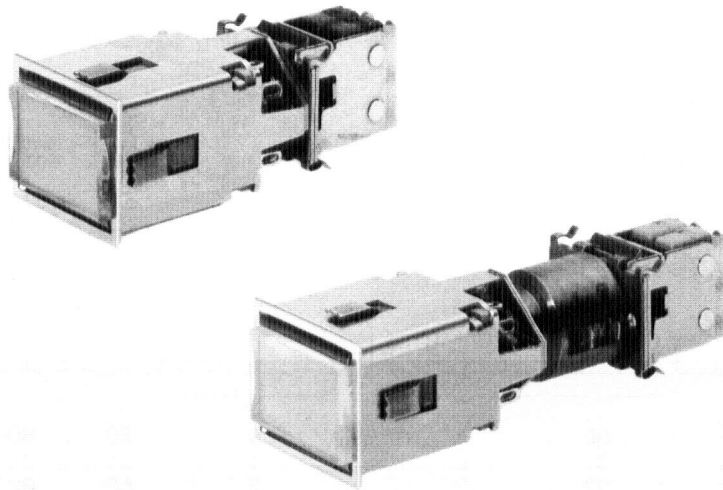
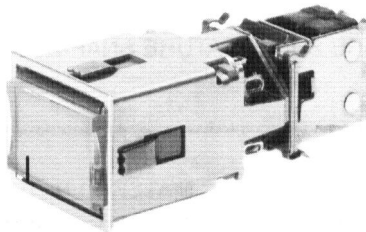


9/9M/9H SERIES **LIGHTED PUSHBUTTON
CONTROLS & INDICATORS**



9/9M/9H SERIES



Part No. Shown: 9H - 1121304000050684726

Introduction

The 9/9M/9H SERIES ILLUMINATED PUSHBUTTON CONTROLS & INDICATORS are designed for panel mount applications. The 9 Series is the commercial version. The 9M Series is a military version designed to conform to MIL-PRF-22885/9 thru /13 & /85. The 9H Series is a military version designed for high shock applications and conforms to MIL-PRF-22885. A lens locking tab and high shock clip are employed to secure the assembly. All of these switches and indicators are available with multi-colored illumination and many types of lens engraving formats. They feature four-bulb illumination and nine different circuit configurations allowing display customization. The pushbutton control units are also available with two or four pole switch modules with either momentary or alternate action function. All parts are easily replaced or interchanged.

Easy Build-A-Switch

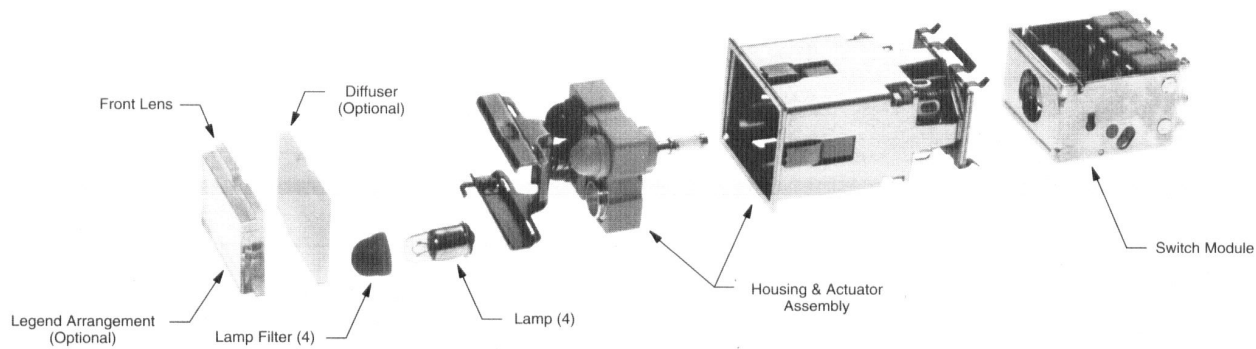
Build-A-Switch allows you to mix and match options to create the switch you need, simply select the desired option from each category. Most available options are shown and described on the following pages. Complete HOW TO ORDER information is at the end of the section. Hardware and accessories are available separately or with completed units.

SERIES	HOUSING & ACTUATOR ASSEMBLY	LAMP CIRCUIT	DIFFUSER	LAMP FILTER	LAMP	SWITCH MODULE	FRONT LENS	ENGRAVING
Illuminated Pushbutton Military Controls & Indicators	Switch Actuator Assembly	5 Terminal Common Ground	White	Without Colored Filter	Without Lamp	Indicator	No Lens	12 Letters or Spaces
9	11	21	30	4	50	60	70	(NONE)
9M	13	22	31	0	51	61	71	8 1
9H	14	24	32	2	51	63	73	2
	15	25	33	3	52	64	726	3
	16	26	35	4	53	66		4
		27	36	5	54	684		5
		28	37	6	55	686		6
		29	38	7	56	688		7
		201	39		57	690		8
			311					
			312					
			313					
			315					
			316					
			317					
			318					
			319					

