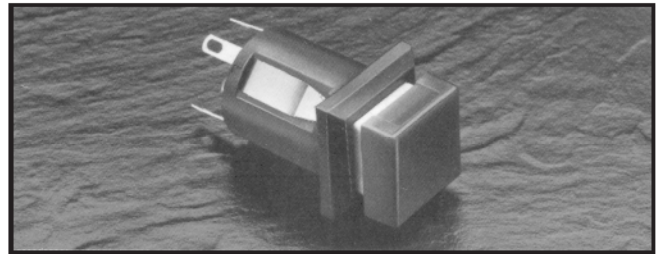
Pushbutton Cap Selection Cap Key	8
Hardware	
Recess Adaptor	9
Flush Snap-In Mount	10
Barrier Snap-In Mount	10
Specialty Hardware	
Splashproof and Oiltight	11
Splashproof and E.M.I. Suppressed	11



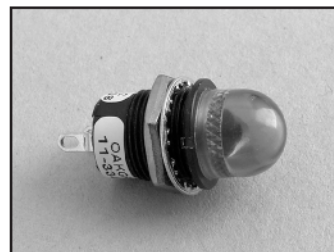
Watertight		
3 Amp S.P.D.T. 2 Circuit Form Z	643	12



Description	Type	Page Number
Low Profile Switches		
5 Amp Snap Action	416,616,418,618	13
10.1 Amp Snap Action	6710,6720 6810,6820	14



Snap-In Switches		
.5 Amp	591	15



General Purpose		
Sub-Miniature	99-33180	17
Miniature, Neon	31-36180,31-36280	17
Miniature	11-33480,59-52480	18
	14-30080	19
13-VM	305,309	20
Miniature Neon	33-30880,33-30881	20
Miniature	14-32280	21
Miniature	14-35180	21

Optolite Indicator Selection Guide



Description	Series	Page Number
Watertight		
Sub-Miniature, Watertight	95-33180	22
Miniature, Neon Watertight	31-36680, 31-36681	22
Miniature, Watertight	11-35182, 15-30083	23
Miniature, Watertight	VM-700	24

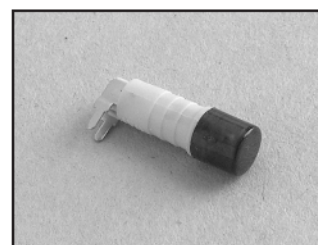


E.M.I. Supressed

Sub-Miniature, Optional E.M.I. Suppression	98-36980, 99-36980	25
Miniature, Neon E.M.I. Suppressed	38-36180, 38-36280	25
Miniature, E.M.I. Suppressed	18-36880	26
Miniature, E.M.I. Suppressed Watertight	18-36680	26



Description	Series	Page Number
Press-to-Test		
Miniature, Optional Press-to-Test	59-52280, 59-52380	27
Miniature, Press-to-Test	01-91180	27
Standard Size, Press-to-Test	02-91180	28
Miniature, Watertight Press-to-Test	05-90880	28
	05-91182	29
Watertight, Press-to-Test	06-91182	29
Standard Size	04-VM905	30
Miniature, Press-to-Test	03-90980	30
Miniature, Press-to-Test	03-93480, 03-93481	31
Miniature, Press-to-Test	03-90981	32
Miniature, E.M.I. Suppressed, Watertight, Press-to-Test	08-83283	33
Miniature, E.M.I. Suppressed	08-83281	33



Push-in

Sub-miniature "Little QT"	99-33080, 99-33081	34
Little QT Lamps		34

Presslite Switches

INDICATOR LIGHTS



Presslites Friction Cap

A versatile and expanding line of modular Presslite switches and matching indicator assemblies is the end product of years of continuing design improvements. The Friction Cap Presslite Series provides the broadest possible flexibility in terms of electrical characteristics, appearance and mounting procedure, allowing the user to "engineer" a switch assembly to meet specific requirements.

Many pushbutton sizes and configurations are offered, with sufficient space for engraved legends or symbols. A wide range of mounting hardware is available to meet virtually every panel appearance or mounting requirement.

Presslites Friction Cap Bases

A wide range of electrical ratings and contact configurations are available in both alternate (push-on/push-off) and momentary operation. All assemblies accept size T-1 3/4 lamps. Unless otherwise specified in the following pages, materials for Friction Cap bases are as follows:

Contacts

Coin Silver (Gold plated contacts are available on some types.)

Solder Terminals

Coin Silver or Plated Brass

Terminal Insulation

Molded Thermoset Plastic

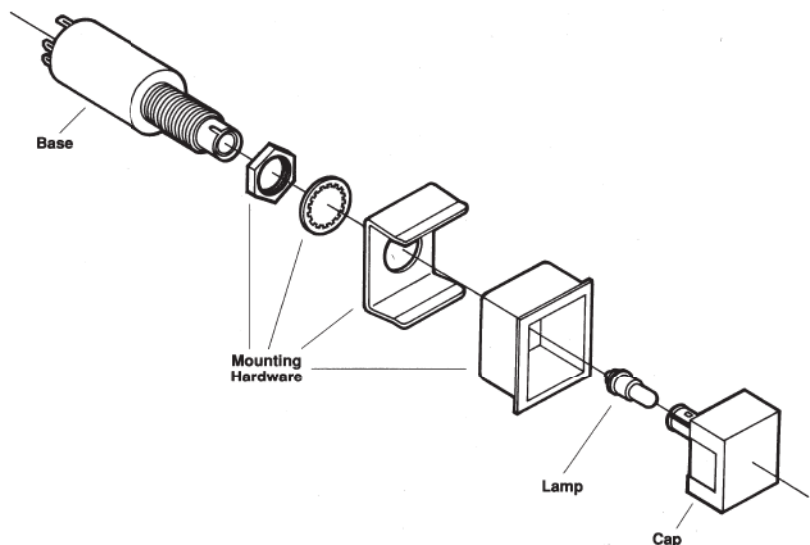
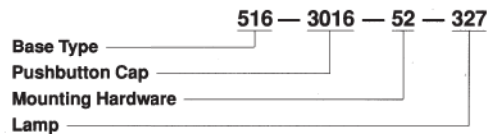
Housing

Anodized Aluminum (except 10.1 amp bases, which have thermoplastic housing and nickel plated brass mounting bushing.)

Switch Life Expectancies

<u>Rating</u>	<u>Type</u>	<u>Expected Life at Rated Load</u>
.5 Amp	591	1 to 3 million cycles
3 Amps	543, 546, 643	1 to 2 million cycles
5 Amps	416, 418, 516, 518, 520, 521, 616, 618	500,000 to 1 million cycles
10.1 Amps	5710, 5720, 5810, 5820, 6710, 6720, 6810, 6820	100,000 cycles
15 Amps	517, 519	50,000 to 100,000 cycles

The complete part number for a Friction Cap Presslite assembly consists of four blocks of digits, such as the following:



Presslites Friction Cap Bases

INDICATOR LIGHTS



Type 516

ALTERNATE ACTION

Switch Characteristics

Contact rating: 5 amps resistive at 115 VDC or 28 VDC.

Nominal pushbutton travel: .219 in

Nominal operating force: 24 oz.

Material and Finishes

Pushbutton: high impact resistant plastic per L-P-349.

Pushbutton retention and knurled nut: aluminum, bright anodized.

Keywasher and mounting nut: brass, nickel plated.

Housing: aluminum, anodized.

Terminals and Contacts: coin silver

Terminal Board: molded thermoset plastic

Lamp

T-1¾ incandescent or T-2 neon with midjet flange base. See Lamp Selection Guide. Lamp may be replaced from front of panel by removing pushbutton retention nut. Switches will not operate with lamp removed.

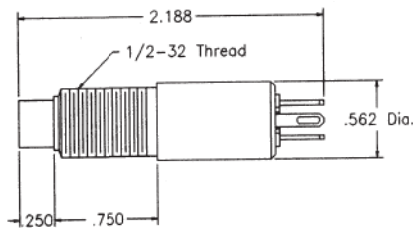
Weight

Approximately .5 oz.

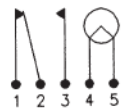
Styles

Where maximum indication of pushbutton illumination is of primary importance, the reflector style retention nut is recommended.

5 Amp Switch Base



Terminal Assignment



Schematic

Single pole, double throw (Form C) snap action contacts.
Contact rating: 5 amps resistive at 115 VAC or 28 VDC.

Type 518

MOMENTARY ACTION

Switch Characteristics

Contact rating: 5 amps resistive at 115 VDC or 28 VDC.

Nominal pushbutton travel: .219 in

Nominal operating force: 24 oz.

Material and Finishes

Pushbutton: high impact resistant plastic per L-P-349.

Pushbutton retention and knurled nut: aluminum, bright anodized.

Keywasher and mounting nut: brass, nickel plated.

Housing: aluminum, anodized.

Terminals and Contacts: coin silver

Terminal Board: molded thermoset plastic

Lamp

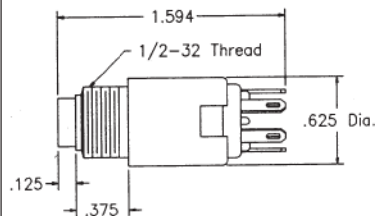
T-1¾ incandescent or T-2 neon with midjet flange base. See Lamp Selection Guide. Lamp may be replaced from front of panel by removing pushbutton retention nut. Switches will not operate with lamp removed.

Weight

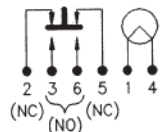
Approximately .5 oz.

- Nominal operating force: 32 oz.
- Nominal pushbutton travel: .094 in.

3 Amp Switch Base



Terminal Assignment



Schematic

Single pole, 2 circuit double break (Form Z). Contact rating: 3 amps resistive at 115 VAC or 30 VDC.
Nominal pushbutton travel: .0125 in. including .031 in. pretravel and .031 in. overtravel.
Mounting hardware: intended for use with styles 7 and 8 (snap-in mounting adaptors).

Type 543

MOMENTARY ACTION

- Nominal operating force: 14 oz. to close normally open contacts.

Type 546

MOMENTARY ACTION

- Contacts: Gold plated for low level switching.
- Nominal operating force: 7 oz. to close normally open contacts.

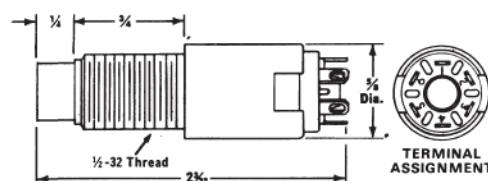
Type 545

MOMENTARY ACTION

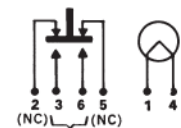
Momentary Action SPDT 3A @ 30VDC or 115VAC

- Contacts: Gold plated for low level switching
- Nominal operating force: 7 oz. to close normally open contacts
- Nominal pushbutton travel: 1/8" including 1/32" pre travel and 1/32" over travel

3 Amp Switch Base



TERMINAL ASSIGNMENT



SCHEMATIC

Single pole, 2 circuit double break (Form Z). Contact rating: 3 amps resistive at 115 VAC or 30 VDC.
Nominal pushbutton travel: .0125 in. including .031 in. pretravel and .031 in. overtravel.

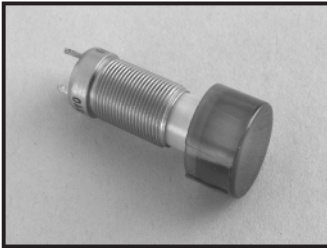
Presslites

Friction Cap Bases

INDICATOR LIGHTS



Type 532



- Provides same pushbutton projection as Presslite switch bases in all styles of mounting hardware.

Material and Finishes

Pushbutton: high impact resistant plastic per L-P-349.
Pushbutton retention and knurled nut: aluminum, bright anodized.
Keywasher and mounting nut: brass, nickel plated.
Housing: aluminum, anodized.
Terminals and Contacts: coin silver
Terminal Board: molded thermoset plastic

Lamp

T-1 $\frac{3}{4}$ incandescent or T-2 neon with midget flange base. See Lamp Selection Guide. Lamp may be replaced from front of panel by removing pushbutton retention nut. Switches will not operate with lamp removed.

Weight

Approximately .5 oz.

Type 520

- Nominal operating force: 32 oz.
- Nominal pushbutton travel: .219 in.

Type 521

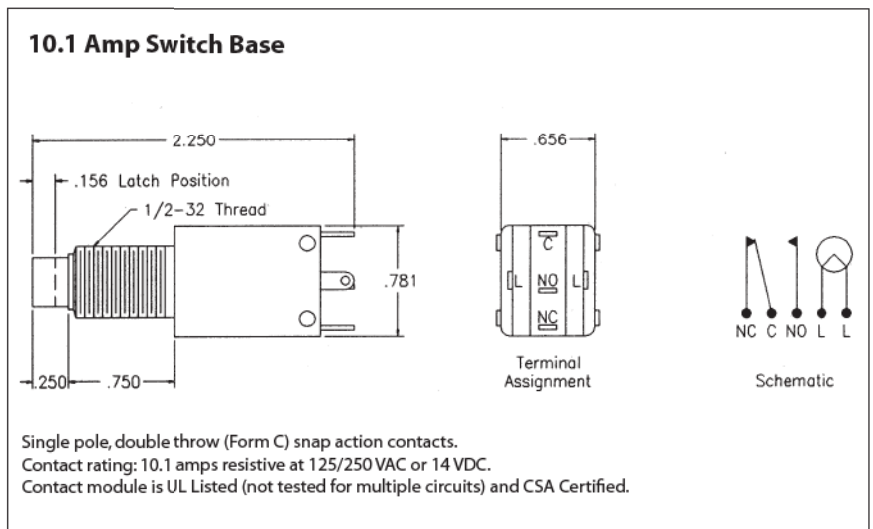
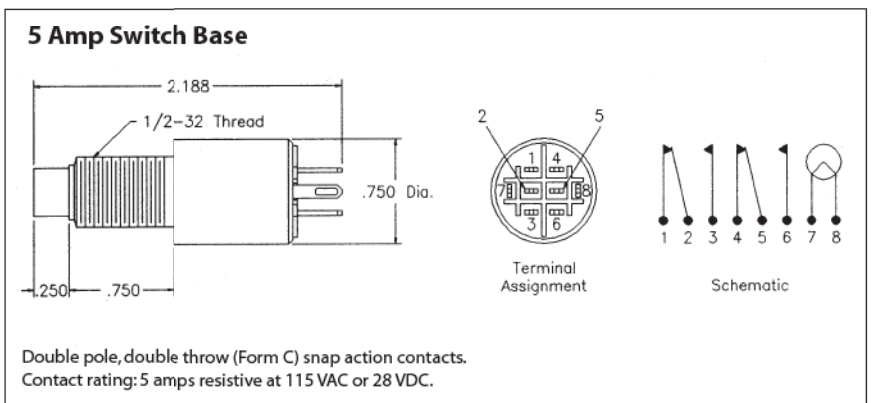
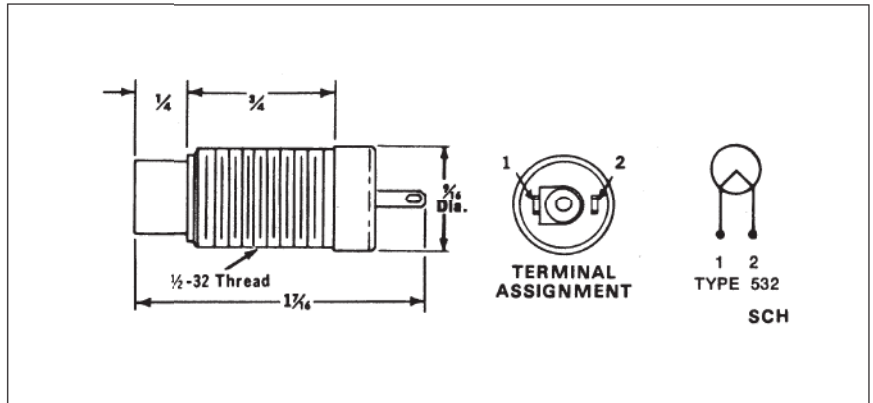
- Nominal operating force: 40 oz.
- Nominal pushbutton travel: .094 in.

Type 5710 ALTERNATE LATCHING ACTION

- Nominal operating force: 12 oz.
- Nominal pushbutton travel: .219 in.
- Latching action: Pushing plunger closes N.O. contacts and latches plunger. Pushing plunger again releases contacts and plunger returns to "out" position. Plunger latch point is .156 in. from "out" position. Swing and latch interlocked to prevent teasing.

Type 5810 MOMENTARY ACTION

- Nominal operating force: 10 oz.
- Nominal pushbutton travel: .094 in.

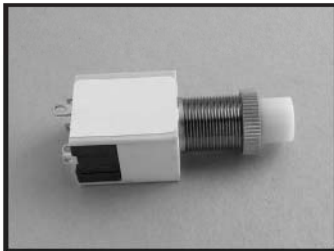


Presslites Friction Cap Bases

INDICATOR LIGHTS



Type 5720 ALTERNATE LATCHING ACTION



Switch Characteristics

- Double pole, double throw contact rating 10.5 amp resistive @ 125/250 VAC or 28 VDC - 5 amp resistive @ 30 VDC
- Nominal operating force: 20 oz.
- Nominal pushbutton travel: .219 in.
- Latching action: Pushing plunger closes N.O. contacts and latches plunger. Pushing plunger again releases contacts and plunger return to "out" position. Plunger latch point is .156 in. from "out" position. Switch and latch interlocked to prevent teasing.

Type 5820

- Nominal operating force: 16 oz.
- Nominal pushbutton travel: .094 in.

