

Lighted Pushbutton Switches

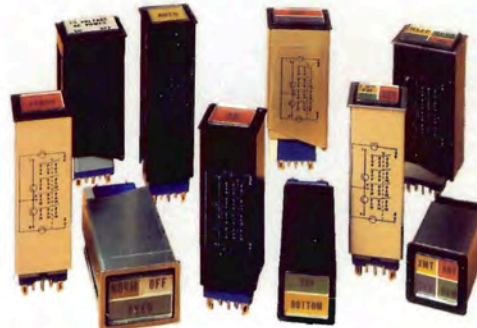
Series 40 QPL and Industrial Display

stacosystems

One Step Ahead

A Components Corporation of America Company

models 1M, 1MR, 101M, 101MR,
40, 40R, 49, 491,
2S and 2R



SERIES 40

LIGHTED DISPLAY PUSHBUTTON SWITCHES AND INDICATORS

- **INDIVIDUAL OR MATRIX MOUNT**
- **STANDARD LIGHTED DISPLAYS**
- **NUMEROUS SWITCHING OPTIONS**
- **SQUARE OR RECTANGULAR**
- **ALL THE POPULAR TERMINATION STYLES**
- **MEETS OR EXCEEDS ALL APPLICABLE MIL-SPEC REQUIREMENTS**

PRODUCT DESIGN & ENGINEERING DATA	1
QUICK REFERENCE CHART	2
MILITARY SPECIFICATIONS	3
MILITARY CROSS REFERENCE	4
MATRIX PRODUCTS, MODELS 1M/1MR/101M/101MR	5
MATRIX HOUSING TERMINATION RECEPTACLES	6-7
DIMENSIONS, REAR MOUNT FLANGE AND DRESS BEZEL	8-9
ORDERING SYSTEMS	10
SWITCH INDICATOR MODULES, MODEL 40	11-12
INDIVIDUAL MOUNT PRODUCTS, MODELS 49/491	13
ORDERING INFORMATION	14
INDIVIDUAL MOUNT SWITCH/INDICATORS, MODELS 40/40R	15-17
ORDERING INFORMATION	17
PUSHBUTTON OVERVIEW	18
PUSHBUTTON, MODEL 40	19-22
ORDERING INFORMATION	22
PUSHBUTTON, MODEL 40R	23-25
ORDERING INFORMATION	25
COMMERCIAL/INDUSTRIAL PRODUCTS, MODEL 2	26-28
ORDERING INFORMATION	29
ACCESSORIES	30-32
OTHER STACO PRODUCTS	INSIDE BACK COVER
LIGHTING AND SWITCHING CONTROLLERS	BACK COVER

All information published in this catalog is effective as of the date of publication and is subject to change without notice. All printing and clerical errors are subject to correction.

GENERAL INFORMATION

StacoSwitch products are designed and manufactured to meet exacting specifications of Original Equipment Manufacturers who demand dependability, attractive appearance, and maximum value from their products. Combining imaginative engineering with manufacturing know-how, StacoSwitch offers the most versatile and reliable circuit control components available.

StacoSwitch's full line of Lighted Pushbutton Switches and Indicators provide a wide selection of circuitry control capabilities and display screen combinations. Design and performance features, durability, cost savings and dependable delivery schedules combine to make StacoSwitch your best buy. When you compare total cost...purchase, installation, and maintenance... you can't beat StacoSwitch.

QUALITY CONTROL

StacoSwitch maintains a Quality Control Department to attain the company's high quality objectives in every level of production. The inspection system and documentation used to control the quality of products manufactured conforms to all requirements of MIL-I-45208A. As an approved manufacturer of Qualified Products List (QPL) parts StacoSwitch's program is regularly monitored by Defense Department Agencies.

NUCLEAR QUALIFIED

StacoSwitch Lighted Display Pushbutton Switches and Indicators are qualified to IEEE Standards 323-1974, 344-1975, and 381-1977 and TVA 2200 appendix "C". The nuclear environmental test program, includes thermal aging, cyclic, seismic (fragility and generic), endurance tests. Series 40 switches and matrices and Series 60 Switch/Indicators are qualified for use in Nuclear Fueled Power Generating Stations. By eliminating the need to retest and requalify specific switch/indicators for specific installations, our customers save significant time and money. StacoSwitch's broad line of qualified switch/indicators provides control systems designers with the right choice to meet the demanding requirements of today's power and process plants.

MATERIALS

The basic switch/indicator module body is made of a premium grade glass filled thermoplastic polyester. This material offers high impact strength, dielectric strength, and insulation resistance. UL recognized, the plastic is fire resistant and flame retardant. Though resistant to many common solvents and cleaning solutions it is recommended that isopropyl alcohol is used for cleaning.

Matrix housing assemblies and switch housings are made of aluminum for high structural strength combined with light weight. Black anodized finish on all non-shielded units provides a corrosion resistant surface. RFI/EMI shielded units have a conductive chem-film irridite finish that is equally corrosion resistant. Contact materials are high conductivity precious metal alloys, gold plated. Switch moving contacts are not based on over-center springs. No springs are used in the switch circuits as conductors, eliminating all problems of annealing and loss of spring pressure. Pushbutton plastic color chips provide controlled color diffusion and excellent resistance to high temperature. Face plate has high structural strength and hardness to resist surface scratches. Stainless steel pushbutton housing provides structural strength and heat sinking capability.

HEAT

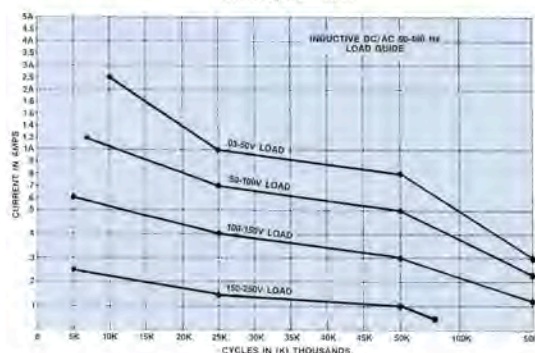
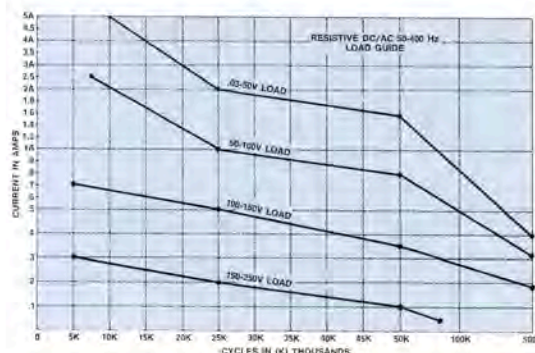
Materials used in StacoSwitch units provide excellent resistance to high temperatures. Switches can be operated in most conditions with up to two lamps continuous duty for touch comfort. In matrix assemblies where significant temperature potential exists external cooling or heat sinking may be required to maintain comfortable pushbutton surface temperature. Reduced heat build-up where continuous lamp duty is required can be achieved by dispersing these switch or indicator stations throughout the matrix rather than grouping them in one area of the assembly. Specific units can be designed with heat rise as a specific consideration. Contact factory for design assistance.

LIGHTING

StacoSwitch maintains a fully equipped and certified light laboratory to perform military specification tests, including MIL-S-22885, MIL-C-25050, MIL-P-7788D, and Fed STD No. 3. Light laboratory capabilities include brightness, color, contrast, reflectance, angle of observation, sunlight readability and night vision measurements. Pushbuttons accept T-1-3/4 midget flange base incandescent lamps or LEDs, M25237 or equivalent, with design voltage ranging from 1.35 to 28 VDC, and neon lamps for operation on 115 VAC. Pushbutton temperature is directly related to incandescent lamp brightness and power consumption. A lower temperature can be achieved by reducing the power consumed by the lamp, if lower brightness is acceptable. Within the parameters of the selected lamp, display colors, and legend style, color and brightness within a customer specified range can be furnished.