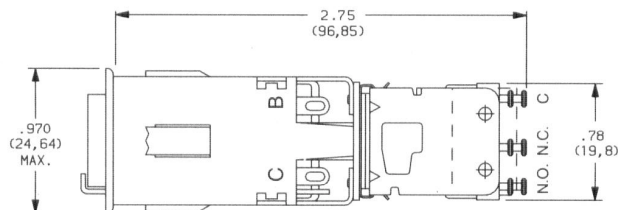
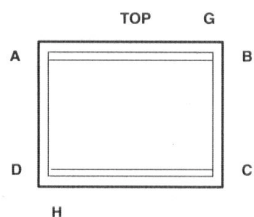
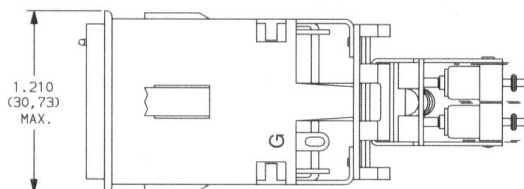
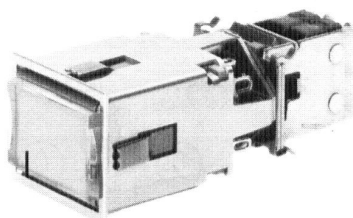
9/9M/9H SERIES

LIGHTED PUSHBUTTON CONTROLS & INDICATORS

ORIENTATION OF COMPONENTS



BASIC SWITCH MODEL



LAMP TERMINAL LOCATIONS
FRONT VIEW

Part No. Shown: 9H-1121304000050684726

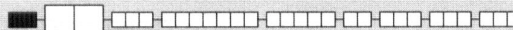
SERIES

- 9** STANDARD 4-LAMP, COMMERCIAL LIGHTED PUSHBUTTON SWITCHES
- 9H** MILITARY HIGH SHOCK ILLUMINATED PUSHBUTTON SWITCHES (CONFORMS TO MIL-PRF-22885)
- 9M** MILITARY ILLUMINATED PUSHBUTTON SWITCHES (CONFORMS TO MIL-PRF-22885/9 THRU /13, /85)

9/9M/9H SERIES

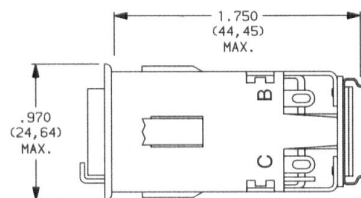
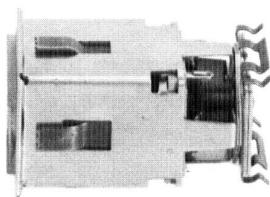
LIGHTED PUSHBUTTON CONTROLS & INDICATORS

HOUSING & ACTUATOR ASSEMBLY



11 SWITCH ACTUATOR

16 INDICATOR LIGHT

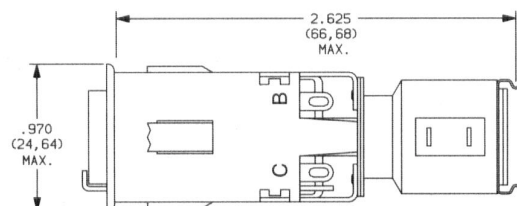
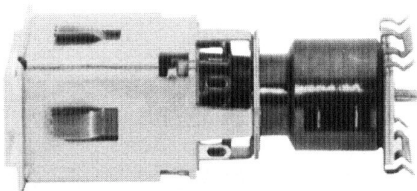


WITHOUT HOLDING COIL

13 SWITCH ACTUATOR WITH
28 V DC HOLDING COIL

14 SWITCH ACTUATOR WITH
12 V DC HOLDING COIL

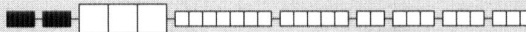
15 SWITCH ACTUATOR WITH
6 V DC HOLDING COIL



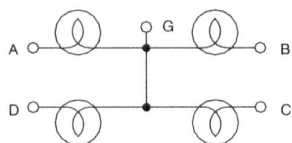
WITH HOLDING COIL

NOTE: Available with 9H Series only.

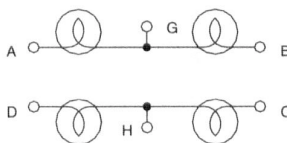
LAMP CIRCUIT



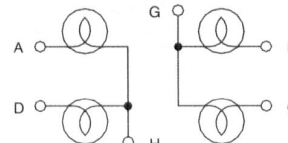
21 5 TERMINAL, COMMON GROUND



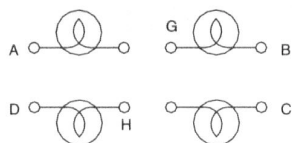
22 6 TERMINAL, DUAL GROUND
(Two color full or horizontal display.)



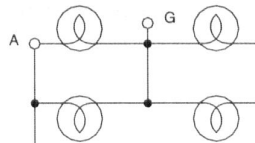
24 6 TERMINAL, DUAL GROUND
(Vertical display.)