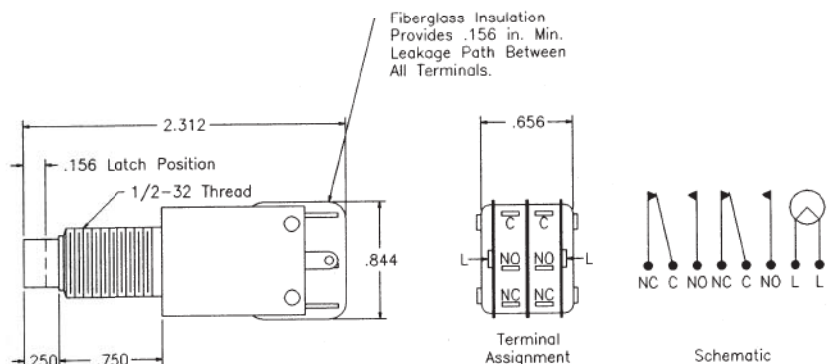
Type 517 ALTERNATE ACTION

- Nominal operating force: 32 oz.
- Nominal pushbutton travel: .219 in.

Type 519 MOMENTARY ACTION

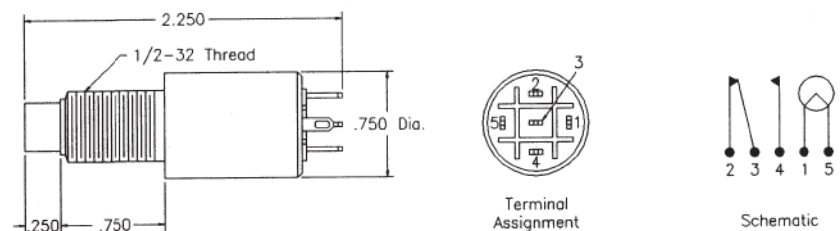
- Nominal operating force: 40 oz.
- Nominal pushbutton travel: .219 in.

10.1 Amp Switch Base



Double pole, double throw (Form C) snap action contacts.
Contact rating: 10.5 amps resistive at 125/250 VAC or 28 VDC, 5 amps resistive at 30 VDC.
Contact module is UL Listed (not tested for multiple circuits) and CSA Certified.

15 Amp Switch Base

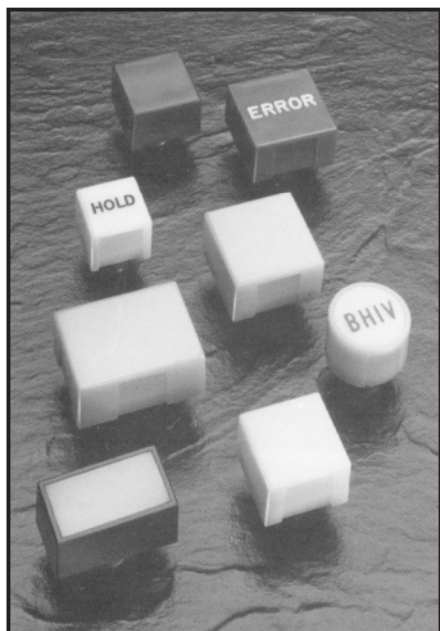


Single pole, double throw (Form C) snap action contacts.
Contact rating: 15 amps resistive at 115 VAC or 28 VDC.

Presslites

Pushbutton Cap

INDICATOR LIGHTS



Presslites Friction Pushbutton Caps

The Friction Cap Presslite switch line offers a variety of pushbuttons that vary by style, shape, size, and color. The buttons are made from high impact-resistant plastic per L-P-349. The pushbutton code is based on the cap's characteristics, and is used in the complete assembly part number. All Presslite switches use size T-1 3/4 incandescent midjet flange base lamps. Available lamps are listed in the Lamp Selection Guide.

Presslite caps allow for engraving or printing of legends on the button's surface, in order to identify function or for added convenience. Most Electroswitch distributors provide custom engraving of Presslites and Indicators, and the factory maintains a well equipped engraving and hot stamping department.

Standards

Some pushbutton caps have been designated as standards. They are 5/8 in. round, 5/8 in. square, and 3/4 in. x 1 in. rectangular. These products generally offer shorter lead times.

Style

Three basic cap styles, are available: #1 features wrap-around construction, providing front and side surfaces of one continuous piece of translucent material. This is the most frequently used style and

provides the greatest legend area.

#2 features a flat colored lens on the top and black opaque sides. The legend area is reduced due to the .031 in. frame, but the cap is useful in applications where no light transmission through the sides of the button is allowed.

#4 has an off-white colored wrap-around cap with an internal colored filter. When lit, the button takes on the filter color. This cap provides maximum legibility in the "on" position, and is easily read in the presence of ambient light.

Shape and Size

Three shapes are available: round, square, and rectangular. Round and square caps come in 1/2 in., 5/8 in., and 3/4 in. sizes, the rectangular cap is available in 3/4 in. x 1 in. sizes.

Color

Six standard colors are available: white, off-white, red, green, blue, and orange. Internal color filters are not available in colors white and off-white. For custom colors contact the factory.

Keying

Keyed (non-rotatable) circular caps are available. Mounting hardware for square and rectangular caps provides inherent keying, and non-keyed caps will be provided.

	3	0	1	6	
Shape and Size					Shape and Size
Keying					1 1/2 in. Round
Style					2 1/2 in. Square
Color					3 5/8 in. Square
					4 3/4 in. Square
					5 3/4 in. Round
					6 5/8 in. Round
					12 3/4 in. x 1 in. Rectangular
					Keying
					0 Not Keyed
					1 Keyed
					Style
					1 Solid Color
					2 Black Sides
					4 Internal Filter
					Color
					5 White
					6 Red
					7 Green
					11 Blue
					16 Orange
					17 Off-white

FRICTION CAP PUSHBUTTON AVAILABILITY				
Shape and Size		Pushbutton Styles		
		1	2	4
Round	1/2 in.	X	X	--
	5/8 in.	X	X	X
	3/4 in.	X	X	X
Square	1/2 in.	X	X	X
	5/8 in.	X	X	X
	3/4 in.	X	--	X
Rectangular	3/4 in. x 1 in.	X	X*	X

Shaded "X" indicates standard size and style. *Pushbuttons made from polycarbonate per L-P-393.

Presslites

Friction Cap Hardware

INDICATOR LIGHTS



Style 7

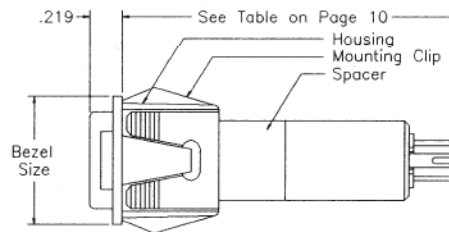
Flush Snap-in Mount



Material and Finishes

Housing: black thermoplastic
Mounting clip: stainless steel
Spacer: aluminum

Mounting Hardware Configuration



Mounting Dimensions

Pushbutton Size	Bezel Size	Single Unit Cutout ± .005	Stacked Units*
5/8 in. Square §	.81 in. Square	.745 in. for panels .050 in. to .120 thick .755 in. for panels .120 in. to .187 thick	Add .815 in. x N
3/4 in. Square	.94 in. Square	.870 in. for panels .050 in. to .120 thick .880 in. for panels .120 in. to .187 thick	Add .940 in. x N
3/4 in. x 1 in Rectangle	.94 in. x 1.18 in. Rectangle	.870 in. x 1.110 in.	Add .942 in. x N Vertical Add 1.182 in. x N Horizontal

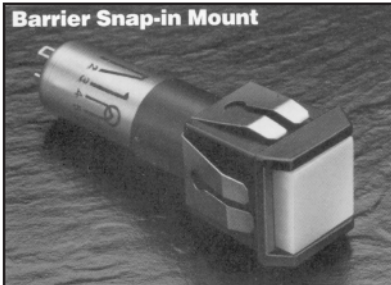
*N = Number of additional units.

Example: Cutout length for three 5/8 in. square mounts is .815 in. x 2 + .745 in. = 2.375 in. ± .005.

§ Not recommended for use with 10.1 amp Presslite bases since they will not pass through panel cutout.

Style 8

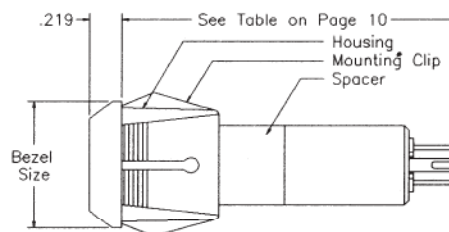
Barrier Snap-in Mount



Material and Finishes

Housing: black thermoplastic
Mounting clip: stainless steel
Spacer: aluminum

Mounting Hardware Configuration



Mounting Dimensions

Pushbutton Size	Bezel Size	Single Unit Cutout ± .005	Stacked Units*
5/8 in. Square §	.81 in. Square	.745 in. for panels .050 in. to .120 thick .755 in. for panels .120 in. to .187 thick	Add .815 in. x N
3/4 in. Square	.94 in. Square	.870 in. for panels .050 in. to .120 thick .880 in. for panels .120 in. to .187 thick	Add .940 in. x N

*N = Number of additional units.

Example: Cutout length for three 5/8 in. square mounts is .815 in. x 2 + .745 in. = 2.375 in. ± .005.

§ Not recommended for use with 10.1 amp Presslite bases since they will not pass through panel cutout.

Presslites

Friction Cap Specialty Hardware

INDICATOR LIGHTS



Splashproof and Oiltight



Switch or Indicator Bases

All Presslite base types shown on pages 5 through 8 except Types 543 and 546 may be used with this mounting accessory.

Material and Finishes

Pushbutton: high impact resistant plastic per L-P 349.

Rubber boot: gray silicone rubber supplied with bright anodized adaptor. Black neoprene rubber supplied with black anodized adaptor. (Neoprene seals recommended for oiltight applications.)

Mounting adaptor: aluminum, bright or black anodized.

Hex nut: brass, nickel plated.

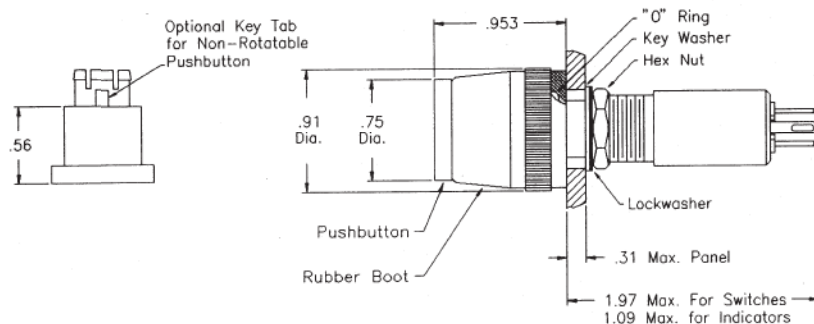
Lockwasher: stainless steel.

Lamp

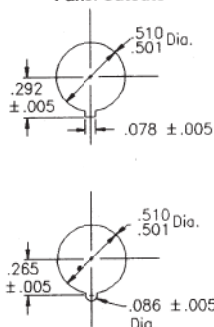
T-1 ¾ bulb with midget flange base. See Lamp Selection

Guide. Lamp may be replaced from front of panel by removing pushbutton.

Mechanical Drawing



Panel Cutouts



Complete Assembly Part Numbers (Less Lamp) With Rotatable Pushbutton and Type 516 Switch

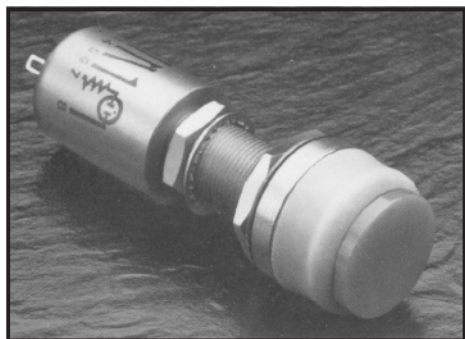
Translucent Pushbutton Colors	Mounting Adaptor Finish	
	Bright Anodized	Black Anodized
White	516-9015-91	516-9015-92
Red	516-9016-91	516-9016-92
Green	516-9017-91	516-9017-92
Blue	516-90111-91	516-90111-92
Orange	516-90116-91	516-90116-92
Off-white	516-90117-91	516-90117-92

To order complete assembly with other base type, change Base Number 516 to desired type. Example: 521-9015-91.

To order non-rotatable pushbutton change second digit of Pushbutton Number from 0 to 1. Example: 516-9115-91.

To order complete assembly with lamp installed, add Lamp Number as 3 digit suffix to Part Number. Example: 516-9015-91-327.

Splashproof and E.M.I. Suppressed



Switch or Indicator Bases

All Presslite base types shown on pages 5 through 8 except Types 543 and 546 may be used with this mounting accessory.

Material and Finishes

Pushbutton: high impact resistant plastic per L-P 349.

Rubber boot: gray silicone rubber

Hex nut and spacers: brass, nickel plated.

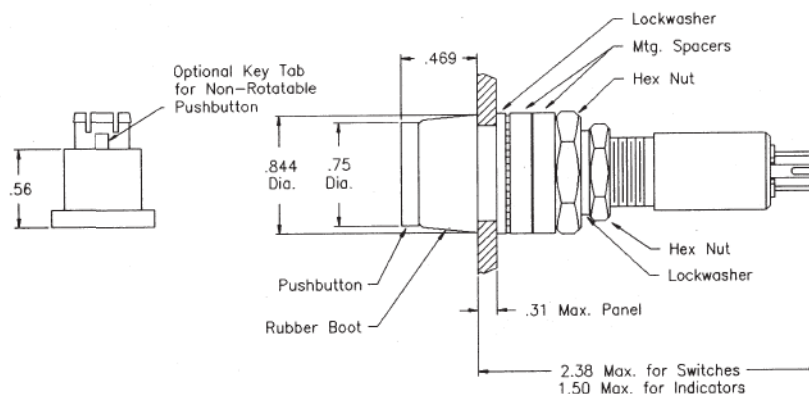
Lockwashers: stainless steel.

Lamp

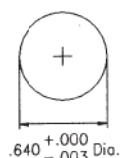
T-1 ¾ bulb with midget flange base. See Lamp Selection

Guide. Lamp may be replaced from front of panel by removing pushbutton.

Mechanical Drawing



Panel Cutouts



Complete Assembly Part Numbers (Less Lamp) With Type 516 Switch

Translucent Pushbutton Colors	Rotatable Pushbutton	
	Rotatable Pushbutton	Non-Rotatable Pushbutton
White	516-53660-10-5	516-53660-11-5
Red	516-53660-10-6	516-53660-11-6
Green	516-53660-10-7	516-53660-11-7
Blue	516-53660-10-11	516-53660-11-11
Orange	516-53660-10-16	516-53660-11-16
Off-white	516-53660-10-17	516-53660-11-17

To order complete assembly with other base type, change Base Number 516 to desired type. Example: 521-53660-10-5.

To order complete assembly with lamp installed, add Lamp Number as 3 digit suffix to Part Number. Example: 516-53660-10-5-327.

Presslites Watertight Switch

INDICATOR LIGHTS



Watertight, 3 Amp Momentary Action



This switch features a gray silicone rubber boot and rubber washer which provide a true watertight seal from the front of the mounting panel. The pushbutton screws into the switch base and may be removed from the front of the panel for relamping.

When switching a 3 amp resistive load, life expectancy exceeds 1 million cycles.

The linear action switch mechanism is provided with a special overtravel device which prevents damage to the contacts from excessive pushbutton pressure and assures positive engagement of the contacts at an optimum force. To assure immunity to mildly corrosive environments, all terminals, contacts, and springs are heavy gold flashed.

Switch Characteristics

Contact rating: 3 amps resistive at 115 VAC or 30 VDC.
Nominal pushbutton travel: .125 in. including .031 in. pretravel and .031 in. overtravel.

Nominal operating force: 48 oz.

Material and Finishes

Pushbutton: high impact resistant plastic per L-P-349.

Lens holder: aluminum, black anodized.

Rubber boot and "O" ring: silicone rubber

Mounting tube and spacers: aluminum, anodized per MIL-A-8625.

Keywasher: brass, nickel plated.

Lockwasher: stainless steel.

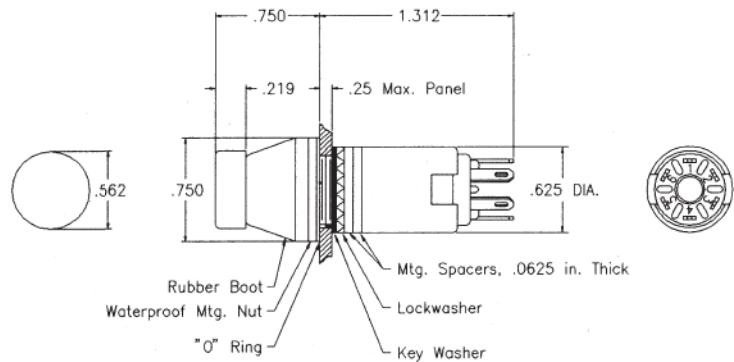
Terminal board: molded thermoset plastic.

Terminals and contacts: coin silver, gold plated.

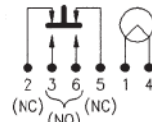
Lamp

T-1 ¾, bulb with midget flange base. See Lamp Selection Guide. Choose from Group A.

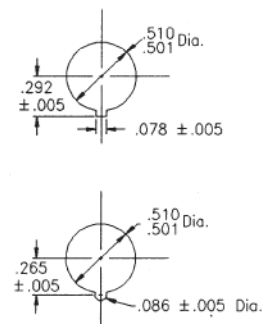
Type 643



Schematics



Panel Cutouts



Key washer and slot may be omitted in some installations.