LOADS

Switch load ratings are a function of life, temperature, duty cycle, and type of load, whether resistive or inductive. Catalog ratings are optimum and include a safety margin of 150% of rated loads under prescribed conditions. Switches are capable of switching an open circuit load of 10 times the rated resistive. The basic switch module used in all StacoSwitch 4-lamp switches is a UL recognized component listed under File No. E50237. The following chart shows life/load switching capacities:



QUICK REFERENCE GUIDE

Matrix Mount Products

MODEL	SHAPE	TERMINATION	PUSHBUTTON	SWITCH MODULE
1M	SQ	SOLDER WIREWRAP PC	40	40M
1MR	RECT		40R	40MR
101M	SQ	CRIMP	40	401M
101MR	RECT	CRIMP	40R	401MR

Individual Mount Products

MODEL	SWITCH /INDICATOR	SHAPE	MOUNT	GROUND	PUSHBUTTON REGULAR LATCHDOWN
2S	S, I	SQ	FLUSH	CLG, SLG	2S, 40T, 40J
2R	S, I	RECT	FLUSH	CLG, SLG	2R, 40RNT, 40RNJ
40R	S, I	RECT	FLUSH	CLG SLG	40RCT, RNT 40RNJ
41, 43	I	SQ	FLUSH	CLG SLG	40T 40W 40J 40N
42, 44	I	SQ	EXTENDED	CLG SLG	40T 40W 40J 40N
45, 46	S	SQ	FLUSH	CLG SLG	40T 40W 40J 40N
47, 48	S	SQ	EXTENDED	CLG SLG	40T 40W 40J 40N
49, 491	S, I	SQ	CLAMP SLEVE	CLG SLG	40T 40J
R40R	S, I	RECT	FLUSH	CLG SLG	40RCU, RNV 40RNL
R41, R43	I	SQ	FLUSH	CLG SLG	40U 40Y 40L 40P
R42, R44	I	SQ	EXTENDED	CLG SLG	40U 40Y 40L 40P
R45, R46	S	SQ	FLUSH	CLG SLG	40U 40Y 40L 40P
R47, R48	S	SQ	EXTENDED	CLG SLG	40U 40Y 40L 40P
R49, R491	S, I	SQ	CLAMP SLEVE	CLG SLG	40U 40L

Various StacoSwitch switches and accessories have been granted Qualified Product Listings under MIL-S-22885, and MIL-S-8805. Complete cross reference lists of all MIL Spec Parts numbers and corresponding StacoSwitch parts numbers are available on request. Items not included in the MIL Spec listing are manufactured to the same exacting specifications and meet or exceed all requirements for MIL-S-24317 and MIL-S-22885.

In addition these products are designed and manufactured to conform to the following specifications where applicable.

FED-STD-3	Colors : Aeronautical Lighting
MIL-STD-130	Identification and Marking of US Military Property
MIL-STD-202	Test Methods for Electronic and Electrical Component Parts
MIL-STD-411	Air Crew Station visual Signals
MIL-E-5272	Environmental Testing, Aeronautical
MIL-E-5400	Electronic Equipment, Aircraft
MIL-T-5422	Testing, Environmental, Aircraft Electronic Equipment
MIL-S-8805	Switches, Sensitive and Push, Snap Action, Actuators and Enclosures
MIL-M-18012	Markings for Air Crew Station displays
MIL-C-25050	Design and Configuration of Colors, Aeronautical Lights and Lighting Equipment
MIL-S-22885	Switches, Pushbutton, Illuminated
MIL-S-24317	Switches, Multistation, Pushbutton



Listed below are the major requirements to which StacoSwitch products are tested and qualified.

Thermal Shock	-55°C to +85°C, per MIL-STD-202C, Method 107, Test Condition A
Shock	50 G's 11 ± 1 millisecond; per MIL-STD-202C, Method 213
Vibration	.06 D.A. or 15 G's, 10 to 2,000 Hz per MIL-STD-202C, Method 204, Test Condition B
High Impact Shock	3 hammer blows each axis per MIL-STD-901C. No deformation or damage
Sand and Dust	Per MIL-STD 202C, Method 110, Test Condition B
Humidity	10 Days, with 10 cycles at 90-98 percent relative humidity at 65° C per MIL-STD-202, Method 106
Salt Spray	48 hr., per MIL-STD-202C, Method 101, Test Condition B, with pushbutton installed in a mating switch/indicator
Explosion	Unit can be safely operated under load in an explosive atmosphere without danger of explosion, per MIL-STD-202C, Method 109
Temperature	Operating, -65°C to +55°C
Altitude	Sea level to 70,000 feet
Fungus	None of the materials or finishes used in construction of these units will support any fungus encountered in tropical climates

MILITARY CROSS REFERENCE

Military Part Numbers

Various Series 40 Matrix Housings, Switches, Indicators and Display Screen Pushbuttons have been granted Qualified Products Listing under MIL-S-22885 and MIL-S-24317. The following list is a random selection of MIL-SPEC part numbers and corresponding StacoSwitch part numbers. A complete cross reference list is available on request.

Matrix Housing

MIL-S-24317	Matrix Housing
/9-001	1M0101N22S-2
/9-003	1M0301N22S-2
/9-005	1M0501N22S-2
/9-007	1M0701N22S-1
/9-009	1M0901N22S-1
/9-042	1M0202N22S-2
/9-044	1M0402N22S-2
/9-046	1M0602N22S-2
/9-048	1M0802N22S-1
/9-050	1M1002N22S-1
/9-052	1M0202N22W-2
/9-054	1M0402N22W-2
/9-056	1M0602N22W-2
/9-058	1M0802N22W-1
/9-060	1M1002N22W-1
/9-062	1M0202R22S-3
/9-064	1M0402R22S-3
/9-066	1M0602R22S-3
/9-068	1M0802R22S-3
/9-070	1M1002R22S-3

Switch/Indicator Module

MIL-S-22885	Switch/Indicator
/86-191	40MS08A
/86-192	40MS08B
/86-193	40MS07A
/86-194	40MS07B
/86-195	40MS00I

Switch/Indicator With Pushbutton

MIL-S-22885	Switch	Pushbutton
/86-018(XXXX)	49S08AS	40T00819XXXX500
/86-019(XXX)	49S08AS	40T00817XXXX300
/86-020(XX)	49S08AS	40T00816XXXX200
/86-021(X)	49S08BS	40T00815XXXX100
/86-034(XXXX)	49S08BS	40T00819XXXX500
/86-035(XXX)	49S08BS	40T00817XXXX300
/86-036(XX)	49S08BS	40T00816XXXX200
/86-037(X)	49S08BS	40T00815XXXX100
/95-018(XXXX)	49I08A	40T00819XXXX500
/95-019(XXX)	49I08A	40T00817XXXX300
/95-020(XX)	49I08A	40T00816XXXX200
/95-021(X)	49I08A	40T00815XXXX100
/95-034(XXXX)	49I08B	40T00819XXXX500
/95-035(XXX)	49I08B	40T00817XXXX300
/95-036(XX)	49I08B	40T00816XXXX200
/95-037(X)	49I08B	40T00815XXXX100

Pushbutton Only

MIL-S-22885	Pushbutton
/52-01	40T00819XXXX500
/52-02	40T00817XXXX300
/52-03	40T00816XXXX200
/52-04	40T00815XXXX100

Switch Only

MIL-S-22885	Switch
/56-001	46S08A
/56-002	46S08B
/56-003	45S08A
/56-004	45S08B
/56-141	46S07A
/56-142	46S07B
/56-143	45S07A
/56-144	45S07B
/56-133	R46S08A
/56-134	R46S08B
/56-135	R45S08A
/56-136	R45S08B
/56-137	R46S07A
/56-138	R46S07B
/56-139	R45S07A
/56-140	R45S07B

Switch And Pushbutton Assembly

MIL-S-22885	Assembly 40A0104	Switch	Pushbutton 40T00X
/56-005(XXXX)	05	46S08A	19-XXXX
/56-006(XXX)	06	46S08A	17-XXX
/56-007(XX)	07	46S08A	16-XX
/56-008(X)	08	46S08A	15-X
/56-009(XXX)	09	46S08A	18-XXX
/56-010(XX)	10	46S08A	20-XX
/56-012(XXX)	12	46S08A	22-XXX
/56-014(XXX)	14	46S08B	17-XXX
/56-016(X)	16	46S08B	15-X
/56-018(XX)	18	46S08B	20-XX
/56-020(XXX)	20	46S08B	22-XXX
/56-022(XXX)	22	46S07A	17-XXX
/56-024(X)	24	46S07A	15-X
/56-030(XXX)	30	46S07B	20-XX
/56-032(X)	32	46S07B	22-XXX
/56-038(XXX)	38	45S08A	17-XXX
/56-039(XX)	39	45S08A	16-XX
/56-040(X)	40	45S08A	15-X
/56-045(XXXX)	45	45S08B	19-XXXX
/56-046(XXX)	46	45S08B	17-XXX
/56-047(XX)	47	45S08B	16-XX
/56-048(X)	48	45S08B	15-X
/56-053(XXXX)	53	45S07A	19-XXXX
/56-054(XXX)	54	45S07A	17-XXX
/56-055(XX)	55	45S07A	16-XX
/56-056(X)	56	45S07A	15-X
/56-061(XXXX)	61	45S07B	19-XXXX
/56-062(XXX)	62	45S07B	17-XXX
/56-063(XX)	63	45S07B	16-XX
/56-064(X)	64	45S07B	15-X

MATRIX PRODUCTS

Models 1M, 1MR, 101M and 101MR

StacoSwitch Matrix products, Models 1M/1MR and 101M/101MR Lighted Pushbutton Switch/Indicators, provide a complete switching system enclosed in a single integrated housing. Custom housing configurations may consist of any number of switch/indicator channels. The compact design groups all switching functions, saving panel space and reducing installation time and cost since only one panel cutout is required. A broad selection of switch and display options provides designers with maximum flexibility in circuit control.