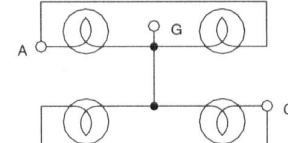
25 8 TERMINAL, SEPARATE GROUNDS



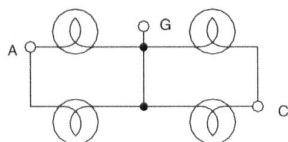
26 2 TERMINAL, COMMON GROUND,
COMMON INPUT
(Single color.)



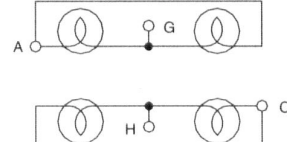
27 3 TERMINAL, COMMON GROUND,
HORIZONTAL SPLIT INPUTS
(2 color full or horizontal display.)



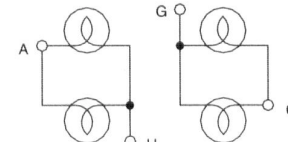
28 3 TERMINAL, COMMON GROUND,
VERTICAL SPLIT INPUTS
(Vertical display.)



29 4 TERMINAL, DUAL GROUND,
HORIZONTAL SPLIT INPUTS
(2 color full or horizontal display.)



201 4 TERMINAL, DUAL GROUND,
VERTICAL SPLIT INPUTS
(Vertical display.)

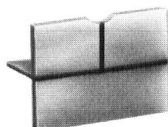


9/9M/9H SERIES

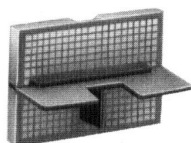
LIGHTED PUSHBUTTON CONTROLS & INDICATORS

DIFFUSER

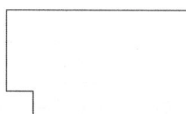
The diffuser determines the display style of the switch (full, horizontal, vertical, etc., as shown). The optional RFI shield is a fine wire screen that provides protection against undesirable RFI energy passing through the LPB.



TYPICAL DIFFUSER
WITHOUT RFI SHIELD



TYPICAL DIFFUSER
WITH RFI SHIELD



Diffusers for 9H Series (High shock)
are notched as shown to provide
clearance for shock protection lock tab.

30 NO DIFFUSER SUPPLIED

31 9M - WITHOUT RFI SHIELD

32 9M - WITHOUT RFI SHIELD

311 9M - WITH RFI SHIELD

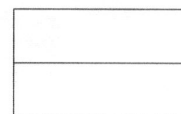
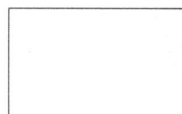
312 9M - WITH RFI SHIELD

357 9H - WITHOUT RFI SHIELD

358 9H - WITHOUT RFI SHIELD

368 9H - WITH RFI SHIELD

372 9H - WITH RFI SHIELD



33 9M - WITHOUT RFI SHIELD

35 9M - WITHOUT RFI SHIELD

36 9M - WITHOUT RFI SHIELD

313 9M - WITH RFI SHIELD

315 9M - WITH RFI SHIELD

316 9M - WITH RFI SHIELD

362 9H - WITHOUT RFI SHIELD

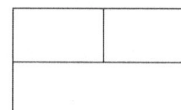
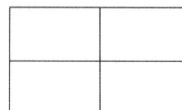
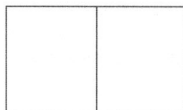
360 9H - WITHOUT RFI SHIELD

359 9H - WITHOUT RFI SHIELD

376 9H - WITH RFI SHIELD

373 9H - WITH RFI SHIELD

395 9H - WITH RFI SHIELD



37 9M - WITHOUT RFI SHIELD

38 9M - WITHOUT RFI SHIELD

39 9M - WITHOUT RFI SHIELD

317 9M - WITH RFI SHIELD

318 9M - WITH RFI SHIELD

319 9M - WITH RFI SHIELD

363 9H - WITHOUT RFI SHIELD

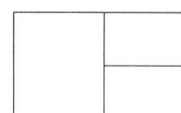
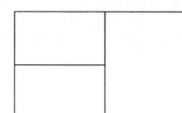
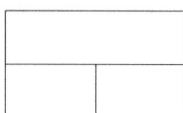
365 9H - WITHOUT RFI SHIELD

366 9H - WITHOUT RFI SHIELD

379 9H - WITH RFI SHIELD

396 9H - WITH RFI SHIELD

397 9H - WITH RFI SHIELD

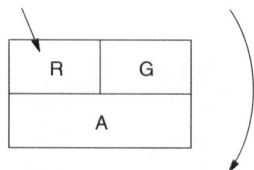


DIFFUSER COLORS

Diffuser colors are specified in a clockwise direction, starting from the upper left diffuser position when viewed from the front of the panel.