Complete Assembly Part Numbers (Less Lamp)

Transparent Pushbutton Colors	Part Number
Clear	643-35-7
Red	643-36-7
Green	643-37-7
Amber	643-38-7
Blue	643-311-7
Orange	643-316-7
Off-white	643-317-7

Translucent colors: Add "TL" to first Dash Number of Part Number. "White" if translucent color specified. To order complete assembly with lamp installed, add Lamp Number as 3 digit suffix to Part Number. Example: 643-36-7-327.

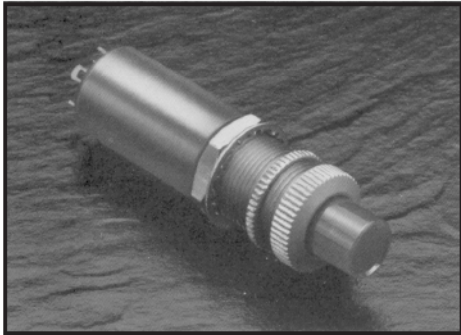
Presslites

Low Profile Switches

INDICATOR LIGHTS



5 Amp Snap Action



Switch Characteristics

Contact rating:

5 amps resistive at 115 VDC or 28 VDC.

Nominal pushbutton travel: .219 in.

Nominal operating force: 24 oz.

Material and Finishes

Pushbutton: high impact resistant plastic per L-P-349.

Pushbutton retention and knurled nut: aluminum, bright anodized.

Keywasher and mounting nut: brass, nickel plated.

Housing: aluminum, anodized.

Terminals and Contacts: coin silver

Terminal Board: molded thermoset plastic

Lamp

T-1 3/4 incandescent or T-2 neon with midget flange base.

See Lamp Selection Guide. Lamp may be replaced from front of panel by removing pushbutton retention nut.

Switches will not operate with lamp removed.

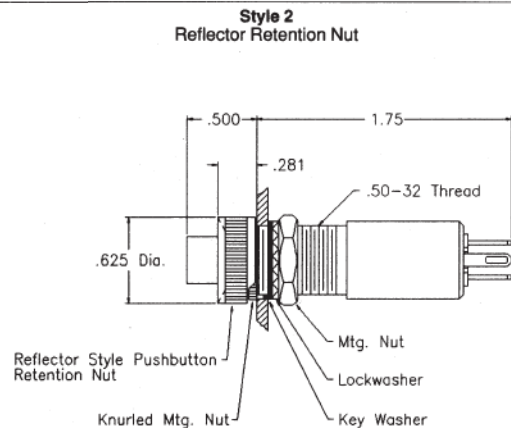
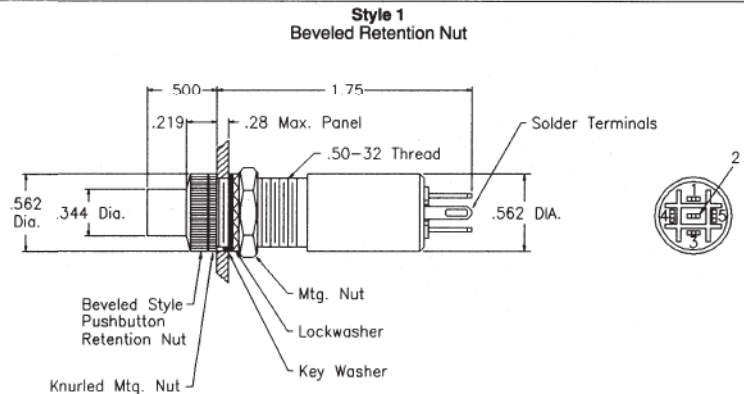
Weight

Approximately .5 oz.

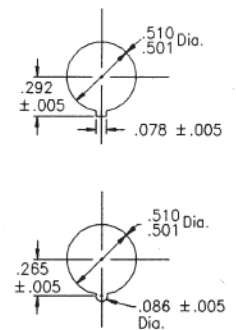
Styles

Where maximum indication of pushbutton illumination is of primary importance, the reflector style retention nut is recommended.

Alternate Action Type 416, Type 616 Momentary Action Type 418, Type 618

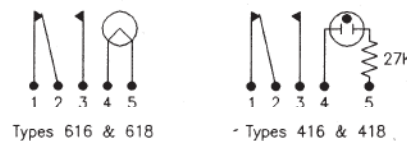


Panel Cutouts



Key washer and slot may be omitted for mounting in round hole.

Schematics



Complete Assembly Part Numbers For Style 1 Pushbutton Retention Nut

Translucent Pushbutton Colors	Incandescent (Less Lamp)		115 VAC Neon (Includes A1H Lamp)	
	Alternate Action	Momentary Action	Alternate Action	Momentary Action
White	616-5-1	618-5-1	416-5-1-A1H	418-5-1-A1H
Red	616-6-1	618-6-1	416-6-1-A1H	418-6-1-A1H
Green	616-7-1	618-7-1	-	-
Amber	616-8-1	618-8-1	416-8-1-A1H	418-8-1-A1H
Blue	616-11-1	618-11-1	-	-
Orange	616-16-1	618-16-1	-	-
Off-white	616-17-1	618-17-1	416-17-1-A1H	418-17-1-A1H

To order switch with reflector style pushbutton retention nut (style 2), change hardware designation number from 1 to 2. Example: 616-5-2. To order switch with incandescent lamp installed, add Lamp Number as 3 digit suffix to part number. Example: 616-5-1-327.

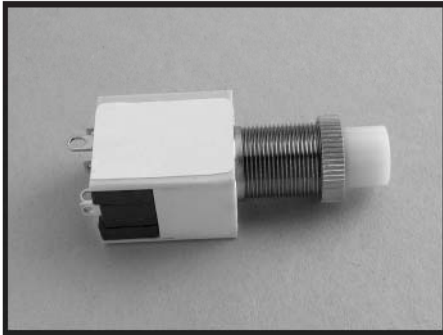
Presslites

Low Profile Switches

INDICATOR LIGHTS



10.1 Amp Snap Action



Alternate Action: Types 6710, 6720
Momentary Action: Types 6810, 6820

Switch Characteristics

Contact rating:
 10.1 amps resistive at 125/250 VAC or 14 VDC
 5 amps resistive at 30 VDC.
 Nominal pushbutton travel:
 Alternate action switches, .219 in.
 Nominal operating force:
 Single pole switches, 12 oz.
 Double pole switches, 20 oz.

Material and Finishes

Pushbutton: high impact resistant plastic per L-P-349.
 Knurled nut: aluminum, bright anodized.
 Keywasher and mounting nut: brass, nickel plated.
 Lockwasher: stainless steel.
 Housing molded thermoplastic.
 Contacts: coin silver

Lamp

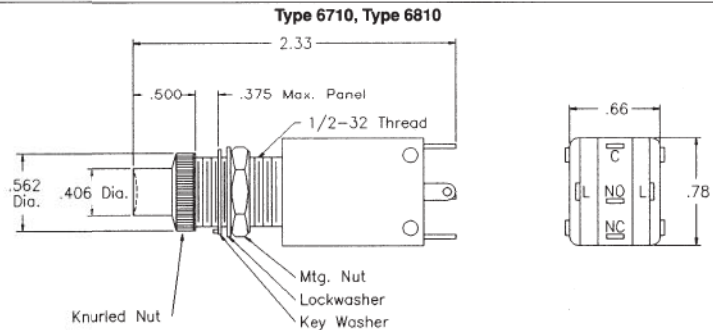
T-1¾ incandescent with midget flange base or ALH neon.
 See Lamp Selection Guide. Lamp may be replaced from front of panel by removing pushbutton.

Weight

Approximately .6 oz.

Solder Terminals

Terminals accept AMP FASTON No. 60729-1 receptacles or equivalent.

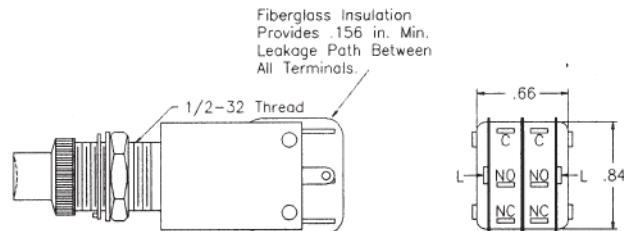


Schematics



SINGLE POLE, DOUBLE THROW
 Type 6710 Alternate Action
 Type 6810 Momentary Action

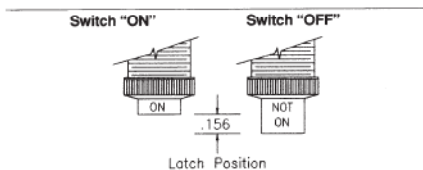
Type 6720, Type 6820



Schematics

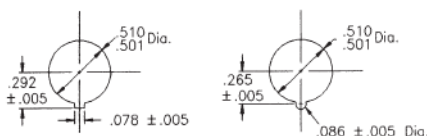


DOUBLE POLE, DOUBLE THROW
 Type 6720 Alternate Action
 Type 6820 Momentary Action



Alternate action switches may be ordered with pushbuttons marked as shown to give positive indication of switch position.

Panel Cutouts



Complete Assembly Part Numbers (Less Lamp) For Switches With Unmarked Pushbutton

Translucent Pushbutton Colors	Single Pole		Double Pole	
	Double Throw, 2 Circuit		Double Throw, 2 Circuit	
	Alternate	Momentary	Alternate	Momentary
White	6710-5	6810-5	6720-5	6820-5
Red	6710-6	6810-6	6720-6	6820-6
Green	6710-7	6810-7	6720-7	6820-7
Amber	6710-8	6810-8	6720-8	6820-8
Blue	6710-11	6810-11	6720-11	6820-11
Orange	6710-16	6810-16	6720-16	6820-16
Off-white	6710-17	6810-17	6720-17	6820-17

To order switch with "Not On" marking on pushbutton, add 5 to Part Number suffix. Examples: 6710-55, 6710-56. To order switch with lamp installed, add Lamp Number as 3 digit suffix to part number. Example: 6710-5-327.

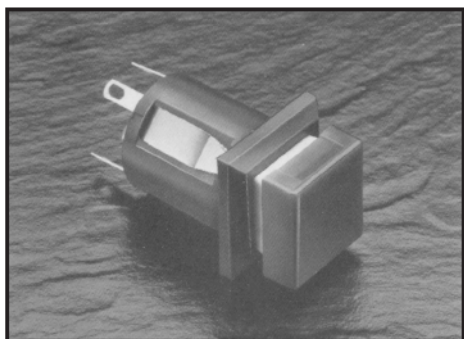
Presslites

Snap-In Switches

INDICATOR LIGHTS



.5 Amp Momentary Action Switch and Matching Indicator



Switch Characteristics

Contact rating: .5 amp resistive at 30 VDC. .1 amp resistive at 115 VAC.

Nominal pushbutton travel: .1 in.

Nominal operating force: 4 oz.

Material and Finishes

Pushbuttons: high impact plastic per L-P-349.

Housing: black thermoplastic.

Mounting clip: stainless steel.

Lamp terminals: beryllium copper, tin plated.

Switch terminals and contacts: brass, gold plated.

Lamp

T-1 3/4 incandescent, with midget flange base. See Lamp Selection Guide. Lamp remains stationary when pushbutton is depressed.

Mounting

Assemblies press fit into .687 in. $\pm$.005 in. dia. holes from front of panel. Mounting clips accommodate panels from .063 in. to .188 in.

Weight

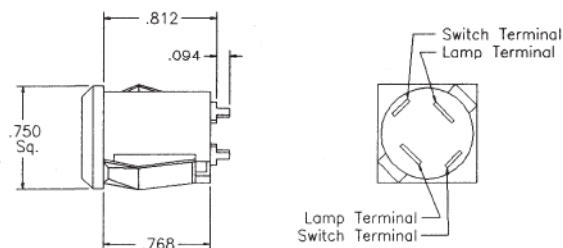
Approximately .25 oz.

Solder Terminals

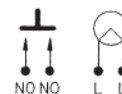
Terminals accept AMP FASTON No.60415-1 receptacles or equivalent.

Type 591 Switch

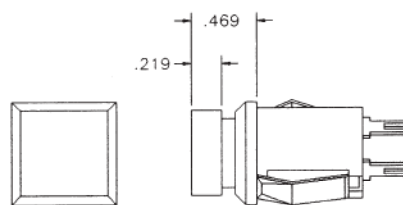
Printed Circuit Terminals Type 591



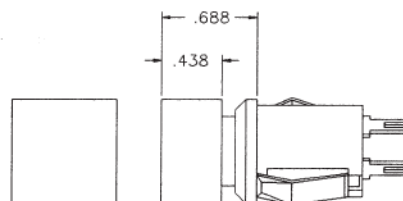
Schematics



5/16 in. Square Low Profile Pushbutton



3/4 in. Square Pushbutton



Optolite Indicators

INDICATOR LIGHTS



This section of the catalog has been compiled to provide the necessary specification information as concisely as possible. In particular, the Indicator Selection Guide, found on pages two and three, serves as an effective tool. General availability is summarized in the table below.

Complete assembly part numbers are tabulated for each indicator/cap combination. Very simple substitutions in these numbers allow changes in color and substitution of translucent for transparent lenses. The desired lamp number is simply added as a suffix to the part number.

Our panel indicators embody the best materials and performance features. Materials, finishes, and workmanship conform to military, federal, or industry specifications. A cross reference listing of Electroswitch indicators which are on the MIL-L-3661 Qualified Products List and also those which may be ordered against MS (Military Standard) designations is shown on page 35.

Because of the wide variety of items in the Electroswitch Optolite Indicator line, it is possible to select a standard (off-the-shelf) unit to meet a precise requirement. Variations can also be furnished, such as caps in special colors or hot stamping and engraving.

The Electroswitch sales staff is always at your service whenever additional information or assistance is required.

Indicator Availability Summary	Sub-Miniature	Miniature	Miniature, Neon	Standard
General Purpose	F	B	R	—
Watertight	F	B	F	—
E.M.I. Suppressed	F	F	F	—
E.M.I. Suppressed and Watertight	—	F	F	—
Press-to-Test	—	R	—	R
Watertight, Press-to-Test	—	B	—	R
E.M.I. Suppressed and Watertight, Press-to-Test	—	R	—	—

R - Indicator available in style that mounts from rear of panel

F - Indicator available in style that mounts from front of panel

B - Indicator available in both rear and front mounting styles

Optolite Indicators General Purpose

INDICATOR LIGHTS



Sub-Miniature

99-33180 Series



Material and Finishes

Mounting tube, black glass filled nylon per MIL-M-19887.
Mounting nut aluminum, black anodized per MIL-A-8625A.
Lockwasher, stainless steel or steel, nickel plate. Brass terminals, tin plated per MIL-T-10727A.

Cap Assembly

Lens, high impact-resistant plastic per L-P-349.

Lamp

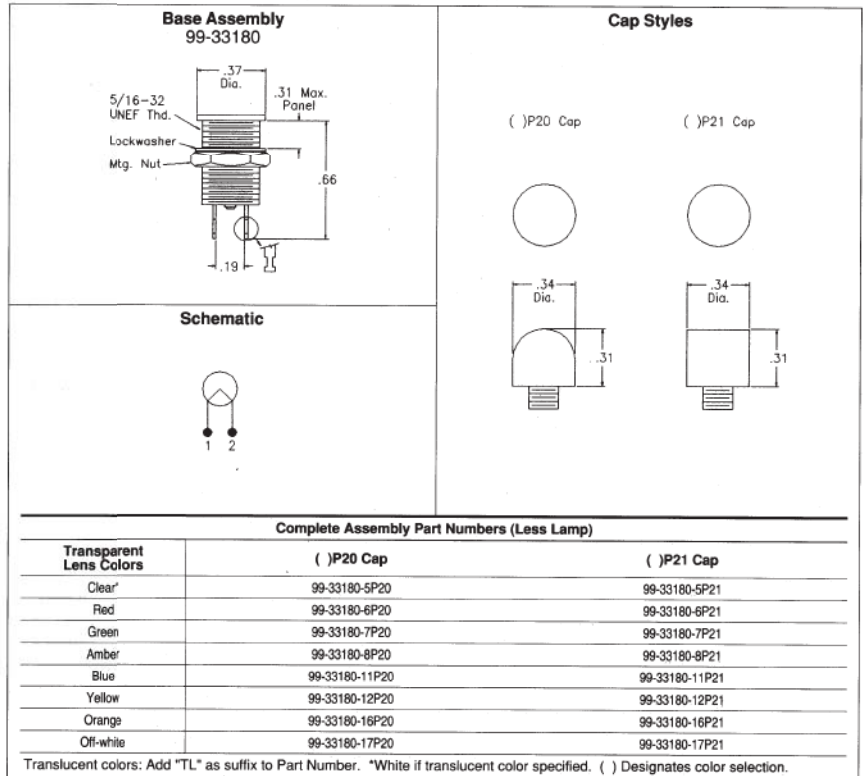
T-1 sub-midget flange base. See Lamp Selection Guide.
Choose from Group M.

Mounting

Assembly mounts from front of panel. All mounting hardware supplied.

Weight

Approximately .12 oz. less lamp.



Miniature, Neon

31-36180 Series 31-36280 Series (MS25257)



Material and Finishes

Mounting tube and nut, aluminum, black anodized per MIL-A-8625A. Lockwasher, stainless steel or steel, nickel plate. Brass terminals, tin plated per MIL-T-10727A.

Cap Assembly

Lens, high impact-resistant plastic per L-P-349. Standard colors are transparent.