Matrix Housing

Constructed of square or rectangular aluminum tubes, the lightweight yet rugged housing actually strengthens the panel regardless of cutout size. Models 101M and 1M have 3/4" square channels; Models 101MR and 1MR have 3/4" X 1" rectangular channels. Square and rectangular channels can be intermixed on the 3/4" side. Spacer bars can also be located between rows of channels for additional spacing. All channels are securely bonded together and further strengthened by the housing mounting flange or dress bezel. The Model 1M Matrix Housing is QPL listed under M24317/9. All other housings meet or exceed the requirements of this Military Specification.

Plug-in Components

The Model 1M Matrix Housing accepts the 3/4" square Model 40M Switch/Indicator Module, while the Model 101M Housing accepts the 3/4" square Model 401M Switch/Indicator Module. Both accept the Model 40 Display Pushbuttons. If the rectangular configuration is desired, the Model 1MR Matrix Housing accepts the 3/4" X 1" rectangular Model 40MR Switch/Indicator Module, while the Model 101MR Housing accepts the 401MR Switch/Indicator Module. Both accept the Model 40R Display Pushbutton. Each component...housing, module, pushbutton...is ordered separately by its own Part Number Code.

Front Panel Servicing

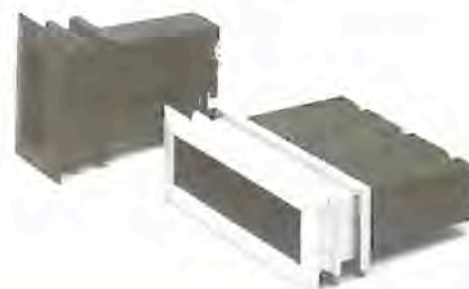
Plug-in Switch/Indicator Modules can be replaced from front of panel without disturbing behind the panel wiring. A jackscrew facilitates insertion and removal of the modules. Clockwise jackscrew rotation firmly pulls the switch/indicator module into a mating receptacle, seating the module and assuring proper electrical contact. Counter-clockwise jackscrew rotation disengages the module from the receptacle for removal. Plug-in Display Pushbuttons are quickly relamped from front of panel without tools. By moving the module latch-lever to the right the pushbutton is disengaged and can be removed from the panel.

Mounting Styles

Matrix housings are available with rear mount slotted hole flanges, or with front mount Dress Bezel. The rear mount flanges can be located top and bottom, both sides, or on all four sides of the housing. RFI shielding is available on the housing, modules, and pushbuttons



Front mount Dress Bezels, available in clear or black anodize, RFI/EMI coating, or special order color, allow the housing assembly to be inserted through the panel opening from front of panel. Mounting cleats, inserted from rear of panel, are tightened against the panel securely fastening the entire assembly in place. In addition to greatly simplifying installation, the attractive Dress Bezel is compatible with most machine console designs.

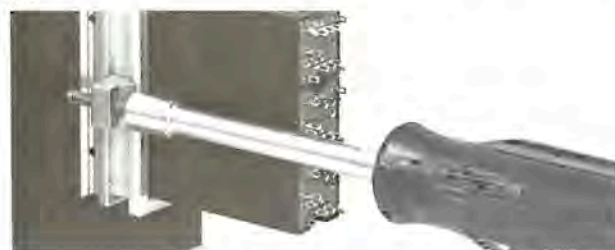


Termination Options

All housings are supplied with the termination receptacle installed at the rear of each channel. The Model 1M and 1MR Matrix Housings are available with choice of PC board, solder, or wire wrap termination receptacles. The Model 101M and 101MR Matrix Housing termination receptacles accept male crimp pin connectors on #22 wire.

Self-Locking Mounting Cleats

Mounting cleats with self-locking screws securely hold matrix and dress bezel in place even when panel opening is cut slightly oversize.



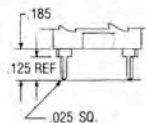
MATRIX HOUSING TERMINATION RECEPTACLES

PC, Solder or Wire Wrap 1M and 1MR

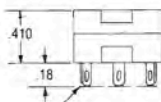
PC board, solder, or wire wrap termination receptacles are normally furnished as part of the matrix housing. Single plane wiring, with all lamp and switch terminals on the same level, greatly simplifies installation. Receptacle can be wired in the housing or may be pre-wired and installed later in the housing by inserting from back and crimping the housing retaining tabs. No special tools are required. The same receptacles fit both matrix styles-1M(square) and 1MR(rectangular).



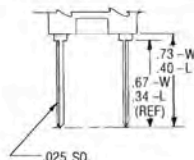
Style P
Printed Circuit Terminal



Style S
Solder Terminal

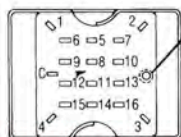


Style W
Wire Wrap Terminal



Terminal Layout

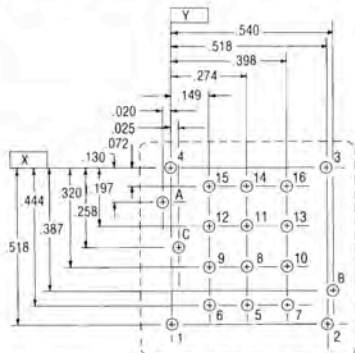
Receptacles used in all stations regardless of type of switch or indicator module. (Terminals A and B are only applicable to magnetically held modules.)



Mounting screw location for Switch/Indicator module.

Printed Circuit Board Layout

PC board hole layout, mates with PC terminations on the Style
"P" termination receptacle. .036" dia. holes viewed from
component side of board. (tolerances $\pm .005$ " to be non-
cumulative).



4PDT switch shown. If 2PDT, delete holes 8-13. If MAG held switch use holes A and B. If IND delete 5-16, A and B.

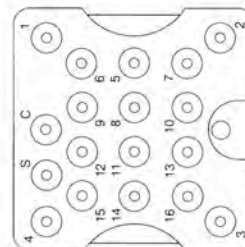
Crimp Pins 101M and 101MR

Male crimp pins attached to connector wires, eliminating all soldering or wire wrapping, are inserted in termination receptacle located at rear of each control channel. Terminal openings are clearly numbered for identification. Crimp pin is firmly held in place by receptacle retainer with a retention force of 20 pounds. Rubber glandular grommet forms tight closure around each wire. Unused termination openings can be closed off with insulator plugs. Simple insertion and removal tool facilitates wiring. Standard M22520/1 Crimping Tool and Turret are used to attach male connector pin to wires.



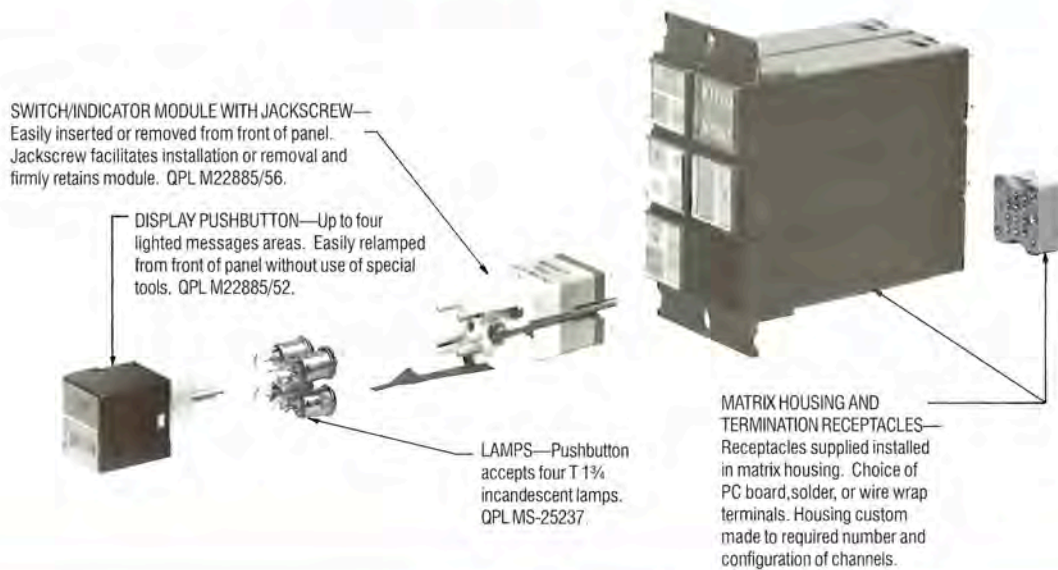
Terminal Layout

Receptacles used in all stations regardless of type of switch or indicator module.