1. Start selection in upper left diffuser position.

2. Continue selection in a clockwise direction.



TYPICAL DIFFUSER
EXAMPLE: 36RGA*

OPTION CODE	DIFFUSER COLOR
A	AMBER
B	BLUE
G	GREEN
R	RED
W	WHITE (STD.)
Y	YELLOW

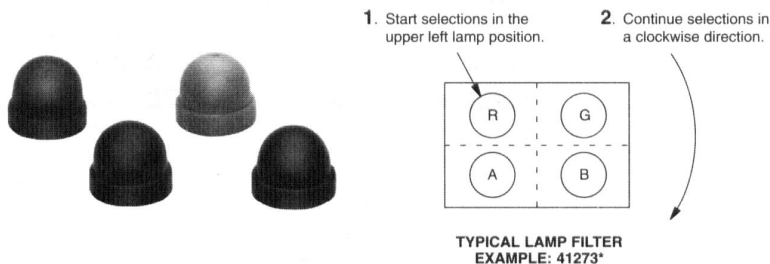
*Example: 36RGA, specifies a 3 way split diffuser, without RFI shield and red, green and amber colors.

9/9M/9H SERIES

LIGHTED PUSHBUTTON CONTROLS & INDICATORS

LAMP FILTER

Lamp filter colors are specified in a clockwise direction, starting from the upper left lamp filter position, when viewed from the front of the panel. The option code should always begin with a '4' followed by four color codes.



*EXAMPLE: 41273, specifies a 4 way split lamp filter, with red, green blue and amber colors.

LAMP FILTER COLORS

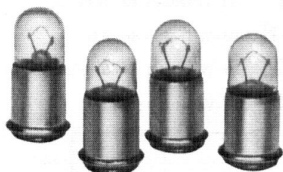
OPTION CODE	FILTER COLOR
0	WITHOUT FILTER
1	RED
2	GREEN
3**	AMBER
4	YELLOW
6	WHITE
7	BLUE

NOTE: White filters appear pale blue when not illuminated.

** '3' Amber lamp filter not available with 9M Series models.

LAMPS

Each 9H/9M Series Lighted Pushbutton holds four, T-1 3/4, midjet flange base lamps.

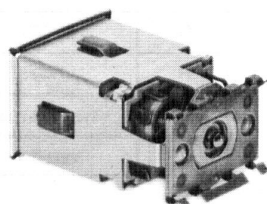


OPTION CODE	VOLTAGE	MILITARY APPROVALS
50	Units Without Lamps	N / A
51	6 V	MS-25237/328
52	6 V (Long Life)	MS-25237/381
53	14 V	MS-25237/330
54	14 V (Long Life)	MS-25237/382
55	28 V	MS-25237/327
57	28 V (Long Life)	MS-25237/387

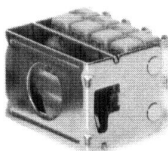
NOTE: Military approvals are as shown.

SWITCH MODULE

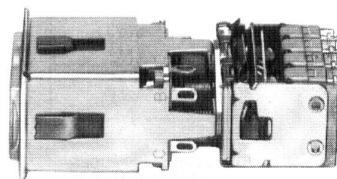
Switch modules are available in 2 or 4 pole, momentary or alternate action. Modules snap onto the rear of the front housing by means of a spring clip. An additional high shock clip ensures switch module retention (see hardware, section L). Switch terminations are double turret style 'D', which accepts two #20 AWG wire leads. They are available with silver (standard) or gold contacts. Other terminal styles and switch modules are available, consult factory. 9M Series is MIL-S-22885/9 thru /13 and /85 approved.