Lamp

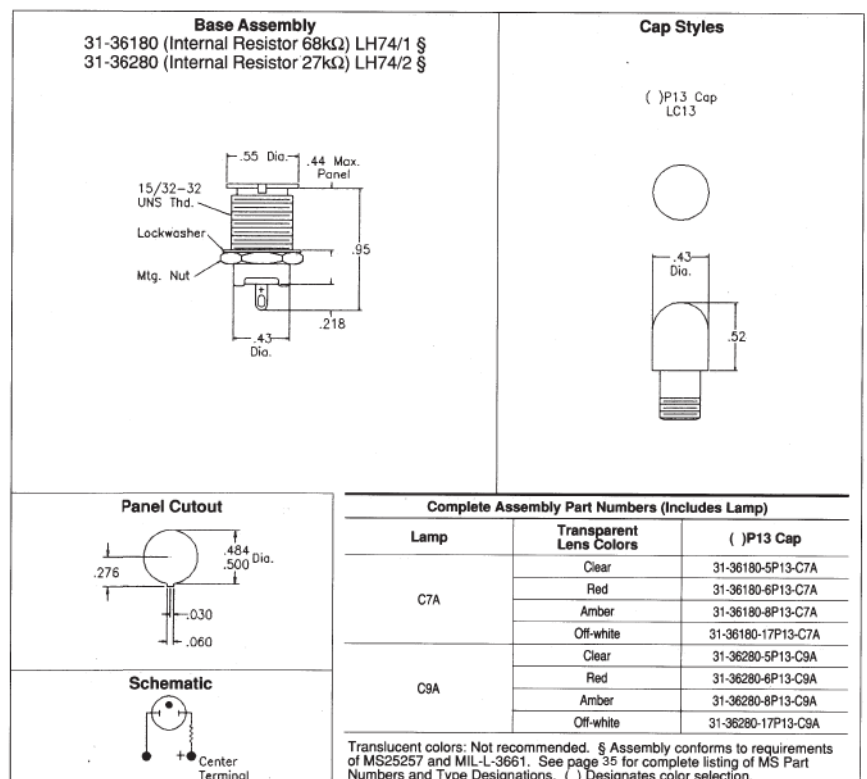
C7A (standard) or C9A (high brightness) T2 neon lamp furnished with each assembly. See Lamp Selection Guide for electrical characteristics.

Mounting

Assembly mounts from rear of panel. All mounting hardware supplied.

Weight

Approximately .3 oz. less lamp



Optolite Indicators General Purpose

INDICATOR LIGHTS



Miniature

11-33480 Type



Material and Finishes

Mounting tube and nuts, aluminum, black anodized per MIL-A-8625A. Lockwasher, stainless steel or steel, nickel plate. Brass terminals, tin plated per MIL-T-10727A.

Cap Assembly

Lens, high impact-resistant plastic per L-P-349.

Lamp

T-1 3/4 midget flange base.

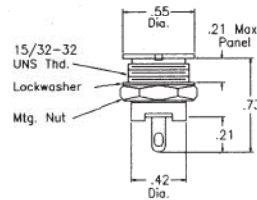
Mounting

Assembly mounts from front of panel. All mounting hardware supplied.

Weight

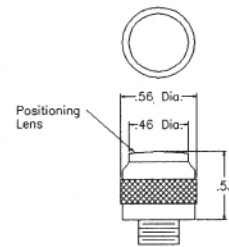
Approximately .2 oz. less lamp.

Base Assembly 11-33480 LH73/1 §

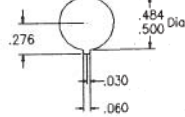


Cap Styles

() P35 Cap
LC11



Panel Cutout



Schematic



Complete Assembly Part Numbers (Less Lamp)

Transparent Lens Colors	() P35 Cap
Clear*	11-33480-5P35
Red	11-33480-6P35
Green	11-33480-7P35
Amber	11-33480-8P35
Blue	11-33480-11P35
Yellow	11-33480-12P35
Orange	11-33480-16P35
Off-white	11-33480-17P35

Translucent colors: Add "TL" as suffix to Part Number.
§ Assembly conforms to requirements of MIL-L-3661 and MS25256.
See page 35 for complete listing of MS Part Numbers and Type Designations.
*White if translucent color specified. () Designates color selection.

Miniature

59-52480 Type



Material and Finishes

Mounting tube and nuts, aluminum, black anodized per MIL-A-8625A. Lockwasher, stainless steel or steel, nickel plate. Brass terminals, tin plated per MIL-T-10727A.

Cap Assembly

Lens, high impact-resistant plastic per L-P-349.

Lamp

T-1 3/4 midget flange base.

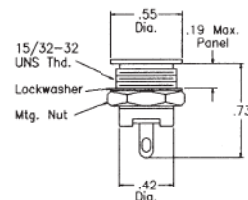
Mounting

Assembly mounts from rear of panel. All mounting hardware supplied.

Weight

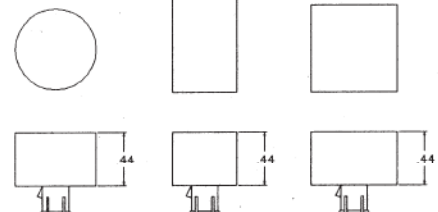
Approx. .2 oz. less lamp.

Base Assembly 59-52480



Cap Styles

Circular Rectangular Square



Schematic



Complete Assembly Part Numbers

To order complete assembly specify:

59-52480	- () -	()
Base Assembly	Cap Assembly (See page 8)	Lamp (See page 35)

Optolite Indicators General Purpose

INDICATOR LIGHTS



Miniature

14-30080 Type



Material and Finishes

Mounting tube and nuts, aluminum, black anodized per MIL-A-8625A. Lockwasher, stainless steel or steel, nickel plate. Brass terminals, tin plated per MIL-T-10727A.

Cap Assembly

Lens, high impact-resistant plastic per L-P-349. Lens holders, aluminum, black anodized.

Lamp

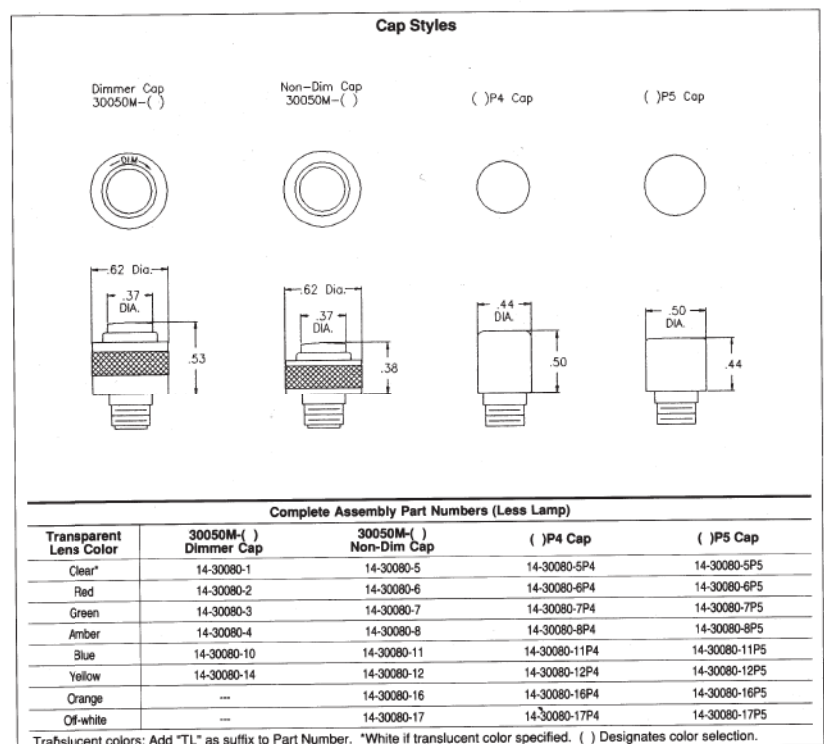
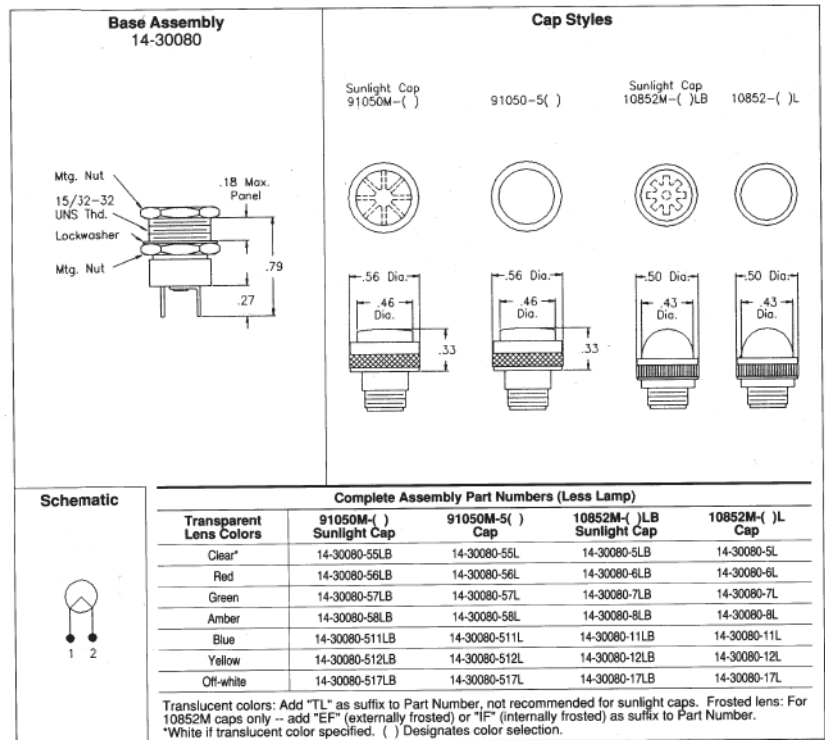
T-1 3/4 midget flange base.

Mounting

Assembly mounts from rear of panel. All mounting hardware supplied. Recommended mounting hole .500 in. +/- .015 in. dia.

Weight

Approx. .27 oz. less lamp.



Optolite Indicators General Purpose

INDICATOR LIGHTS



General Purpose



Material and Finishes

Mounting tube and nuts, aluminum, black anodized per MIL-A-8625A. Lockwasher, stainless steel or steel, nickel plate. Brass terminals, tin plated per MIL-T-10727A.

Cap Assembly

Lens, high impact-resistant plastic (nylon). Standard colors are semi-diffusing.

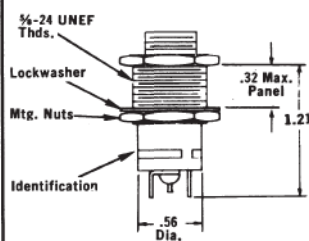
Lamp

T-3 3/4 miniature bayonet base.

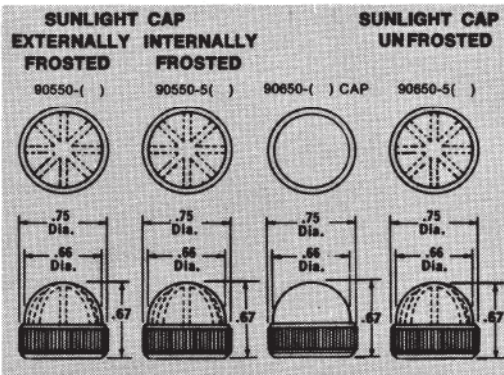
Mounting

Assembly mounts from rear of panel. All mounting hardware supplied. Recommended mounting hole .640 in. +/- .015 in. dia.

BASE ASSEMBLY 13-30080S



CAP STYLES



Complete Assembly Part Number (Less Lamp)				
Semi-Diffusing Lens Colors	90550 - () Sunlight Cap	90550 - 5() Sunlight Cap	90650 - () Cap	90650 - 5() Sunlight Cap
Lunar	13-VM309- 5	13-VM309- 55	13-VM305- 5	13-VM305- 55
Red	13-VM309- 6	13-VM309- 56	13-VM305- 6	13-VM305- 56
Green	13-VM309- 7	13-VM309- 57	13-VM305- 7	13-VM305- 57
Amber	13-VM309- 8	13-VM309- 58	13-VM305- 8	13-VM305- 58
Blue	13-VM309-11	13-VM309-511	13-VM305-11	13-VM305-511

() Designates color selection.

SCHEMATIC



Miniature, Neon



Material and Finishes

Mounting tube gold anodized, rear mtg. nut aluminum, black anodized per MIL-A-8625A. Lockwasher, stainless steel or steel, nickel plate. Terminals, brass, tin plated per MIL-T-10727A. Round front mtg. nut, bright nickel plate.

Cap Assembly

Lens, high impact-resistant plastic per L-P-349. Standard colors are transparent.

Lamp

A1G (std.) or A1H (high brightness) T-2 neon is furnished with each assembly.

Mounting

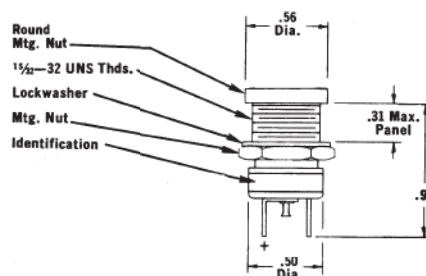
Assembly mounts from rear of panel. All mounting hardware supplied. Recommended mounting hole .500 in. +/- .015 in. dia.

Weight

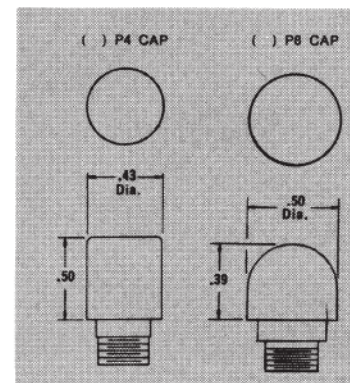
Approx. .35 oz. less lamp.

BASE ASSEMBLY

33-30880 (27K Ω Internal Resistor)
33-30881 (68K Ω Internal Resistor)



CAP STYLES



Complete Assembly Part Numbers (Includes Lamp)			
Lamp	Transparent Lens Color	() P4 Cap	() P8 Cap
A1H	Clear	33-30880-5P4-A1H	33-30880-5P8-A1H
	Red	33-30880-6P4-A1H	33-30880-6P8-A1H
	Amber	33-30880-8P4-A1H	33-30880-8P8-A1H
	Lunar	33-30880-17P4-A1H	33-30880-17P8-A1H
A1G	Clear	33-30881-5P4-A1G	33-30881-5P8-A1G
	Red	33-30881-6P4-A1G	33-30881-6P8-A1G
	Amber	33-30881-8P4-A1G	33-30881-8P8-A1G
	Lunar	33-30881-17P4-A1G	33-30881-17P8-A1G

Translucent colors: Not recommended.
() Designates color selection.

SCHEMATIC



Optolite Indicators General Purpose

Miniature



Material and Finishes

Mounting tube and nuts, aluminum, black anodized per MIL-A-8625A. Lockwasher, stainless steel or steel, nickel plate. Terminals 6-32 screws, nickel plate. Round front mounting nut, bright nickel plate.

Lamp

T-1 3/4 midget flange base.

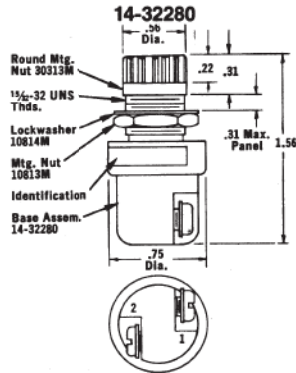
Mounting

Assembly mounts from rear of panel. All mounting hardware supplied. Recommended mounting hole .500 in. +/- .015 in. dia.

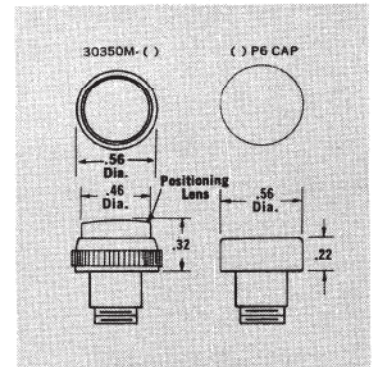
INDICATOR LIGHTS



BASE ASSEMBLY



CAP STYLES



Complete Assembly Part Numbers (Less Lamp)			
Transparent Lens Colors	() P10 Cap	() P6 Cap	30350M - () Cap
Clear*	14-32280-5P10	14-32280-5P6	14-32280-5
Red	14-32280-6P10	14-32280-6P6	14-32280-6
Green	14-32280-7P10	14-32280-7P6	14-32280-7
Amber	14-32280-8P10	14-32280-8P6	14-32280-8
Blue	14-32280-11P10	14-32280-11P6	14-32280-11
Yellow	14-32280-12P10	14-32280-12P6	14-32280-12
Lunar	14-32280-17P10	14-32280-17P6	14-32280-17

Translucent colors: add "TL" as suffix to Part No.
*White if translucent color specified.
() Designates color selection.

SCHEMATIC



Miniature



Material and Finishes

Mounting tube and nuts, aluminum, black anodized per MIL-A-8625A. Lockwasher, stainless steel or steel, nickel plate. Brass terminals, tin plated per MIL-T-10727A.

Cap Assembly

Lens, high impact-resistant plastic per L-P-349.

Lamp

T-1 3/4 midget flange base.

Mounting

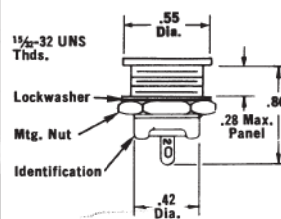
Assembly mounts from rear of panel. All mounting hardware supplied. Recommended mounting hole .500 in. +/- .015 in. dia.

Weight

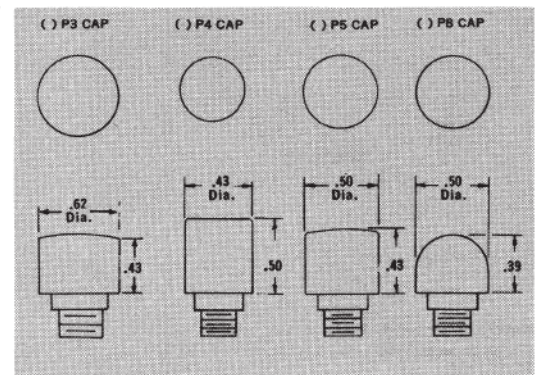
Approx. .2 oz. less lamp.