MATRIX HOUSING TERMINATION RECEPTACLES

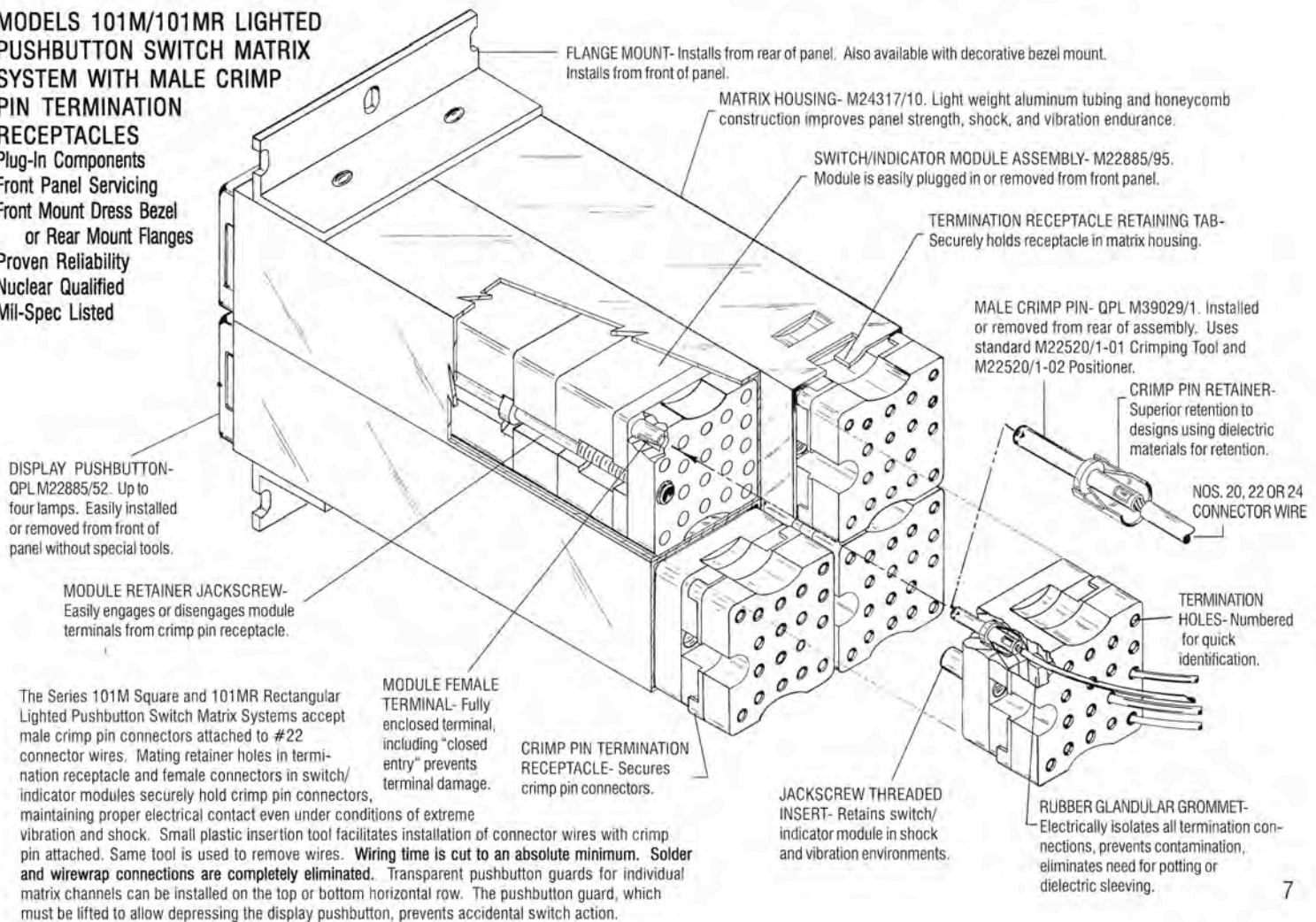
PC, Solder or Wirewrap Exploded View



Crimp Pin Exploded View

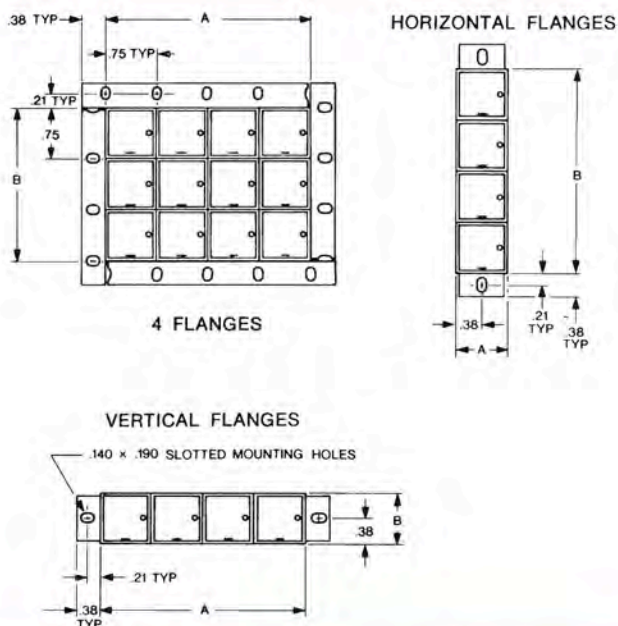
MODELS 101M/101MR LIGHTED PUSHBUTTON SWITCH MATRIX SYSTEM WITH MALE CRIMP PIN TERMINATION RECEPTACLES

- Plug-In Components
- Front Panel Servicing
- Front Mount Dress Bezel or Rear Mount Flanges
- Proven Reliability
- Nuclear Qualified
- Mil-Spec Listed

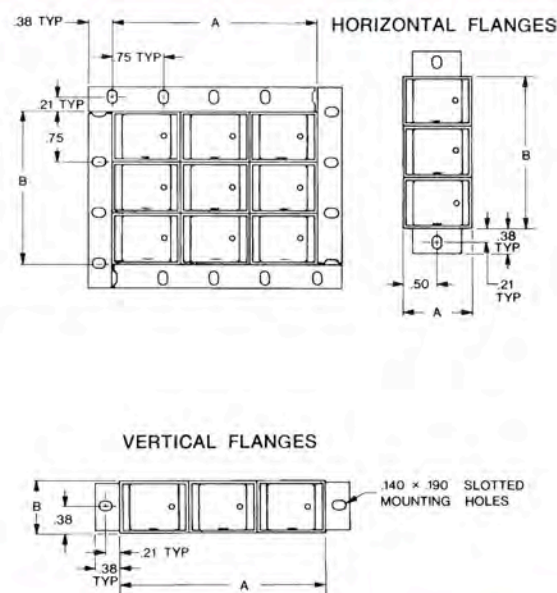


DIMENSIONS - REAR MOUNT FLANGE

101M AND 1M

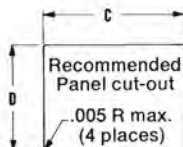


101MR AND 1MR



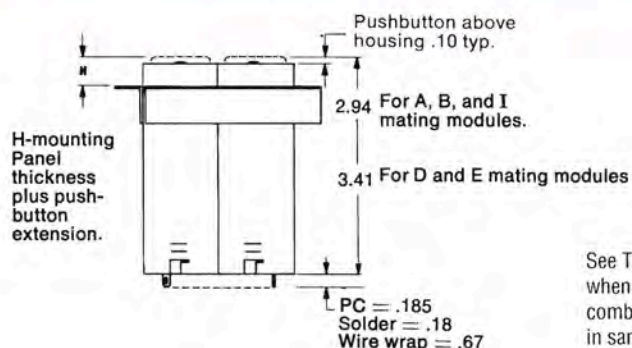
Recommended Panel Mounting Detail

Number of Units on Side	Dim. A or B ±.015	Cut-Out Dimension C or D +.030 -.000
1	.755	.775
2	1.510	1.530
3	2.265	2.285
4	3.020	3.040
5	3.775	3.795
N	.755xN	.755xN +.02