ACTUATOR ASSEMBLY



SWITCH MODULE



COMPLETE SWITCH ASSEMBLY

9/9M/9H SERIES LIGHTED PUSHBUTTON CONTROLS & INDICATORS

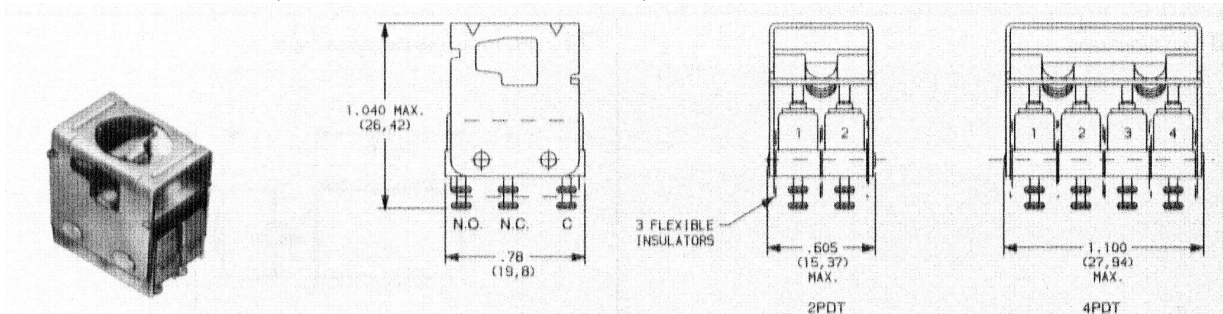
SWITCH MODULE



60 NO SWITCH MODULE (INDICATOR)

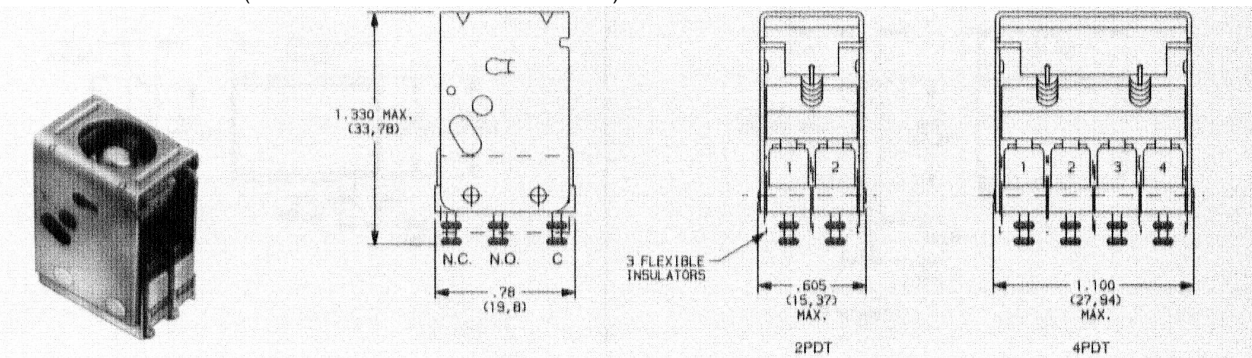
- 61** 2 POLE MOMMENTARY (COMMERICAL RATED SNAP SWITCHES)
- 63** 4 POLE MOMMENTARY (COMMERICAL RATED SNAP SWITCHES)
- 684** 2 POLE MOMMENTARY (MILITARY RATED SNAP SWITCHES)
- 686** 4 POLE MOMMENTARY (MILITARY RATED SNAP SWITCHES)

MOMMENTARY SWITCHES

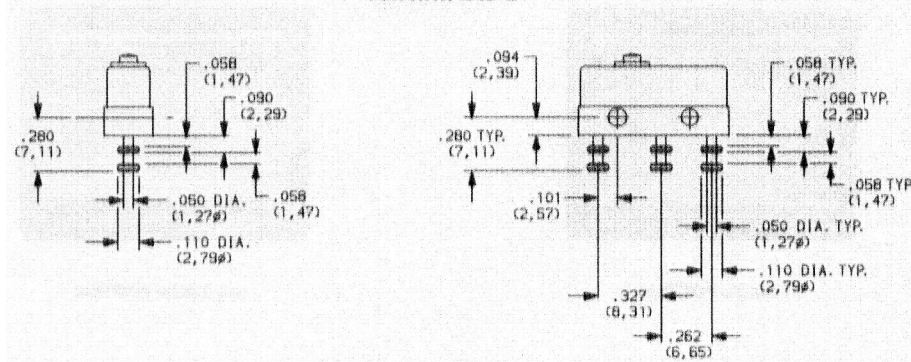


- 64** 2 POLE ALTERNATE (COMMERICAL RATED SNAP SWITCHES)
- 66** 4 POLE ALTERNATE (COMMERICAL RATED SNAP SWITCHES)
- 688** 2 POLE ALTERNATE (MILITARY RATED SNAP SWITCHES)
- 690** 4 POLE ALTERNATE (MILITARY RATED SNAP SWITCHES)

ALTERNATE ACTION SWITCHES



TERMINALS



9/9M/9H SERIES

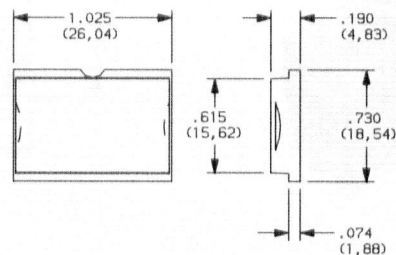
LIGHTED PUSHBUTTON CONTROLS & INDICATORS

FRONT LENS

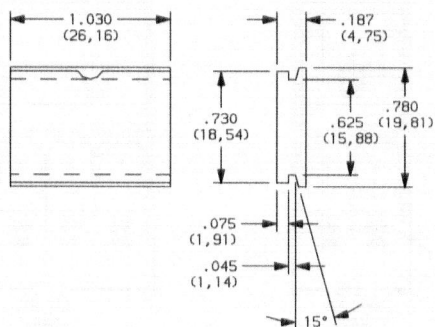
To safe guard against accidental actuation, 9/9M/9H Series Illuminated Pushbutton Controls & Indicators are designed to effect switch transfer only after the lens has been depressed below the housing unit. The unit, plus the actual separation of lenses, prevents an operator from actuating more than one switch at a time. 9H Series are equipped with a locking tab that is secured to the lens retainer to prevent lens removal under shock conditions. 9M Series lens options 71 & 73 conform to MIL-PRF-22885/85.