BASE ASSEMBLY

14-35180



CAP STYLES



Complete Assembly Part Numbers (Less Lamp)				
Transparent Lens Colors	() P3 Cap	() P4 Cap	() P5 Cap	() P8 Cap
Clear*	14-35180-5P3	14-35180-5P4	14-35180-5P5	14-35180-5P8
Red	14-35180-6P3	14-35180-6P4	14-35180-6P5	14-35180-6P8
Green	14-35180-7P3	14-35180-7P4	14-35180-7P5	14-35180-7P8
Amber	14-35180-8P3	14-35180-8P4	14-35180-8P5	14-35180-8P8
Blue	14-35180-11P3	14-35180-11P4	14-35180-11P5	14-35180-11P8
Yellow	14-35180-12P3	14-35180-12P4	14-35180-12P5	14-35180-12P8
Orange	14-35180-16P3	14-35180-16P4	14-35180-16P5	14-35180-16P8
Lunar	14-35180-17P3	14-35180-17P4	14-35180-17P5	14-35180-17P8

Translucent colors: Add "TL" as suffix to Part No.
*White if translucent color specified.
() Designates color selection.

SCHEMATIC



Optolite Indicators Watertight

INDICATOR LIGHTS



Sub-Miniature, Watertight

95-33180 Series



Material and Finishes

Mounting tube, black glass filled nylon per MIL-M-19887.
Mounting nut, aluminum, black anodized per MIL-A-8625A.
Lockwasher, stainless steel or steel, nickel plate. Brass terminals, tin plated per MIL-T-10727A.

Cap Assembly

Lens, high impact-resistant plastic per L-P-349. Standard colors are transparent.

Lamp

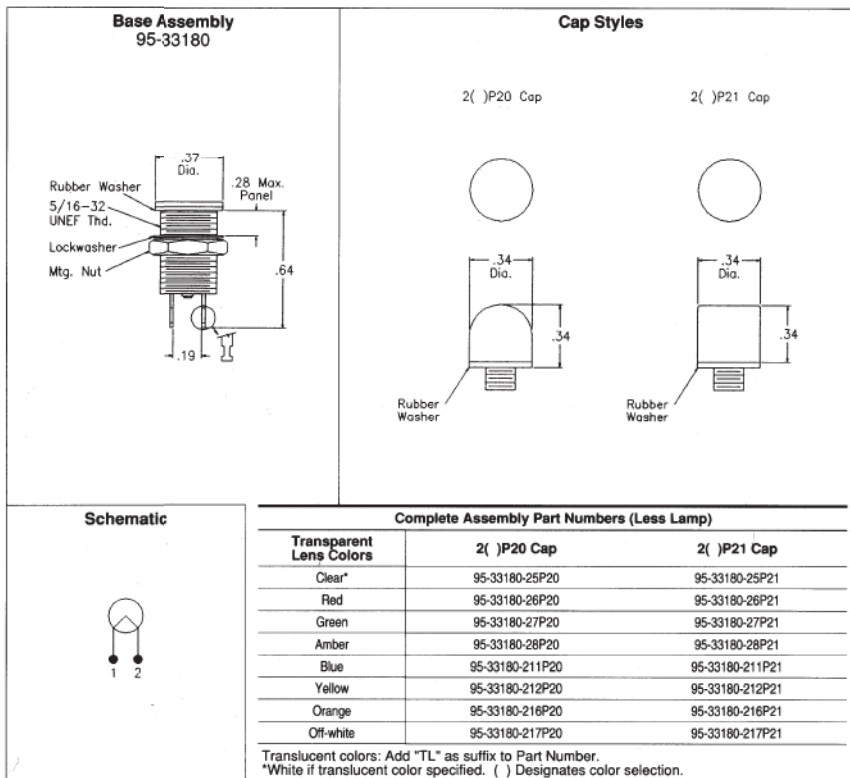
T-1 sub-midget flange base.

Mounting

Assembly mounts from front of panel. All mounting hardware supplied.

Weight

Approx. .12 oz. less lamp.



Miniature, Neon Watertight

31-36680 Series 31-36681 Series



Material and Finishes

Mounting tube and nuts, aluminum, black anodized per MIL-A-8625A. Lockwasher, stainless steel or steel, nickel plate. Brass terminals, tin plated per MIL-T-10727A. "O" ring, silicone rubber.

Cap Assembly

Lens, high impact-resistant plastic per L-P-349. Standard colors are transparent.

Lamp

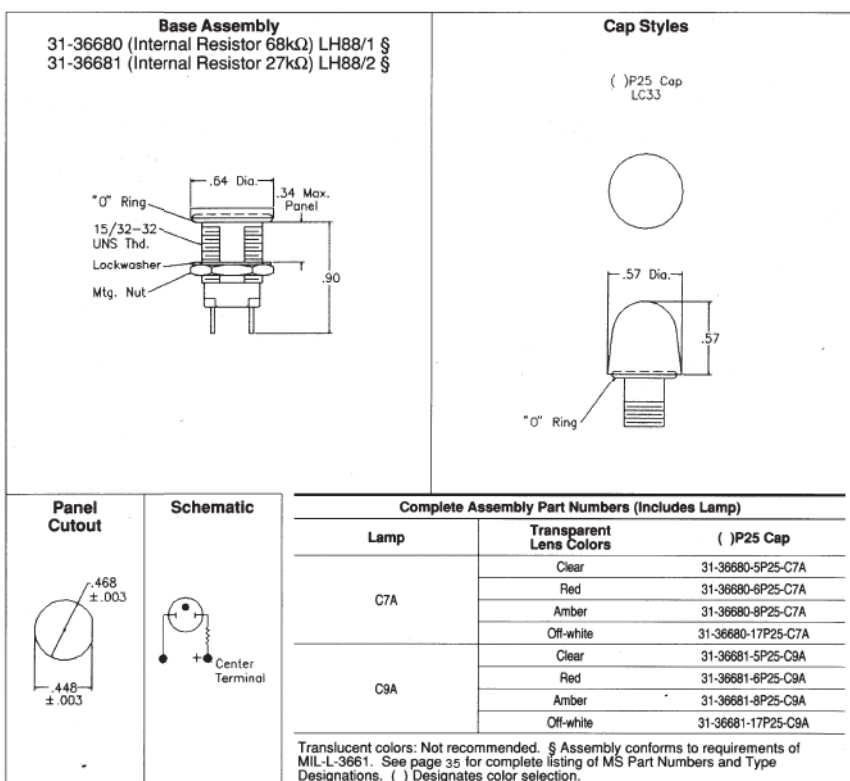
C7A (std.) or C9A (high brightness) T2 neon lamp is furnished with each assembly.

Mounting

Assembly mounts from front of panel. All mounting hardware supplied.

Weight

Approx. .3 oz. less lamp.



Optolite Indicators Watertight

INDICATOR LIGHTS



Miniature, Watertight

11-35182 Series



Material and Finishes

Mounting tube, aluminum, black anodized per MIL-A-8625A. Mounting nut, steel cad plate per QQ-P-416. Lockwasher, stainless steel or steel, nickel plate. Brass terminals, tin plated per MIL-T-10727A. "O" ring, silicone rubber.

Cap Assembly

Lens, high impact-resistant plastic per L-P-349.

Lamp

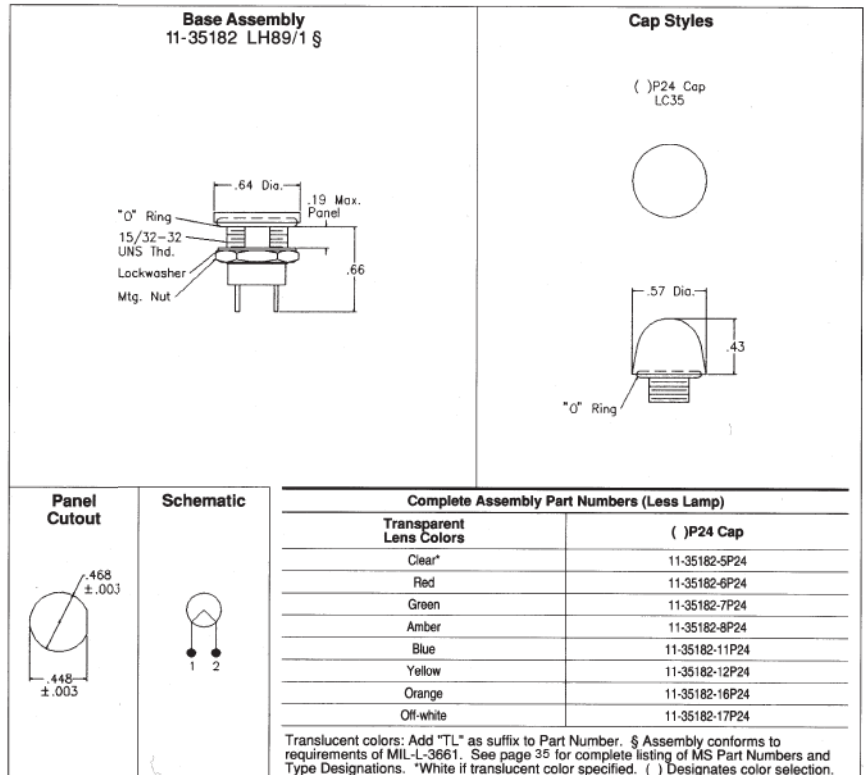
T-1 3/4 midget flange base.

Mounting

Assembly mounts from front of panel. All mounting hardware supplied.

Weight

Approx. .3 oz. less lamp.



Miniature, Watertight

15-30083 Series



Material and Finishes

Mounting tube and nuts, aluminum, black anodized per MIL-A-8625A. Lockwasher, stainless steel. Brass terminals, tin plated per MIL-T-10727A. Rubber boot and washer, silicone rubber.

Cap Assembly

Lens, high impact-resistant plastic per L-P-349. Lens holders, aluminum, black anodized.

Lamp

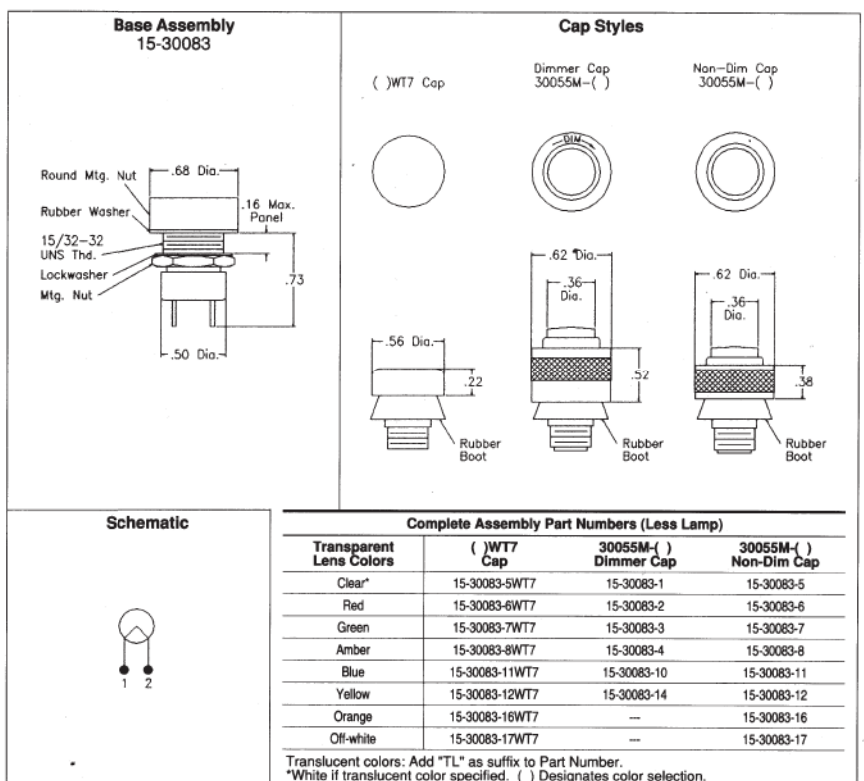
T-1 3/4 midget flange base. See Lamp Selection Guide. Choose from Group A.

Mounting

Assembly mounts from rear of panel. All mounting hardware supplied. Recommended mounting hole .500 in. ±.015 in. dia.

Weight

Approximately .3 oz. less lamp.



Optolite Indicators Watertight

INDICATOR LIGHTS



Miniature, Watertight

VM-700 Type
Incandescent Vaportight
Size T-3 1/4



Cap

Transparent plastic with O-ring. If translucent cap is desired, add "TL" to final dash number

Base Assembly

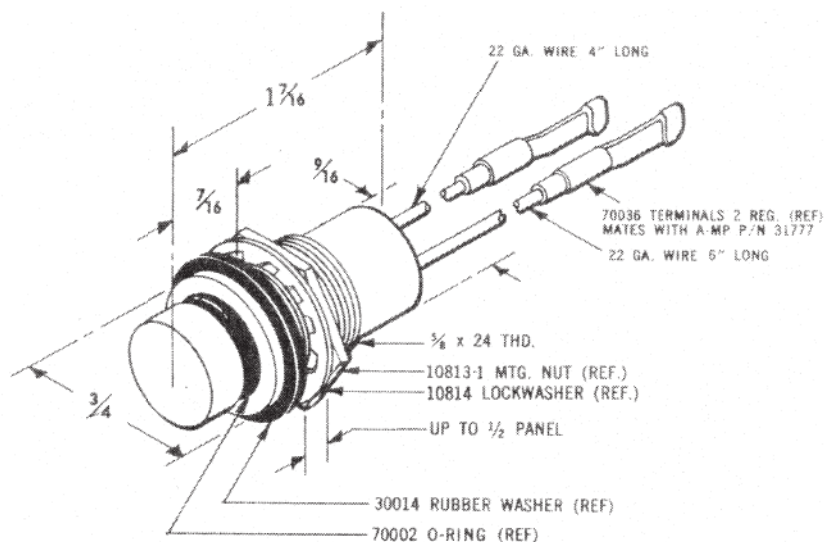
Aluminum - standard finish is bright anodized

Light Assembly

Completely sealed and will withstand immersion in liquid

Weight

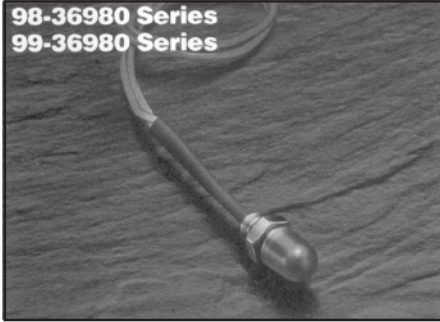
Approx. 1 oz., less lamp



Optolite Indicators E.M.I. Supressed

Sub-Miniature, Optional E.M.I. Suppression

98-36980 Series 99-36980 Series



Material and Finishes

Mounting tube and nut, stainless steel, passivated per MIL-S-5002. Wire leads #26 GA silver coated, stranded copper with TFE-fluorocarbon insulation.

Lens Assembly

Lens, high impact-resistant plastic per L-P-393 (polycarbonate).

Lamp

MS24367-683 subminiature T-1 with 5.0V at .060 amp rating (non-replaceable).

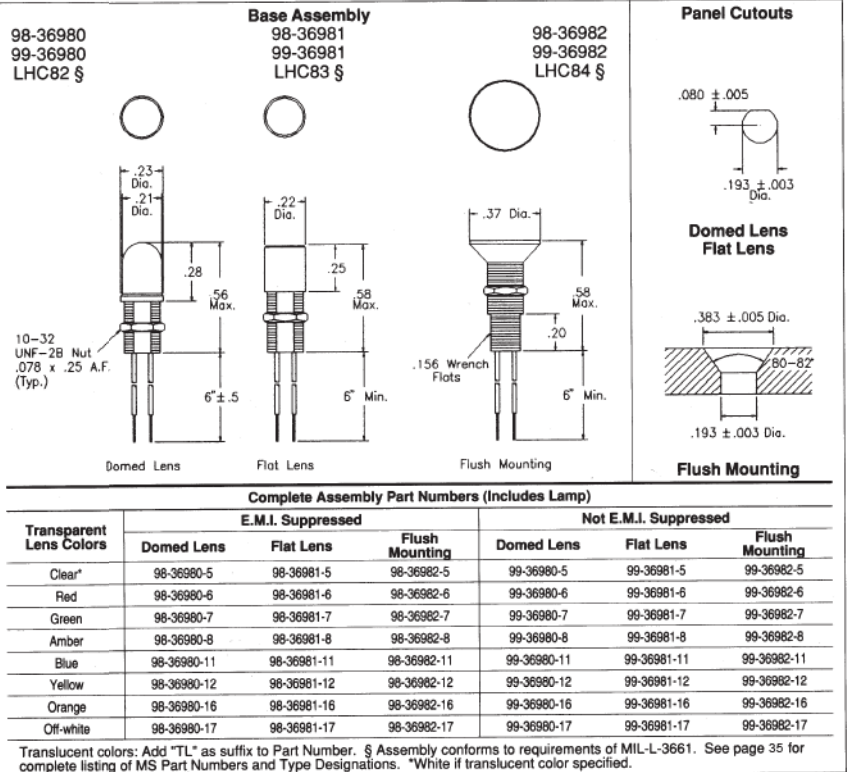
Mounting

Assembly mounts from front of panel. All mounting hardware supplied. E.M.I. suppressed assemblies require paint free area on back side of mounting for E.M.I. conductivity.