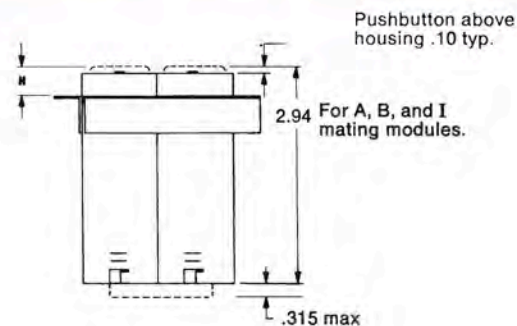
Number of Units on Side	Matrix Dimension A ±.015	Matrix Dimension B ±.015	Cut-out Dimension C +.030/-0.000	Cut-out Dimension D +.030/-0.000
1	1.005	.755	1.025	.775
2	2.010	1.510	2.030	1.530
3	3.015	2.265	3.035	2.285
4	4.020	3.020	4.040	3.040
5	5.025	3.775	5.045	3.795
6	6.030	4.530	6.050	4.550
N	1.005xN	.755xN	N(1.005) +.020	N(.755) +.020

1M AND 1MR - Housing



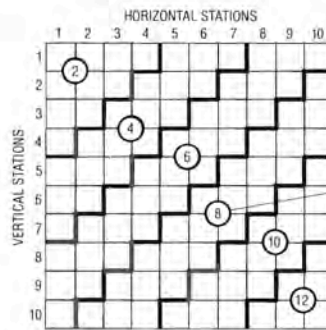
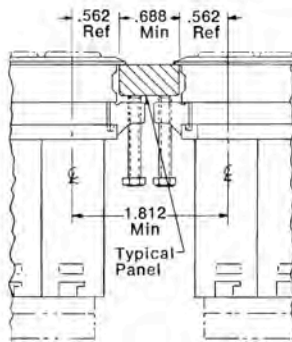
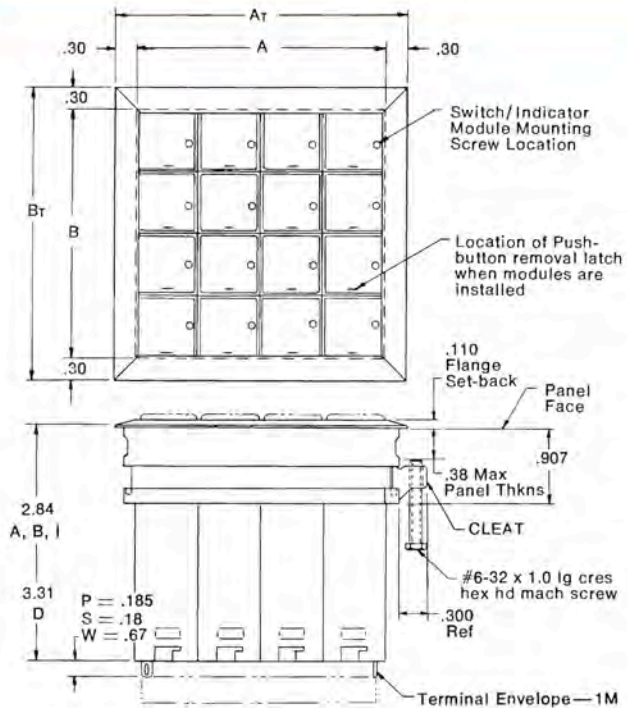
See Technical Bulletin 1211-2 when D and E modules are combined with A, B, or I modules in same matrix housing.

101M AND 101MR - Housing



DIMENSIONS - MOUNTING DRESS BEZEL

101M and 1M

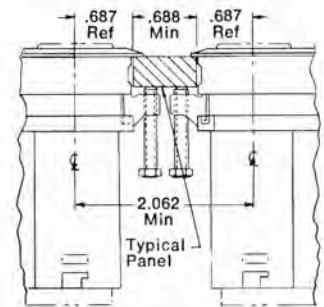
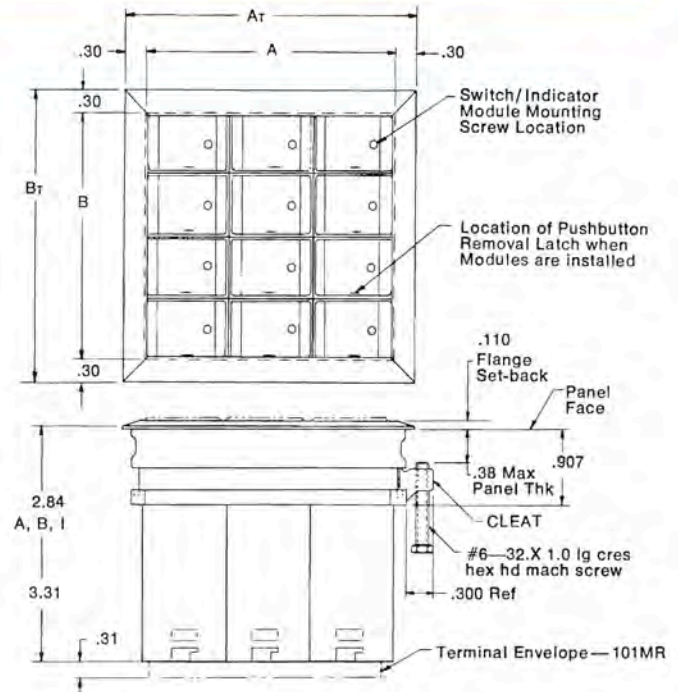


Number of mounting cleats supplied, per size of matrix housing.

Quantity of mounting cleats

Cleats to be equally spaced around matrix housing bezel. Self-locking screws are secured at 7 inch pounds max. CAUTION—do not exceed recommended torque.

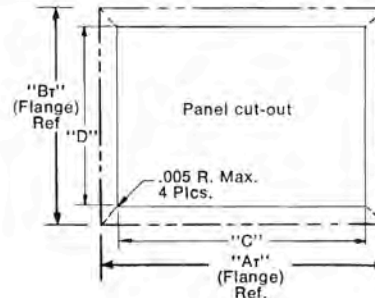
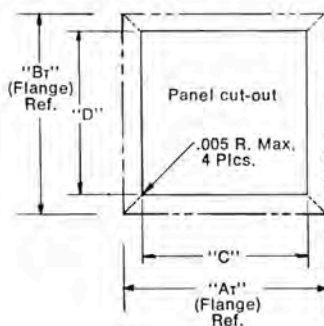
101MR and 1MR



Recommended Panel Mounting Detail

Number of Units Per Side	Matrix Dimension "A" or "B" +.010 - .000	Cut-Out Dimension "C" or "D" +.030 - .000	"Ar" or "Br" Ref. Overall Flange
1	.755	1.124	1.352
2	1.510	1.879	2.107
3	2.265	2.634	2.862
4	3.020	3.389	3.617
5	3.775	4.144	4.372
6	4.530	4.899	5.127
"N"	.755 x "N"	Dim. "A" or "B" Plus .369	Dim. "Ar" or "Br" Plus .597

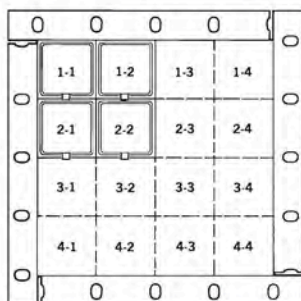
Number of Units Per Side	Matrix Dimension		Cut-out Dimension		Overall Flange "Ar" Ref.	Overall Flange "Br" REF.
	+ .010 "A" - .000	+ .010 "B" - .000	+ .030 "C" - .000	+ .030 "D" - .000		
1	1.005	.755	1.374	1.124	1.602	1.352
2	2.010	1.510	2.379	1.879	2.607	2.107
3	3.015	2.265	3.384	2.634	3.612	2.862
4	4.020	3.020	4.389	3.389	4.617	3.617
5	5.025	3.775	5.394	4.144	5.622	4.372
6	6.030	4.530	6.399	4.899	6.627	5.127
"N"	1.005 x "N"	.755 x "N"	Dim. "A" Plus .369	Dim. "B" Plus .369	Dim. "A" Plus .597	Dim. "B" Plus .597



ORDERING SYSTEMS

When ordering complete systems...matrix housing, switch/indicator modules, and pushbuttons...an Assembly Part Number can be assigned by the factory to cover the complete system.