70 NO FRONT LENS

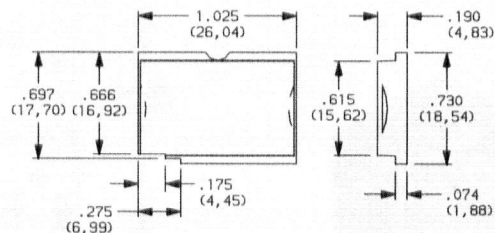
71 STANDARD LENS (9M SERIES ONLY)



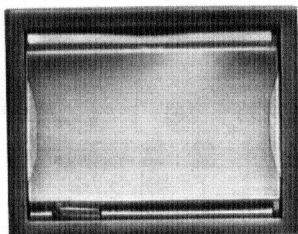
73 EXTENDED FRONT LENS (9M SERIES ONLY)



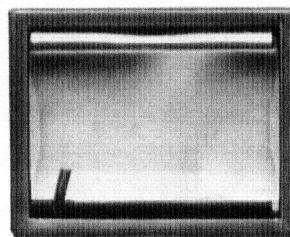
726 HIGH SHOCK LENS (9H SERIES ONLY)



9H Series are equipped with a locking tab that is secured to the lens retainer to prevent lens removal under shock conditions.



LOCKED POSITION



UNLOCKED POSITION

9/9M/9H SERIES

LIGHTED PUSHBUTTON CONTROLS & INDICATORS

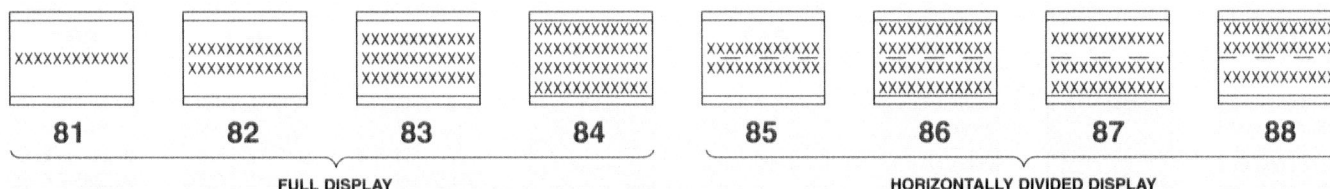
ENGRAVING



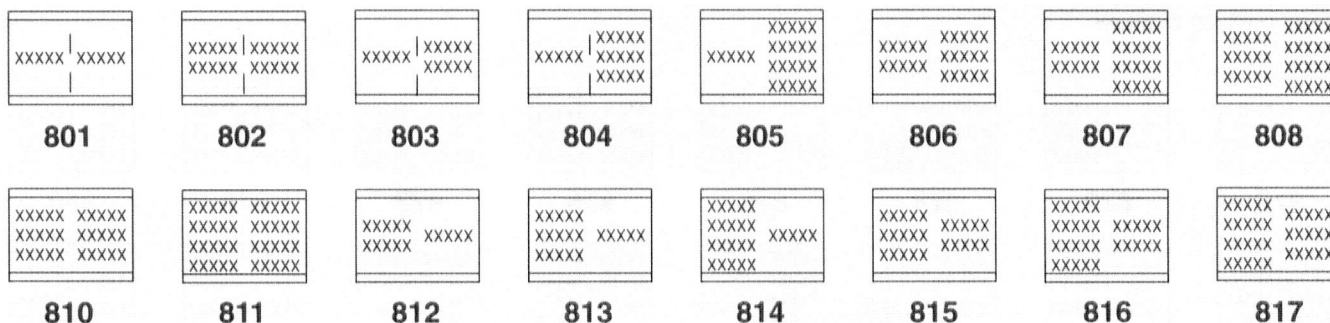
Select the appropriate code number for the desired legend arrangement. Write the legend after the code number, inserting a comma (,) to denote a new line and a slash (/) to denote a new lens division. As with the colored filters, start at the upper left corner and work clockwise. Legends are engraved on the backside of the lens and filled with black ink. Standard engraving is .125" high, with a .020" stroke. Vertically mounted engraving also available, consult factory. If switch is to be furnished without engraving on the front lens, ENGRAVING option need not be completed.