Weight

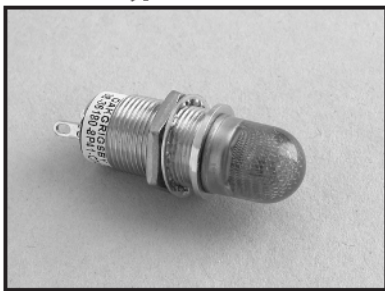
Approx. .005 lbs. max.

INDICATOR LIGHTS



Miniature, Neon E.M.I. Suppressed

38-36180 Type



Material and Finishes

Mounting tube and nuts, brass plated, nickel plated per QQ-N-290. Lockwasher, stainless steel or steel, nickel plate. Brass terminals, tin plated per MIL-T-10727A.

Cap Assembly

Lens, high impact-resistant plastic per L-P-349. Standard colors are transparent.

Lamp

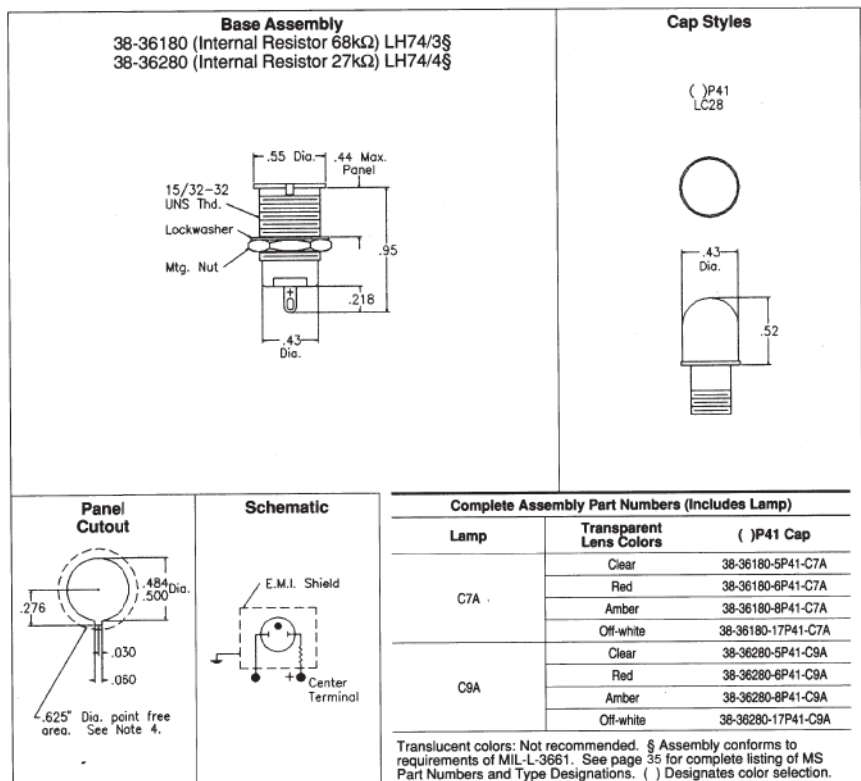
C7A (std.) or C9A (high brightness) T2 neon lamp is furnished with each assembly.

Mounting

Assembly mounts from front of panel. All mounting hardware supplied. Recommended mounting hole .500 in. +/- .015 in. dia. Paint free area around backside hole required for E.M.I. conductivity.

Weight

Approx. .3 oz. less lamp.



Optolite Indicators E.M.I. Supressed

INDICATOR LIGHTS



Miniature, E.M.I. Suppressed

18-36880 Type



Material and Finishes

Mounting tube and nut, brass, bright nickel finish. Lockwasher stainless steel or steel nickel plate. Brass terminals, tin plated per MIL-T-10727A. "O" ring, silicone rubber.

Cap Assembly

Lens, high impact-resistant plastic per L-P-349 Lens holders, brass, bright nickel plated.

Lamp

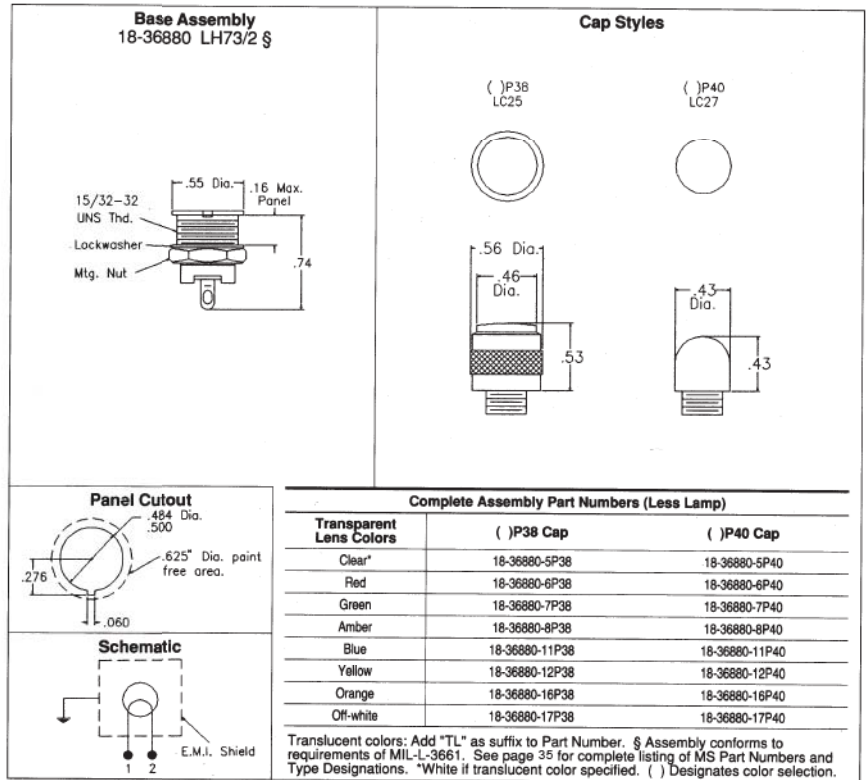
T-1 3/4 midget flange base.

Mounting

Assembly mounts from front of panel. All mounting hardware supplied. Recommended mounting hole .500 in. $\pm$.015 in. dia. Paint free area around back side of hole required for E.M.I. conductivity.

Weight

Approximately .35 oz. less lamp.



Miniature, E.M.I. Suppressed, Watertight

18-36680 Type



Material and Finishes

Mounting tube and exposed hardware, brass, bright nickel plate per QQ-N-290. Lockwasher, stainless steel or steel, nickel plate. Terminals, brass, tin plated per MIL-T-10727A.

Cap Assembly

Lens is high impact-resistant plastic per L-P-349.

Lamp

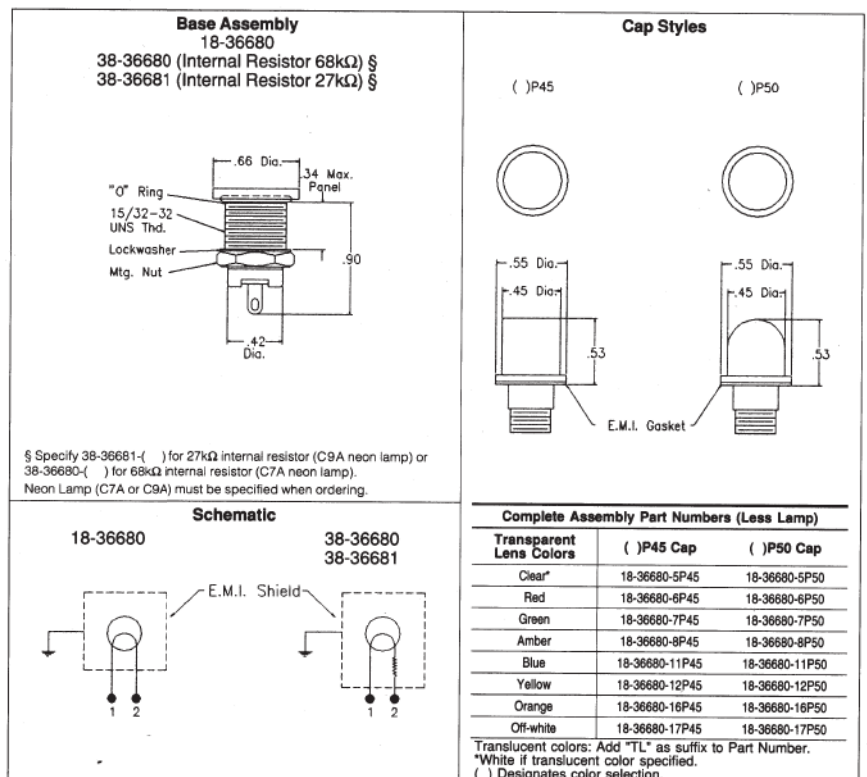
T-1 3/4 midget flange base.

Mounting

Assembly mounts from front of panel. All mounting hardware supplied. E.M.I. suppressed assemblies require paint free area on back side of mounting hole for E.M.I. conductivity.

Weight

Approx. .35 oz less lamp.



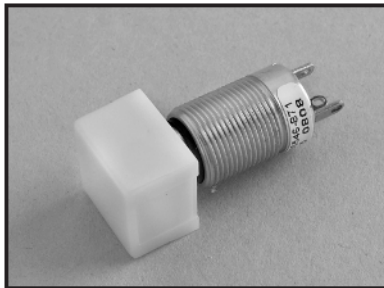
Optolite Indicators Press-to-Test

INDICATOR LIGHTS



Miniature, Optional Press-to-Test

59-52280 Type



Material and Finishes

Mounting tube and knurled nut, clear anodized per MIL-A-8625A. Mounting nut and key washer, brass, nickel plate. Lockwasher, stainless steel or steel, nickel plate, Brass terminals, tin plated per MIL-T-10727A.

Cap Assembly

Lens, high impact-resistant plastic per L-P-349. Friction fit lens caps, rotatable or keyed. Uses Presslite friction cap pushbuttons.

Lamp

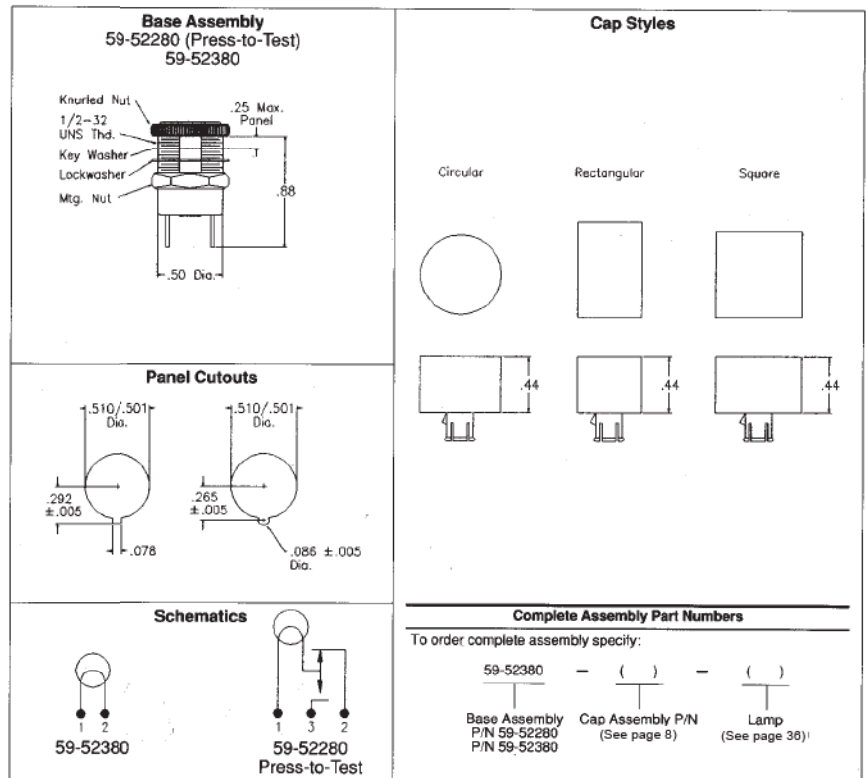
T-1 3/4 midget flange base.

Mounting

Assembly mounts from rear of panel. All mounting hardware supplied. Recommended mounting hole, see drawing.

Weight

Approximately .5 oz. less lamp.



Miniature, Press-to-Test

01-91180 Type



Material and Finishes

Mounting tube and nuts, aluminum, black anodized per MIL-A-8625A. Lockwasher, stainless steel. Brass terminals, tin plated per MIL-T-10727A.

Cap Assembly

Lens, high impact-resistant plastic per L-P-349, NVG Green, flat glass lens. Lens holders, aluminum, black anodized.

Lamp

T-1 3/4 midget flange base.

Mounting

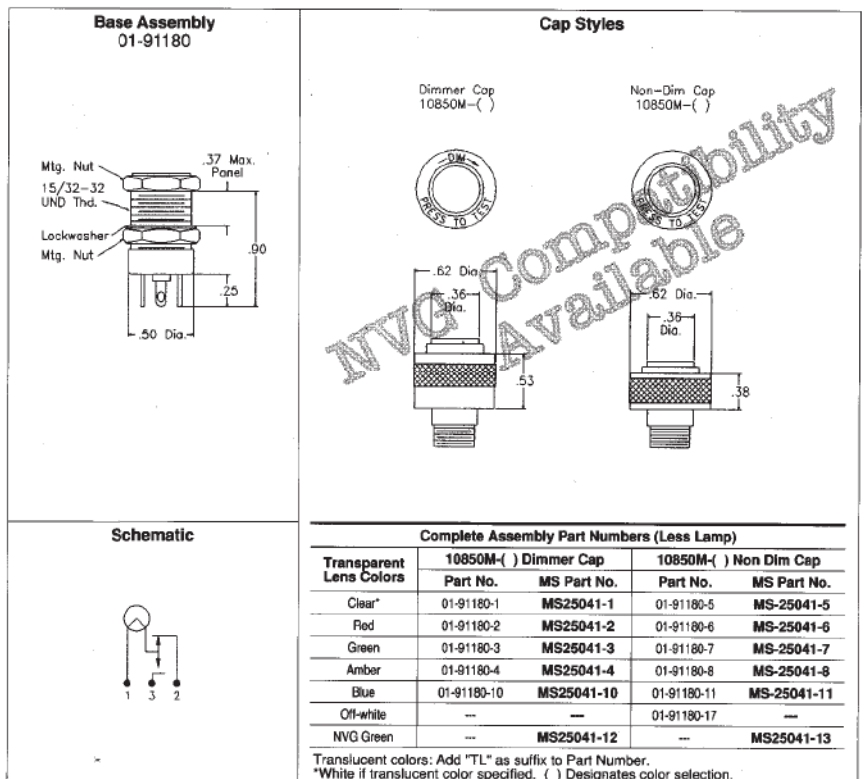
Assembly mounts from rear of panel. All mounting hardware supplied. Recommended mounting hole .500 in. ±.015 dia.

Identification

Identified with MS P/N and base assembly number.

Weight

Approximately .5 oz. less lamp.



Optolite Indicators Press-to-Test

INDICATOR LIGHTS



Standard Size Press-to-Test

02-91180 Type



Material and Finishes

Mounting tube and nuts, aluminum, black anodized per MIL-A-8625A. Lockwasher, stainless steel. Brass terminals, tin plated per MIL-T-10727A.

Cap Assembly

Lens is high impact-resistant plastic per L-P-349. Lens holders, aluminum, black anodized.

Lamp

T-3 1/4 miniature bayonet base.

Mounting

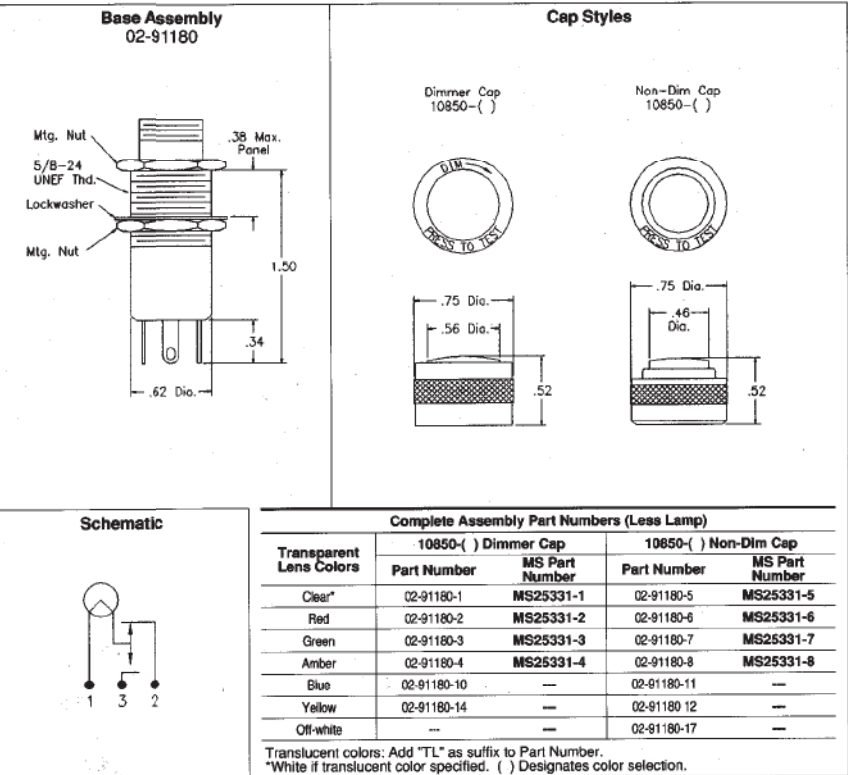
Assembly mounts from rear of panel. All mounting hardware supplied. Recommended mounting hole .640 in. $\pm$.015 in. dia.