Each Channel or station within the matrix must be identified by a specific switch or indicator module and a Pushbutton Display Screen. Each station in the matrix is identified by a digit-dash-digit, called a Location Code.



The first digit in the Location Code identifies the horizontal row and the second digit identifies the vertical column. In the example 2-2 is the second row down and the second column to the right. Location 1-1 will always be top left as viewed by the OPERATOR. Pre-numbered work sheets are available from the factory on request.

HOUSING ASSEMBLY P/N 1M/1MRXXXXXX/XXX

LOCATION	SWITCH/INDICATOR MODULE PART NUMBER. See page 15-16.	PUSHBUTTON/DISPLAY SCREEN PART NUMBER. See page 22.
1-1		
1-2		
1-3		
4-2	NOTE: Pre-numbered system worksheets available upon request.	
4-3		
4-4		

With Crimp Pin Termination

Typical Part Number
101M 03 04 N 22 - 2 STACOSWITCH
Customer Code

Assembly Part Number

Assigned by StacoSwitch defines customer specific assemblies

- 1 = Horizontal flange, rear mount
- 2 = Vertical flange, rear mount
- 3 = Four flange configuration, rear mount
- X = No flange required
- 5 = Bezel, front mount, black anodize
- 7 = Bezel, front mount, clear anodize
- 9 = Bezel, front mount, RFI/EMI/irridite
- C = Bezel, front mount, colored finish

Flange set back in two-place decimal increments. Dimension "H" .110" fixed for front mount bezel. Use "11" as standard

Shield options: N=Non-shielded, black anodize finish. R=RFI/EMI shielded, irridite finish. (Dress bezel requires RFI/EMI shielding)

Number of vertical stations

Number of horizontal stations

Matrix Model: 101M=Square stations. 101MR=Rectangular stations

With PC, Solder or Wire Wrap

Typical Part Number
1MR 03 04 N 11 S - Z STACOSWITCH
Customer Code

Assembly Part Number

Assigned by StacoSwitch defines specific customers assemblies

- 1 = Horizontal flange, rear mount
- 2 = Vertical flange, rear mount
- 3 = Four flange configuration, rear mount
- X = No flange required
- 5 = Bezel, front mount, black anodize
- 7 = Bezel, front mount, clear anodize
- 9 = Bezel, front mount, RFI/EMI/irridite
- C = Bezel, front mount, colored finish

Receptacle terminals: P=PC board, S=Solder lug,

W=Wire wrap -.73 length, L=Wire wrap - .40 length

Flange set back in two-place decimal increments. Dimension "H" .110" fixed for front mount bezel. Use "11" as standard

Shield options: N=Non-shielded, black anodize finish. R=RFI/EMI shielded, irridite finish. (Dress bezel, requires RFI/EMI shielding)

Number of vertical stations

Number of horizontal stations

Matrix Model: 1M=Square stations. 1MR=Rectangular stations

NOTE: When specifying housing assemblies that accommodate both D and E switch modules and/or split lamp grounds the intended location in matrix assembly must be designated.

MODEL 40 SWITCH INDICATOR MODULES

The dependable, and long proven StacoSwitch snap action switch mechanism is used in all switch modules. Design qualifications, premium grade materials and precious metal contacts assure reliable, trouble-free operation. Providing 4-lamp capability with 2PDT and 4PDT circuits, the plug-in modules offer a wide switching range from 2 amp resistive down to 10 micro amp computer keyboard capability. Common or split lamp grounds are available on either model. Switch module is easily removed and replaced from the front of the panel for servicing. Positive mating of module and termination receptacle is provided by a retainer jackscrew which also facilitates insertion and removal of the module.

Model 40M/40MR



Used in Models 1M/1MR Matrix Housings these modules mate with termination receptacles at rear of each channel. The square Model 40M Module is available in indicator only as well as momentary, alternate, latchdown alternate, and magnetically held for those applications requiring remote control. The rectangular 40MR Module is available in indicator only, momentary action, alternate action, and magnetic held.

Model 401M/401MR



These modules accept male crimp pin terminals on #20, 22, 24 wires. The square Model 401M is used with the Model 101M Matrix Housing. In addition to the indicator only module, used as a warning light, available switch actions include momentary for trigger functions, alternate for maintained "off" and "on" function, and latchdown alternate where physical indication of switch operation is required. The rectangular Model 401MR Modules is used with the Model 101MR Matrix Housing. In addition to indicator only, switch actions available are momentary and alternate.

Specifications

ELECTRICAL

Contact Ratings	28 VDC	115 VAC
Resistive	2 AMPS	2 AMPS
Inductive	1 AMP	1 AMP
Lamp	.75 AMPS	.75 AMPS
Dry Circuit	10 Microamps	
Life at rated load	25,000 cycles min.	
Contact resistance, initial	Switch-.025 ohms max. lamp-1.0 ohms max.	
Dielectric Strength	Sea level-1,000vrms	
Insulation resistance	1000 megohms @ 500 VDC	

SOLENOID COIL-MODEL "D"

Coil voltage, nominal	28 VDC
Coil hold-in minimum	20 VDC
Coil resistance	420 ohms $\pm 10\%$ @ 25°C
Duty cycle	continuous

MECHANICAL

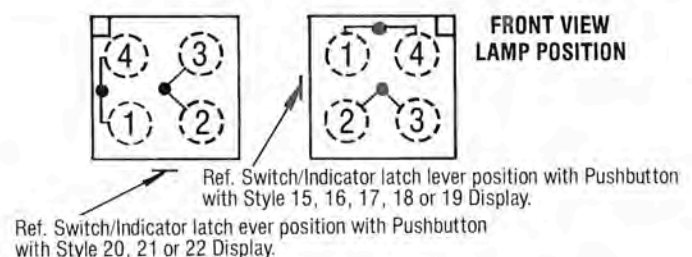
Actuation force	3.5 ± 1.0 pounds
Actuation travel	
Models "A", "B", "D", AND "I"	.200 inch max.
Model "E"	.420 inch max.
Weight	
Models "A", "B", AND "I"	.032 pounds $\pm 10\%$
Model "D"	.059 pounds $\pm 10\%$
Model "E"	.045 pounds $\pm 10\%$
Life	50,000 mechanical cycles minimum.
Mounting Torque	8 oz. in.

ENVIRONMENTAL

Applicable Military Specifications MIL-S-22885 Salt Spray, Moisture Resistance, Thermal Shock, Vibration, Sand and Dust and Fungus Resistance.

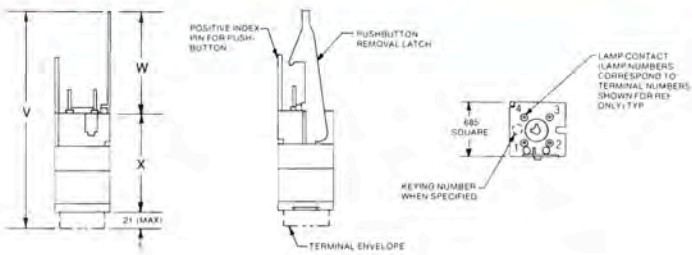
Split Lamp Ground

For square Models 401M and 40M vertical 2-way split lamp ground the switch/indicator module is mounted with the latch lever at bottom of matrix station. For a horizontal 2-way split the module is positioned so that latch lever is at left side of the matrix station. Location of split lamp ground modules in matrix must be indicated when ordering the matrix.