(NONE) NO ENGRAVING

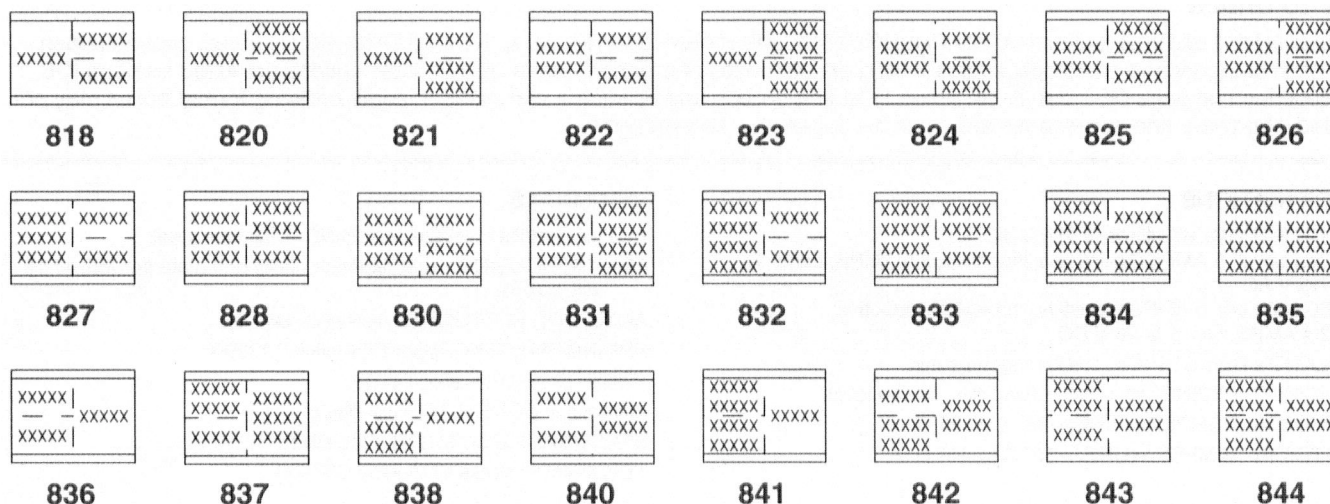
12 LETTERS OR SPACES PER ROW FULL AND HORIZONTALLY DIVIDED DISPLAYS



5 LETTERS OR SPACES PER ROW VERTICALLY DIVIDED DISPLAY



5 AND 12 LETTERS OR SPACES PER ROW 3-WAY DIVIDED DISPLAY

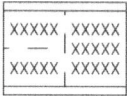
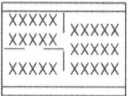
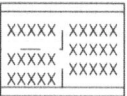
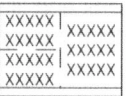
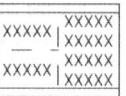
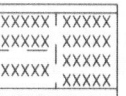
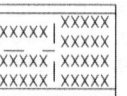
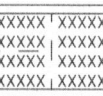
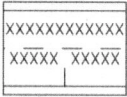
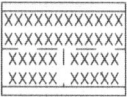
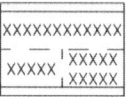
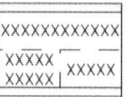
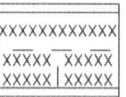
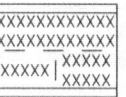
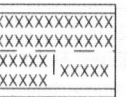
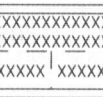
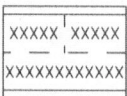
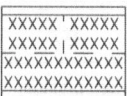
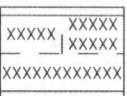
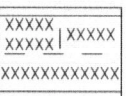
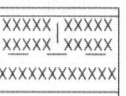
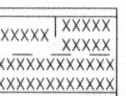
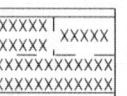
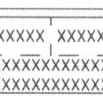


9/9M/9H SERIES

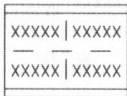
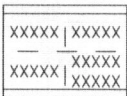
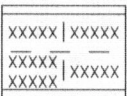
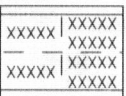
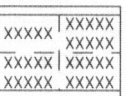
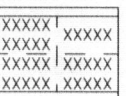
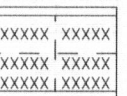
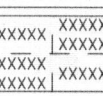
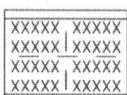
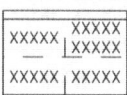
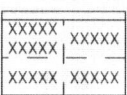
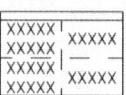
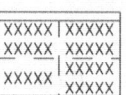
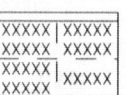
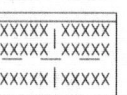
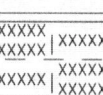
LIGHTED PUSHBUTTON CONTROLS & INDICATORS

ENGRAVING 

5 AND 12 LETTERS OR SPACES PER ROW 3-WAY DIVIDED DISPLAY

							
845	846	847	848	850	851	852	853
							
854	855	856	857	858	860	861	862
							
863	864	865	866	867	868	870	871

5 LETTERS OR SPACES PER ROW 4-WAY DIVIDED DISPLAY

							
872	873	874	875	876	877	878	880
							
881	882	883	884	885	886	887	888

HOW TO ORDER

To order 9/9M/9H SERIES ILLUMINATED PUSHBUTTON CONROLS & INDICATORS, simply select desired option from each category and place option code in appropriate boxes of ordering format. Consult factory for options not listed. When selecting options and building a part number, some ordering format boxes may not be filled. Hardware and accessories are available separately or maybe added to the end of the part number.

SPECIFICATIONS

SWITCH RATING 9 SERIES: 11A, ¼ HP 125 OR 250 VAC
SWITCH RATING 9M/9H SERIES:
Sea Level: 5 A, Resistive & Inductive, 1.5 A @ 115 VAC
5 A, Resistive, 3 A, Inductive, 2.4 A, Lamp @ 28 VDC
50,000 Feet: 5 A, Resistive, 2.5 A, Inductive, 2.4 A, Lamp @ 28 VDC

INSULATION RESISTANCE: 1,000 megaohms min.
DIELECTRIC STRENGTH: 1,000 V RMS min. @ sea level
MECHANICAL TEMPERATURE: -55° C to 85° C
ELECTRICAL TEMPERATURE: : -55° C to 71° C