Identification

Identified with MS P/N and base assembly number

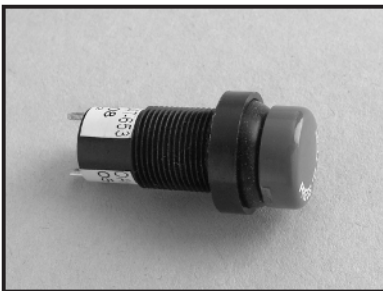
Weight

Approximately .8 oz. less lamp.



Miniature, Watertight, Press-to-Test

05-90880 Type



Material and Finishes

Mounting tube, black glass filled nylon per MIL-M-19887. Mounting nut aluminum, black anodized per MIL-A-8625A. Lockwasher, stainless steel or steel, nickel plate. Brass terminals, tin plated per MIL-T-10727A. Rubber boot and washer, silicone rubber.

Cap Assembly

Lens, high impact-resistant plastic per L-P-349. Lens holders are aluminum, black anodized.

Lamp

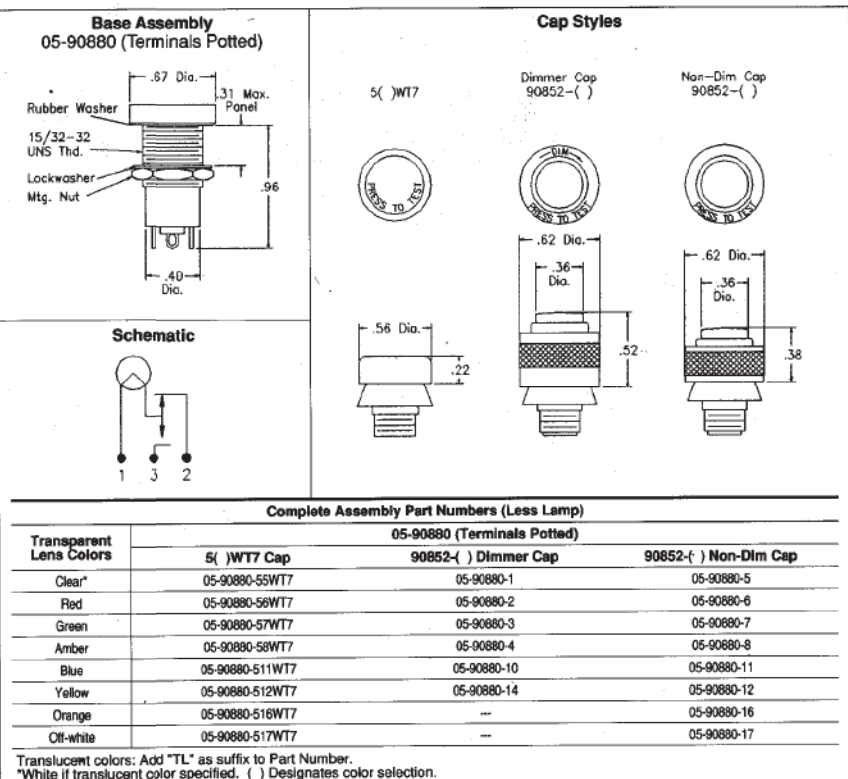
T-1 3/4 midget flange base.

Mounting

Assembly mounts from front of panel. All mounting hardware supplied. Recommended mounting hole .500 in. $\pm$.015 in. dia.

Weight

Approx. .3 oz. less lamp.



Optolite Indicators Press-to-Test

INDICATOR LIGHTS



Miniature, Watertight Press-to-Test

05-91182 Type



Material and Finishes

Mounting tube and nuts, aluminum, black anodized per MIL-A-8625A. Lockwasher, stainless steel or steel, nickel plate. Brass terminals, tin plated per MIL-T-10727A. Rubber boot and washer, silicone rubber.

Cap Assembly

Lens, high impact-resistant plastic per L-P-349. Lens holders are aluminum, black anodized.

Lamp

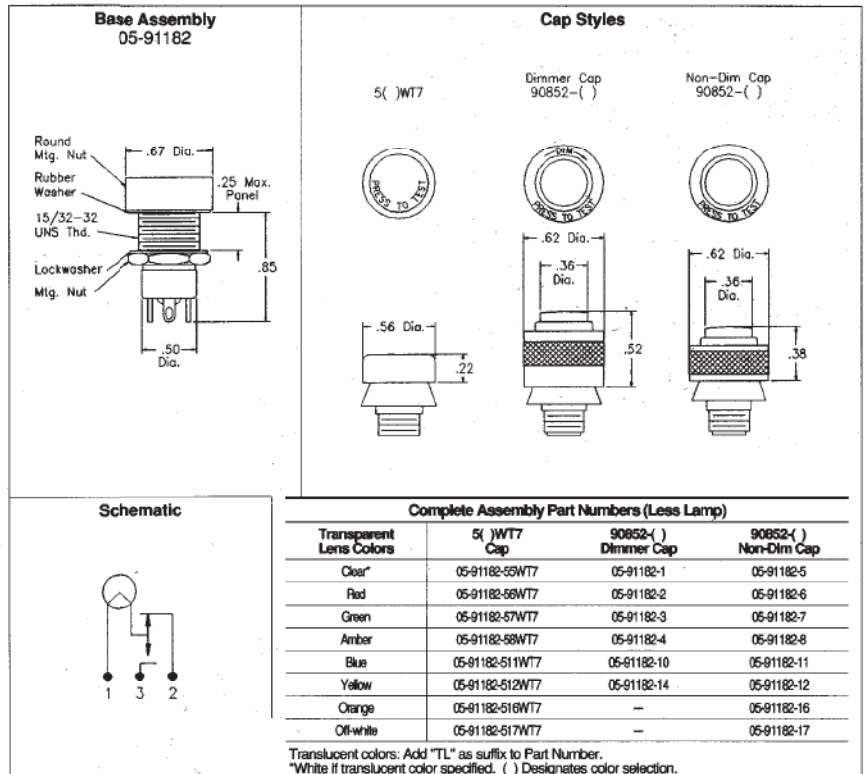
T-1 3/4 midjet flange base.

Mounting

Assembly mounts from rear of panel. All mounting hardware supplied. Recommended mounting hole .500 in. $\pm$.015 in. dia.

Weight

Approximately .44 oz. less lamp.



Watertight, Press-to-Test

06-91182 Type



Material and Finishes

Mounting tube and nuts, aluminum, black anodized per MIL-A-8625A. Lockwasher, stainless steel or steel, nickel plate. Brass terminals, tin plated per MIL-T-10727A. Rubber boot and washer, silicone rubber.

Cap Assembly

Lens, high impact-resistant plastic per L-P-349. Lens holders, aluminum, black anodized.

Lamp

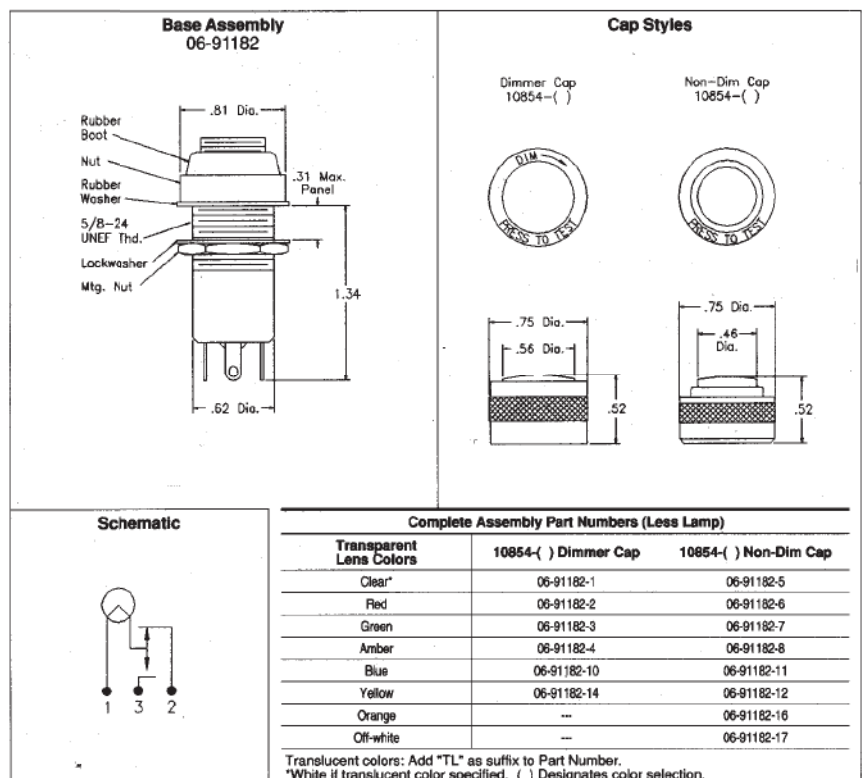
T-3 1/4 miniature bayonet base.

Mounting

Assembly mounts from rear of panel. All mounting hardware supplied. Recommended mounting hole .640 in. $\pm$.015 in. dia.

Weight

Approximately .85 oz. less lamp.



Optolite Indicators Press-to-Test

INDICATOR LIGHTS



Miniature, Press-to-Test



Material and Finishes

Mounting tube, black glass filled nylon per MIL-M-19887.
Mounting nut aluminum, black anodized per MIL-A-8625A.
Lockwasher, stainless steel or steel, nickel plate. Brass terminals, tin plated per MIL-T-10727A.

Cap Assembly

Lens, high impact-resistant plastic per L-P-349. Lens holders are aluminum, black anodized.

Lamp

T-1 3/4 midget flange base.

Mounting

Assembly mounts from front of panel. All mounting hardware supplied. Recommended mounting hole .500 in. +/- .015 in. dia.

Weight

Approx. .9 oz. less lamp.

General Purpose, Press-to-Test



Material and Finishes

Mounting tube, aluminum, black anodized per MIL-A-8625A.
Mounting nut, steel cad plate per QQ-P-416. Lockwasher, stainless steel or steel, nickel plate. Brass terminals, tin plated per MIL-T-10727A.

Cap Assembly

Lens, high impact-resistant plastic per L-P-349. Standard colors are semi-diffusing.

Lamp

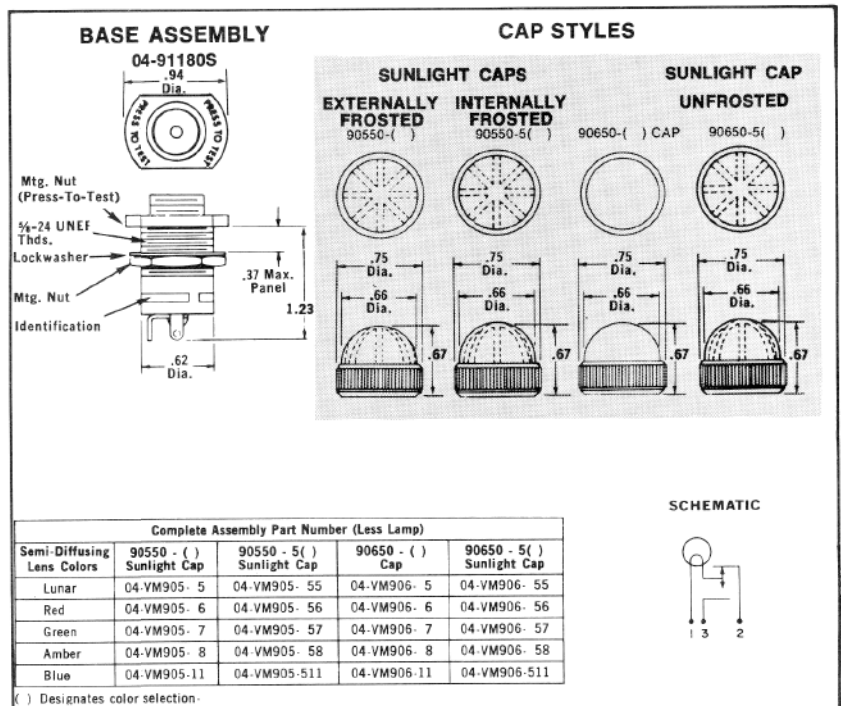
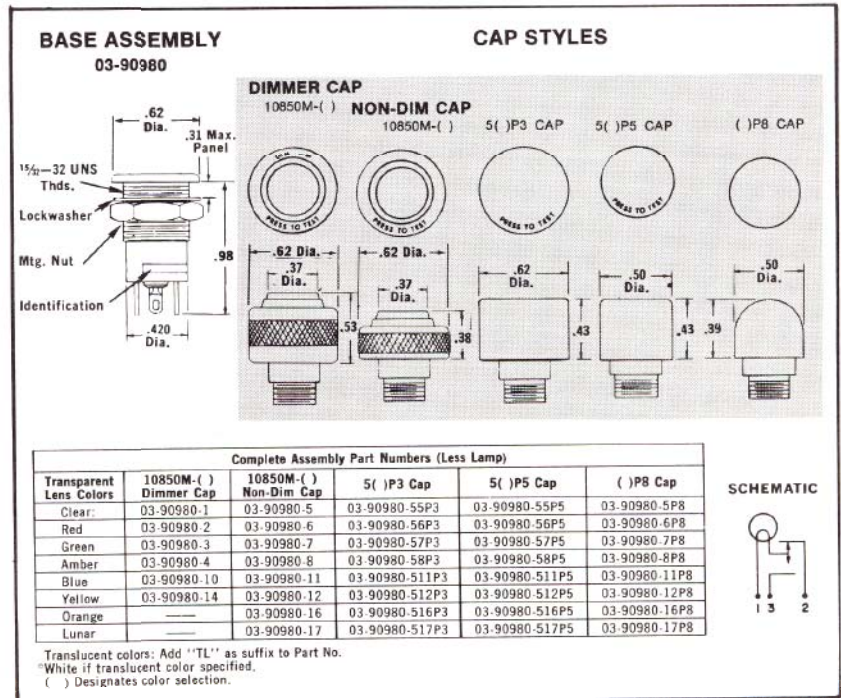
T-3 1/4 miniature bayonet base.

Mounting

Assembly mounts from front of panel. All mounting hardware supplied. Recommended mounting hole .640 in. +/- .015 in. dia.

Weight

Approx. .55 oz. less lamp.



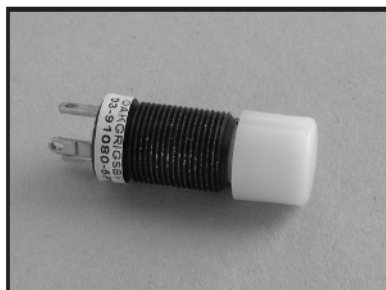
Optolite Indicators Press-to-Test

INDICATOR LIGHTS



Miniature, Press-to-Test

03-91080 Type



Material and Finishes

Mounting tube and nuts, aluminum, black anodized per MIL-A-8625A. Lockwasher, stainless steel. Brass terminals, tin plated per MIL-T-10727A.

Cap Assembly

Lens, high impact-resistant plastic per L-P-349.

Lamp

T-1 3/4 midget flange base. See Lamp Selection Guide.

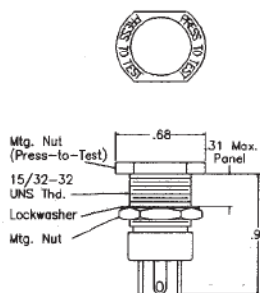
Mounting

Assembly mounts from rear of panel. All mounting hardware supplied. Recommended mounting hole .500 in. ± 0.015 in. dia.

Weight

Approximately .4 oz. less lamp.

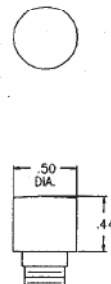
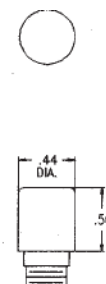
Base Assembly
03-91080



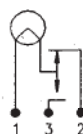
Cap Styles

()P4 Cap

()P5 Cap



Schematic



Complete Assembly Part Numbers (Less Lamp)

Transparent Lens Colors	()P4 Cap	()P5 Cap
Clear*	03-91080-5P4	03-91080-5P5
Red	03-91080-6P4	03-91080-6P5
Green	03-91080-7P4	03-91080-7P5
Amber	03-91080-8P4	03-91080-8P5
Blue	03-91080-11P4	03-91080-11P5
Yellow	03-91080-12P4	03-91080-12P5
Orange	03-91080-16P4	03-91080-16P5
Off-white	03-91080-17P4	03-91080-17P5

Translucent colors: Add "TL" as suffix to Part Number.

*White if translucent color specified. () Designates color selection.

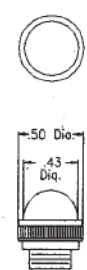
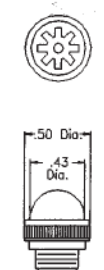
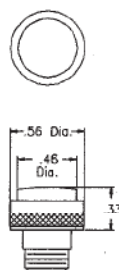
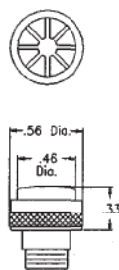
Cap Styles

Sunlight Cap
91050M-()

91050-5()

Sunlight Cap
10852M-()LB

10852-()L



Complete Assembly Part Numbers (Less Lamp)

Transparent Lens Colors	91050M-() Sunlight Cap	91050M-5() Cap	10852M-()LB Sunlight Cap	10852M-()L Cap
Clear*	03-91080-5	03-91080-55	03-91080-5LB	03-91080-5L
Red	03-91080-6	03-91080-56	03-91080-6LB	03-91080-6L
Green	03-91080-7	03-91080-57	03-91080-7LB	03-91080-7L
Amber	03-91080-8	03-91080-58	03-91080-8LB	03-91080-8L
Blue	03-91080-11	03-91080-511	03-91080-11LB	03-91080-11L
Yellow	03-91080-12	03-91080-512	03-91080-12LB	03-91080-12L
Off-white	03-91080-17	03-91080-517	03-91080-17LB	03-91080-17L

Translucent colors: Add "TL" as suffix to Part Number, not recommended for sunlight caps.