MODEL 40 SWITCH INDICATOR MODULES

40M Dimensions



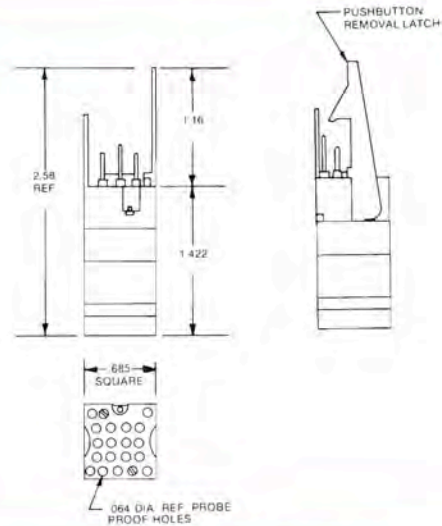
40M MODELS

DIM.	"A", "B", "I"	"D"	"E"
V	2.60	3.13	3.10
W	1.15	1.07	1.58
X	1.25	2.06	1.52

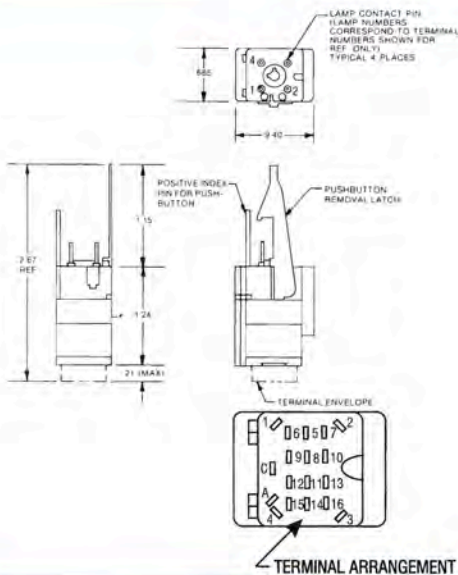


TERMINAL ARRANGEMENT

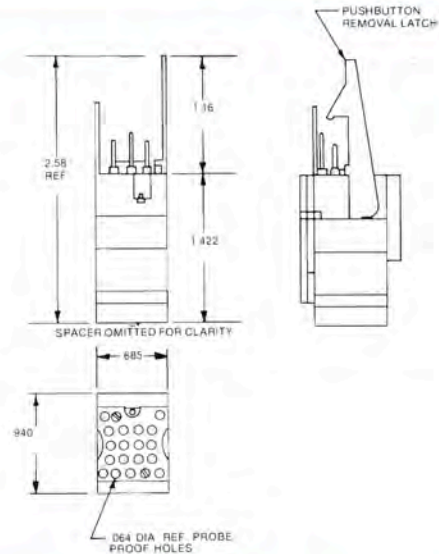
401M Dimensions



40MR Dimensions

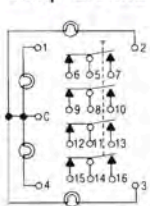


401MR Dimensions

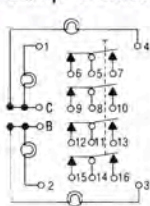


40M/40MR Schematics

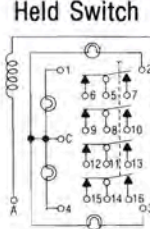
Common Lamp Ground



Split Lamp Ground

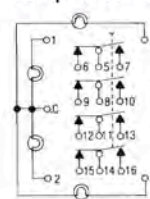


Magnetically Held Switch

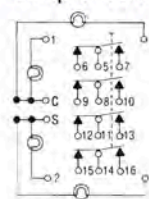


401M/401MR Schematics

Common Lamp Ground



Split Lamp Ground



4PDT pushbutton switch schematic shown. For 2PDT omit terminals 8-13. For indicator only omit terminals 5-16. Order matching ground on display pushbutton. Split lamp ground not available on magnetically held switch.

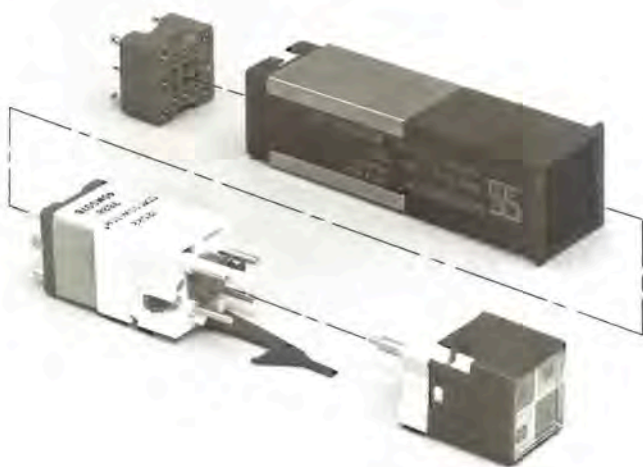
4PDT pushbutton switch schematic shown. For 2PDT omit terminals 8-13. For indicator only omit terminals 5-16. Order matching ground display pushbutton.

MODEL 49/491 LIGHTED PUSHBUTTON SWITCH/INDICATOR

Models 49 and 491 are individually mounted switch/indicators offering the same design features and advantages as the Model 1M and 101M Matrix Mounted System. Clamp sleeve mounted, the switch housing and termination receptacle mounts in a .750" square panel opening. Both the switch/indicator module and the display pushbutton are plugged in and serviced from the front of the panel without use of special tools. No need to touch behind the panel wiring. Choice of indicator only or momentary or alternate switch action in either 2PDT or 4PDT, with either common or split lamp ground.

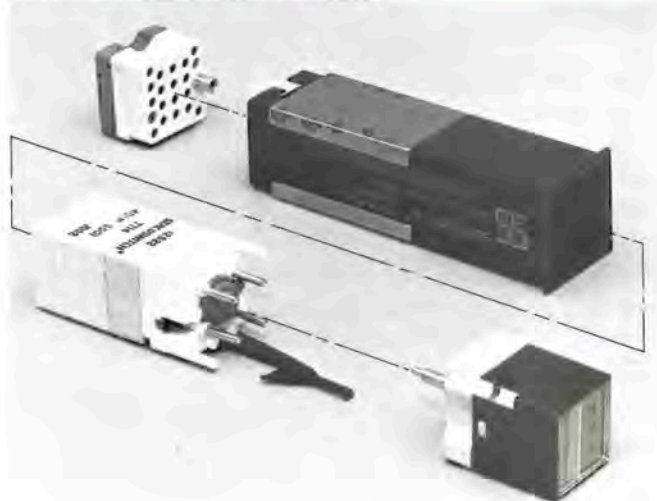
Model 49

Choice of solder lug or wire wrap terminations.



Model 491

Male crimp pins on #20, 22, 24 wire are inserted in termination receptacle at rear of switch housing.



Specifications

ELECTRICAL

Contact Ratings

	28 VDC	115 VAC
Resistive	2 AMPS	2 AMPS
Inductive	1 AMP	1 AMP
Lamp	.75 AMPS	.75 AMPS
Dry Circuit	10 Microamps	

Life at rated load

25,000 cycles min.

Contact resistance, initial.

Switch-.025 ohms max.

lamp-1.0 ohms max.

Dielectric Strength

Sea level-1,000 vrms

Insulation resistance

1000 megohms @ 500 VDC

MECHANICAL

Actuation force

3.5 ±1.0 pounds

Actuation travel

.200 inch max.

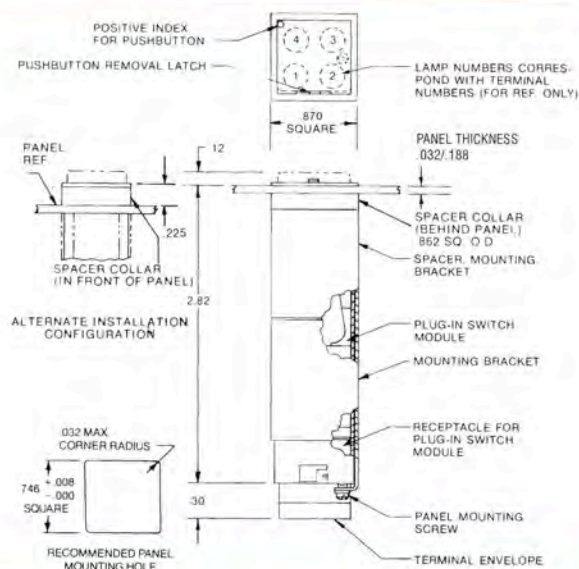
Life

50,000 mechanical cycles minimum.

ENVIRONMENTAL

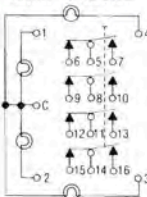
Applicable Military Specifications MIL-S-22885 Salt Spray, Moisture Resistance, Thermal Shock, Vibration, Sand and Dust and Fungus Resistance.

Dimensions



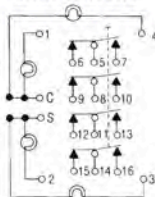
Schematics

COMMON LAMP GROUND



Pushbutton switch schematic for 4PDT shown. For 2PDT omit terminations 8-13. For indicator only omit terminations 5-16. On momentary switches contacts 6, 9, 12, and 15 are normally closed.