MATERIALS

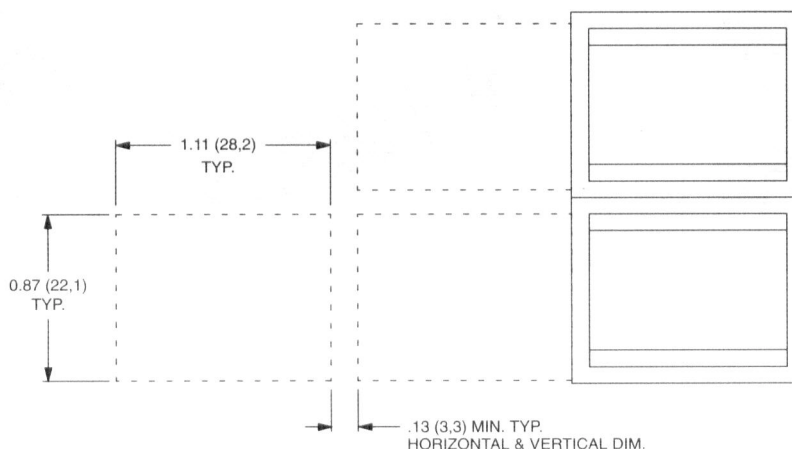
ACTUATOR/INDICATOR HOUSING: Stainless Steel
SWITCH HOUSING 9 SERIES: Heat resistant phenolic (UL 94 V-0)
SWITCH HOUSING 9M/9H SERIES: Heat resistant diallyl phthalate
Per MIL-M-14 (UL94 V-0)
ACTUATOR BUTTON: Polyester (UL V-0)
SPRING: Beryllium copper CDSA alloy C17200
PIVOT: Brass CDA alloy 26000
MOVABLE CONTACTS: Fine silver
STATIONARY CONTACTS: Fine silver
TERMINALS: Brass CDA alloy C36000

9/9M/9H SERIES

LIGHTED PUSHBUTTON CONTROLS & INDICATORS

PANEL MOUNTING

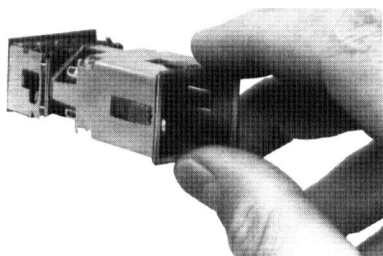
Unit can be mounted singly, in vertical or horizontal rows, and/or space saving panel matrices. In all cases, the devices are individually mounted to panel and are not dependant upon other units for support. This feature permits individual units to be replaced without disturbing adjacent controls.



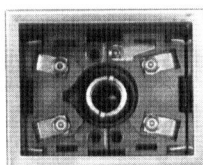
PANEL THICKNESS: .050" to .250"
PANEL CUTOUT TOLERANCES: $\pm .010$

MOUNTING INSTRUCTIONS

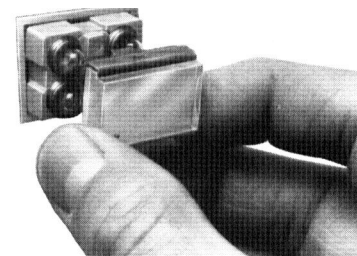
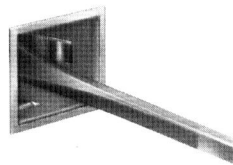
Mounting or removal of the 9/9M/9H Series is accomplished from the front of the panel by tightening or loosening a single captive screw. This single screw controls four clamps that securely lock the unit to any panel between .050" & .250" thickness. No mounting sleeve loose hardware is required.



1. Place unit in panel.



2. Tighten single leadscrew.



3. Insert front assembly.

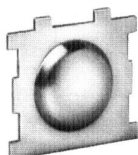
RELAMPING INSTRUCTIONS

A simple pull/push action frees the lamp holder assembly when lamps or filters require changing. Filters and lamps are independently mounted and either can be easily replaced without disturbing the other.

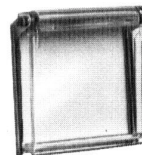
9/9M/9H SERIES **LIGHTED PUSHBUTTON**
CONTROLS & INDICATORS

9, 9H & 9M SERIES OPTIONAL ACCESSORIES

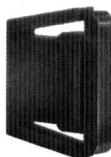
- 90** **PLUNGER STOP PLATE**
Plunger stop plate converts an actuator to an indicator.



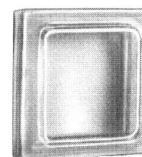
- 901** **SWITCH GUARD**
A hinged, clear plastic cover which must be manually raised in order to actuate the LPB, preventing accidental switch operation.



- 9010** **SPACE BARRIER**
Space barriers provide additional separation between adjacent units. Available in black, white or gray. For either short or long sides. Other models available, consult factory.



- 9012** **DRIP-PROOF SEAL**
A clear seal prevents the entrance of liquids and foreign matter through the LPB. Easily removable for relamping. MIL-S-22885/13 approved.



- 9031** **HIGH SHOCK CLIP**
The high shock clip provides positive attachment of switch modules, standard with all 9H Series, except indicators.