Frosted lens: For 10852M caps only--Add "EF" (externally frosted) or "IF" (internally frosted) as suffix to Part Number.

*White if translucent color specified. () Designates color selection.

Optolite Indicators Press-to-Test

INDICATOR LIGHTS



Miniature, E.M.I. Supressed Watertight, Press-to-Test

08-83283 Type



Material and Finishes

Round mounting nut, aluminum, black anodized per MIL-A-8625A. Mounting tube and mounting nut, bright nickel plated per QQ-N-290. Lockwasher, steel, nickel plated. Rubber boot and washer, silicone rubber Brass terminals, gold plated per MIL-G-45204.

Cap Assembly

Lens, high impact-resistant plastic per L-P-349. Lens holders, aluminum, black anodized.

Lamp

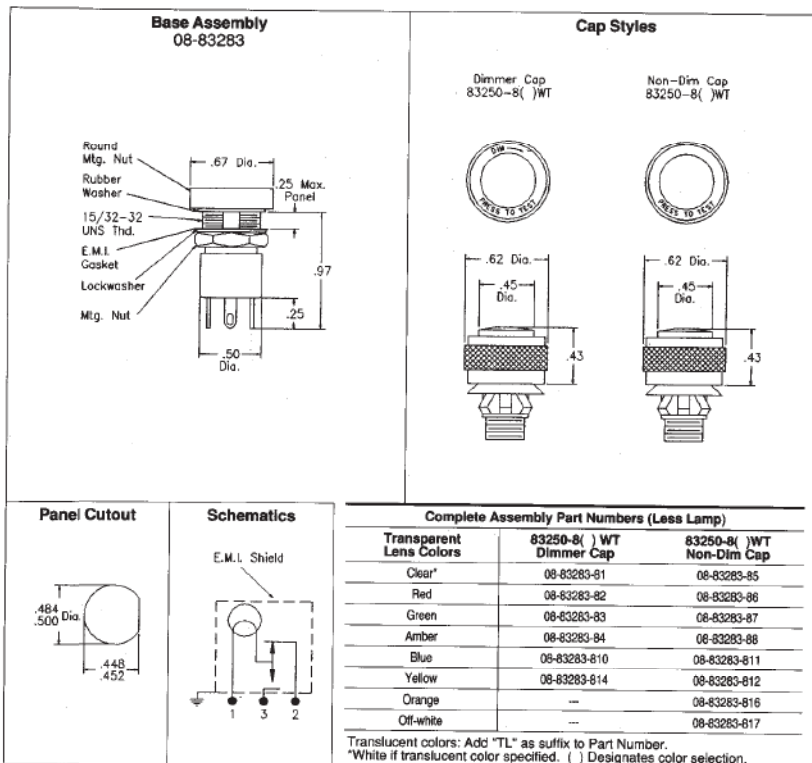
T-1 3/4 midget flange base.

Mounting

Assembly mounts from rear of panel. All mounting hardware supplied. Flat on mounting tube provides for keyed installation.

Weight

Approximately .6 oz. less lamp.



Miniature, E.M.I. Supressed Watertight, Press-to-Test

08-83281 Type



Material and Finishes

Lens holder and front mounting nut is black anodized per MIL-A-8625A. Mounting tube & rear Mtg. nut, is bright nickel plated per QQ-N-200. Lockwasher is stainless steel. Terminals brass, gold plated per MIL-G-45204.

Cap Assembly

Lens is high impact-resistant plastic per L-P-349. Lens holders are aluminum, black anodized.

Lamp

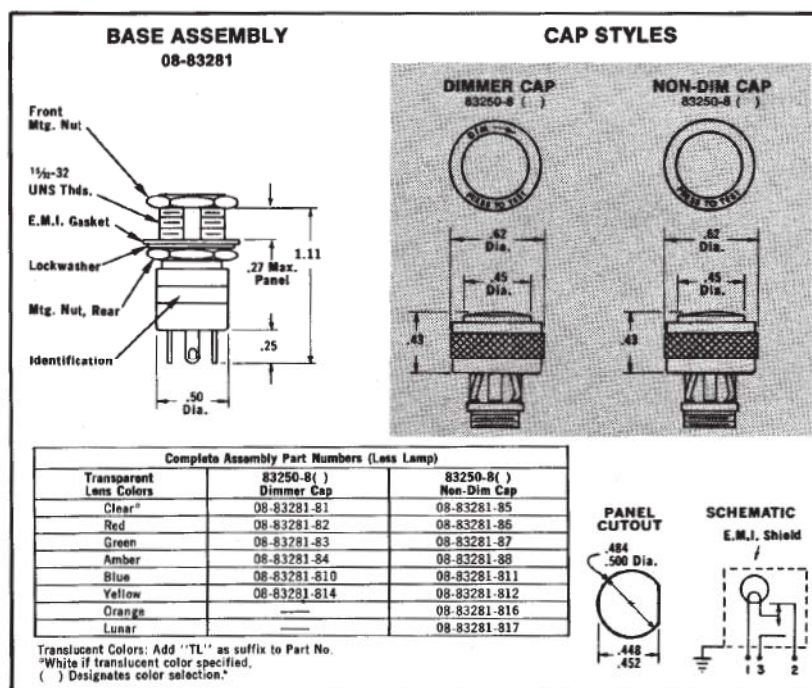
T-1 3/4 midget flange base.

Mounting

Assembly mounts from rear of panel. All mounting hardware supplied. Flat on Mtg. tube provides for keyed installation.

Weight

Approx. .5 oz less lamp.



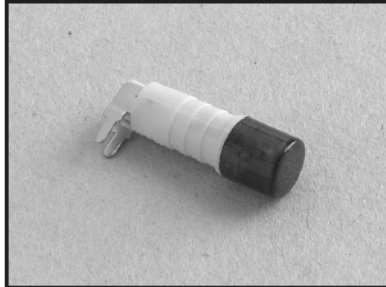
Optolite Indicators Push-In

INDICATOR LIGHTS



Sub-Miniature "Little QT"

99-33080 Type
99-33081 Type



Material and Finishes

Housing and lamp base, gray glass filled nylon. Terminals, beryllium copper, gold flashed. Retainer clip, stainless steel.

Lens Cap

High impact-resistant plastic per L-P-393 (polycarbonate).

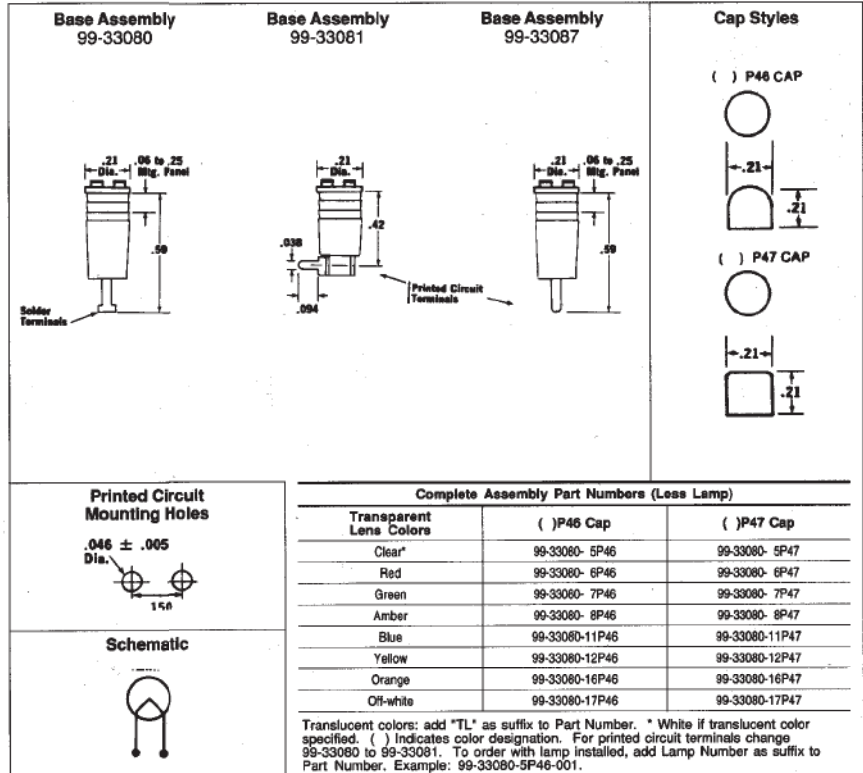
Lamp

T-1 wire terminal lamp; Lamp is replaced by removing snap-on cap.

Mounting

Press-in: Assembly press fits into .189 in. dia. hole. No mounting hardware required.

Retainer clip: For mounting assembly into .200 in. $\pm$.005 in. dia. hole or panels less than .06 in. thick. Order clip 2-1186-643 separately.



"Little QT" Lamps

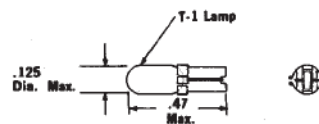


Lamp Bases

Color coded for operating voltage as follows:

Blue	1.5 volts
Yellow	3.0 volts
Black	5.0 volts
Green	10.0 volts
Gray	120 volts
Purple	14.0 volts
White	18.0 volts
Red	28.0 volts AC

Lamp Drawing



Little QT Lamp Selection

Lamp Number	Volts	Amps	MSCP	Average Life (Hrs.)	ANSI Number (Ref.)
003	1.5	.060	.02	50,000+	7202
004	1.5	.075	.03	16,000+	7203
005	3.0	.060	.03	100,000	7207
006	3.0	.120	.15	16,000	7208
007	3.0	.008	.01	16,000	7204
008	5.0	.015	.02	10,000	7209
009	5.0	.060	.05	100,000	683
010	5.0	.075	.09	25,000	713
012	5.0	.115	.20	5,000	7213
013	5.0	.060	.03	100,000	680
014	5.0	.115	.19	10,000	7215
015	5.0	.125	.25	5,000	7216
024	5.0	.115	.15	40,000	715
025	5.0	.060	.15	6,500	6150
016	10.0	.027	.10	10,000	7218
017	12.0	.060	.15	16,000+	7219
027	14.0	.040	.15	16,000	23
018	18.0	.026	.15	10,000	7220
022	28.0	.024	.15	16,000+	6838

Cross Reference

INDICATOR LIGHTS



Cross Reference to Military Type Designations		
Specification	Type Designation	Electroswitch Part Number
MIL-L-3661/5	LH 73/1	11-33480
	LH 73/2	18-36880
	LH 74/1	31-36180
	LH 74/2	31-36280
MIL-3661/6	LH 74/3	38-36180
	LH 74/4	38-36280
	LC 11 RN2	6P35
	LC 11 GN2	7P35
	LC 11 YN2	8P35
	LC 11 CN2	5P35
	LC 11 RT2	6P35TL
	LC 11 GT2	7P35TL
	LC 11 YT2	12P35TL
	LC 11 WT2	5P35TL
	LC 11 GD2	7P35IF
	LC 11 RD2	6P35IF
	LC 11 RB2	46P35
	LC 11 GB2	47P35
	LC 11 YB2	412P35
	LC 11 WB2	45P35
MIL-L-3661/11	LC 13 RN2	6P13
	LC 13 YN2	8P13
	LC 13 WT2	17P13
	LC 13 CN2	5P13
MIL-L-3661/13	LC 13 GT2	7P13TL
	LC 25 RN2	6P38
	LC 25 GN2	7P38
	LC 25 YN2	8P38
MIL-L-3661/25	LC 25 CN2	5P38
	LC 25 RT2	6P38TL
	LC 25 GT2	7P38TL
	LC 25 YT2	12P38TL
	LC 25 WT2	5P38TL
	LC 27 RN2	6P40
	LC 27 YN2	8P40
	LC 27 CN2	5P40
MIL-L-3661/27	LC 27 RT2	6P40TL
	LC 27 GT2	7P40TL
	LC 27 YT2	12P40TL
	LC 27 WT2	5P40TL
	LC 27 GN2	7P40
MIL-L-3661/28	LC 28 RN2	6P41
	LC 28 YN2	8P41
	LC 28 WT2	17P41
	LC 28 CN2	5P41
MIL-3661/33	LC 33 RN2	6P25
	LC 33 YN2	8P25
	LC 33 WT2	17P25
	LC 33 CN2	5P25
MIL-L-3661/34	LC 34 EN 2/DO2	80250-11
	LC 34 CN 2/DO2	80250-12
	LC 34 EN 2/EN2	80250-13
	LC 34 CN 2/EN2	80250-14
	LC 34 EN 2/SO2	80250-15
	LC 11 CN 2/SO2	80250-16
MIL-L-3661/35	LC 35 RN2	6P24
	LC 35 GN2	7P24
	LC 35 YN2	8P24
	LC 35 CN2	5P24
	LC 35 GT2	7P24TL
	LC 35 YT2	12P24TL
	LC 35 RT2	6P24TL
	LC 35 WT2	5P24TL
MIL-L-3661/40	LHC 82/1 WT2	99-36980-5TL
	LHC 82/1 RT2	99-36980-6TL
	LHC 82/1 GT2	99-36980-7TL
	LHC 82/1 YT2	99-36980-12TL
	LHC 82/2 YT2	99-36980-12TL
	LHC 82/2 WT2	99-36980-5TL
	LHC 82/2 RT2	99-36980-6TL
	LHC 82/2 GT2	99-36980-7TL
MIL-L-3661/46	LH 88/1	31-36680
	LH 88/2	31-36681
MIL-L-3661/47	LH 89/1	11-35182
MIL-L-3661/51	LH 92/1	91-80280

Cross Reference "MS" Numbers	
Military Standard	Electroswitch Part Number
MS 25041-1	01-91180-1
MS 25041-2	01-91180-2
MS 25041-3	01-91180-3
MS 25041-4	01-91180-4
MS 25041-5	01-91180-5
MS 25041-6	01-91180-6
MS 25041-7	01-91180-7
MS 25041-8	01-91180-8
MS 25041-10	01-91180-10
MS 25041-11	01-91180-11
MS 25256-2	11-33480-8P12
MS 25256-4	11-33480-7P12
MS 25256-6	11-33480-6P12
MS 25256-8	11-33480-5P12
MS 25256-10	11-33480-5P12TL
MS 25256-12	11-33480-11P12
MS 25331-1	02-91180-1
MS 25331-2	02-91180-2
MS 25331-3	02-91180-3
MS 25331-4	02-91180-4
MS 25331-5	02-91180-5
MS 25331-6	02-91180-6
MS 25331-7	02-91180-7
MS 25331-8	02-91180-8
MS 25331-9	02-91180-9

Lamp Selection Guide

INDICATOR LIGHTS



INCANDESCENT TYPE						
Size T-1 Sub-midget Flange Base 	LAMP NO.	RATED VOLTAGE	AMPERAGE	APPROX. CANDLEPOWER	AVERAGE LIFE (Hrs.)	NOTES
	682	5.0	.060	.03	100,000	MS24515-682
	685	5.0	.060	.05	100,000	MS24515-685
	718	5.0	.115	.15	40,000	MS24515-718
	6839	28.0	.024	.13	16,000	MS3338-6839
Group M						
Size T-1 3/4 Midget Flange Base 	331	1.35	.06	.01	500	
	268	2.5	.35	.21	10,000	
	338	2.7	.06	.04	6,000	MS25237-338
	345	6.0	.04	.03	10,000	
	328	6.0	.20	.34 @ 5 V	1,000	MS25237-328
	380	6.3	.04	.02	50,000	
	350	6.3	.15	.45	3,000	
	349	6.3	.20	.55	3,000	
	381	6.3	.20	.40	50,000	
	344	10.0	.014	.004	10,000	
	367X	10.0	.04	.08	5,000	
	330	14.0	.08	.50	750	MS25237-330
	370	18.0	.04	.15	1,000	
	327	28.0	.04	.34	1,000	MS25237-327
	387	28.0	.04	.30	25,000	MS25237-387
Size T-3 1/4 Miniature Bayonet Base Single Contact 	316	6.0	.70	3.4	500	MS25231-316
	44	6.3	.25	.9	3,000	
	47	6.3	.15	.52	3,000	
	1816	13.0	.33	3.0	1,000	
	1815	14.0	.20	1.4	3,000	
	313	28.0	.17	3.0	500	MS25231-313
	1819	28.0	.04	.34	1,000	MS25231-1819
	1829	28.0	.075	1.0	1,000	MS25231-1829
	1835	55.0	.05	1.1	10,000	
Group A						
Group B						
NEON GLOW TYPE						
Size T-2 	LAMP NO.	RATED VOLTAGE	STARTING VOLTAGE	RECOMMENDED SERIES RESISTOR	NOTES	
	AIG	105-125 AC OR DC	65 VAC 95 VDC	68K Ω		
Group C Size T-2 	AIH (High Brightness)	105-120 VAC 150 VDC	95 VAC	27K Ω		
	C7A	105-125 AC OR DC	65 VAC 90 VDC	68K Ω	MS25252-C7A	
Group D	C9A (High Brightness)	105-125 AC OR DC	105 VAC	27K Ω	MS25252-C9A	
LAMPS WITH BUILT-IN RESISTOR						
Size T-2 	LAMP NO.	RATED VOLTAGE	STARTING VOLTAGE	NOTES		
	A1HR1	105-125 VAC	65 VAC 95 VDC			
	A1GR1	105-125 VAC	95 VAC			
	A1GR2	105-125 VAC	130 VAC			

Notes:

1. Candlepower values indicated are approximate initial mean spherical candlepower at rated voltage.
2. Service conditions such as voltage surges, temperature, shock, and vibration may contribute to a shorter average life.