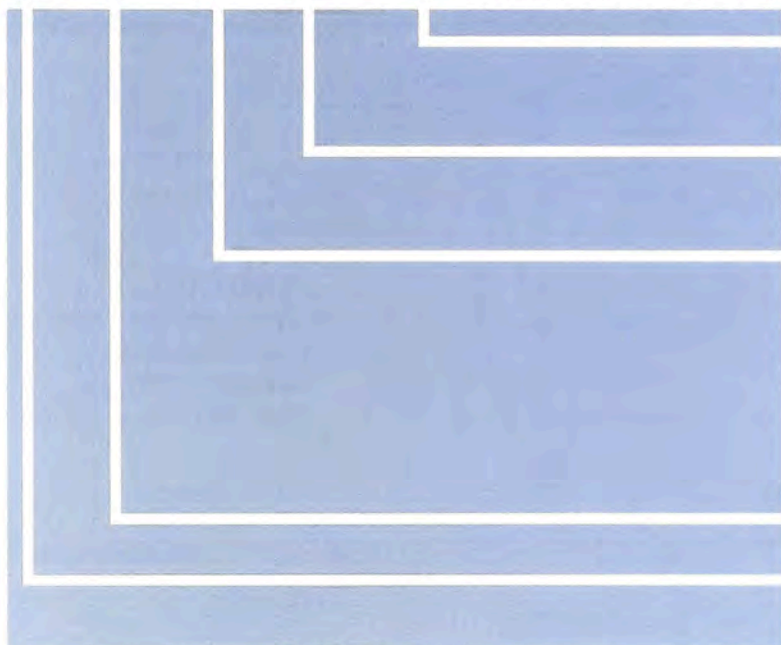
SPLIT LAMP GROUND



Model 49 shown; Terminal S on Model 491 split lamp ground is indicated as Terminal A.

40M/401M/40MR/401MR AND 49/491 ORDERING INFORMATION

40M S 08 A -52 EXAMPLE: TYPICAL PART NUMBER



Two digit number (01 thru 60) specifying positive keyed hub. Must match keying number of mating pushbutton. Omit for non-keyed. (40M/401M only.)

A = Momentary; B = Alternate; I = Indicator

D = Magnetic held (40M/40MR only); E = Latchdown (40M only)

Circuit:

07 = 2PDT/CLG; 08 = 4PDT/CLG

09 = 2PDT/SLG; 10 = 4PDT/SLG

00 = Indicator/CLG

11 = Indicator/SLG

CLG = Common lamp ground;

SLG = Split lamp ground,

not available "D" magnetic held.

S = Moisture tight; N = Unsealed

Matrix Plug-in Module:

40M/401M = square, 40MR/401MR = rectangular

49 S 08 A S EXAMPLE: TYPICAL PART NUMBER



S = Solder lug type

W = Wire wrap type

A = Momentary, B = Alternate, I = Indicator only,

X = No module (hsg. only)

07 = 2PDT/CLG, 08 = 4PDT/CLG

00 = Indicator/CLG

12 = 2PDT/SLG, 13 = 4PDT/SLG

14 = Indicator/SLG, XX = No module (hsg. only)

CLG = Common Lamp Ground

SLG = Split lamp ground

S = Moisture tight

Model number. Prefix "R" in front of model number (R49) denotes RFI/EMI shielded switch body. Note: Pushbutton ordered seperately. Refer to Series 40 Display Pushbutton.

491 S 08 A EXAMPLE: TYPICAL PART NUMBER



A = Momentary, B = Alternate

I = Indicator only, X = No module (hsg. only)

07 = 2PDT/CLG, 08 = 4PDT/CLG

00 = Indicator/CLG

09 = 2PDT/SLG, 10 = 4PDT/SLG

11 = Indicator/SLG, XX = No module (hsg. only)

CLG = Common lamp ground

SLG = Split lamp ground

S = Moisture tight

Model number. Prefix "R" in front of model number (R491) denotes RFI/EMI shielded switch body. Note: Pushbutton ordered seperately. Refer to Series 40 Display Pushbutton.

MODELS 40/40R SWITCH/INDICATORS



PROVEN DEPENDABILITY

Model 40 square and Model 40R rectangular illuminated Pushbutton Switch/Indicators provide the switching capabilities and message versatility to meet the most exacting requirements. Ruggedly dependable, the proven switch mechanism assures long service life and trouble-free operation. Both Switch/Indicators have a long history of successful service on high performance aircraft, naval applications, ground control equipment, and critical industrial and medical installations demanding maximum performance.

MIL-SPEC

Model 40 Switches are listed under M22885/56, complying with all Military Specifications for salt spray, moisture resistance, thermal shock, vibration, sand and dust, and fungus resistance. Switches are Seismic Qualified under IEEE Standard 344-1975 and TVA Appendix "C".

SQUARE OR RECTANGULAR SWITCH/INDICATOR

Models 40 and 40R offer the same design features and advantages. Identical switch mechanisms are used in both; the only difference is the 40R is rectangular while the 40 is square. Contact materials are high conductivity precious metal alloys, gold plated. Up to four pole double throw switching with choice of switch action and a switching range from 2 amp resistive power switch rating, down to 10 micro amp computer capability for maximum control flexibility.

CHOICE OF SWITCH ACTION

In addition to Indicator only, switches are available with momentary or alternate action with either 2PDT or 4PDT contact arrangement and either common or split lamp ground. Latchdown action is also available where a physical indication, in addition to the lighted legend, is desired. Solenoid-held action are for those applications requiring remote control or electrical inter-lock.

EASY INSTALLATION

Mounting is simple and secure. Spacer collar on mounting sleeve allows switch/indicator to be mounted either flush to the front panel or extended, for use with edge-lit or similar overlay panel. Switch is simply inserted into the mounting hole from front of the panel and the mounting sleeve is then slid onto the switch housing from the back of the panel and the retaining screw tightened, securely clamping the switch to the panel. All lamp and switch terminations are on the same plane for ease of wiring.

OTHER FEATURES

Switches and indicators can be supplied with a keying feature that allows them to be used only with an identically keyed pushbutton. This feature guards against the possibility of a pushbutton being inserted in the wrong switch. RFI/EMI shielded switches and indicators are also available, in conjunction with RFI/EMI shielded pushbuttons.

MODEL 40/40R SWITCH/INDICATORS

Specifications

These switches and indicators meet or exceed all applicable requirements of MIL - S-22885

ELECTRICAL

Contact Ratings

	28 VDC	115 VAC
Resistive	2 AMPS	2 AMPS
Inductive	1 AMP	1 AMP
Lamp	.75 AMPS	.75 AMPS
Dry Circuit	10 Microamps	

Life at rated load
Contact resistance, initial.

25,000 cycles min.
Switch-.025 ohms max.
lamp-1.0 ohms max.
Sea level-1,000 vrms
1000 megohms @ 500 VDC

Dielectric Strength
Insulation resistance

SOLENOID COIL-MODEL "D"

Coil voltage, nominal	28 VDC
Coil hold-in minimum	20 VDC
Coil resistance	420 ohms $\pm 10\%$ @ 25°C
Duty cycle	continuous

MECHANICAL

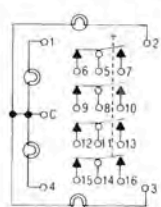
Actuation force	3.5 ± 1.0 pounds
Actuation travel	
Models "A", "B", "D", AND "I"	.200 inch max.
Model "E"	.420 inch max.
Weight	w/ pushbutton & lamps .097 pounds (40R) .073 pounds (40) switch .053 pounds (40) indicator

ENVIRONMENTAL

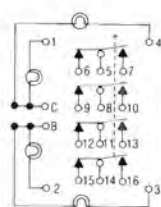
Applicable Military Specifications MIL-S-22885 Salt Spray, Moisture Resistance, Thermal Shock, Vibration, Sand and Dust and Fungus Resistance.

Switch Schematics

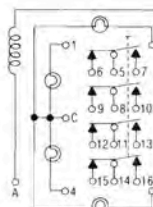
Common
Lamp Ground



Split
Lamp Ground

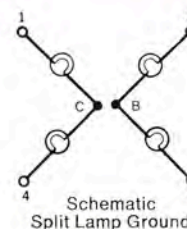
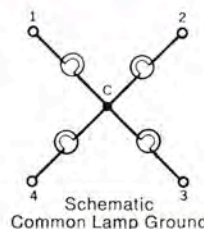


Magnetically
Held Switch

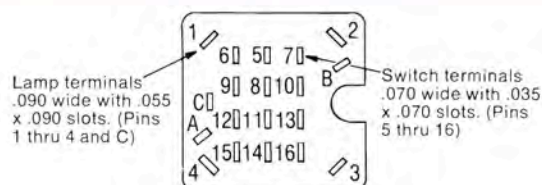


Pushbutton switch schematic 4PDT Shown.
For 2PDT, Omit terminals 8-13. For Indicator, Omit terminals 5-16.

Indicator Schematics



Terminal Arrangement

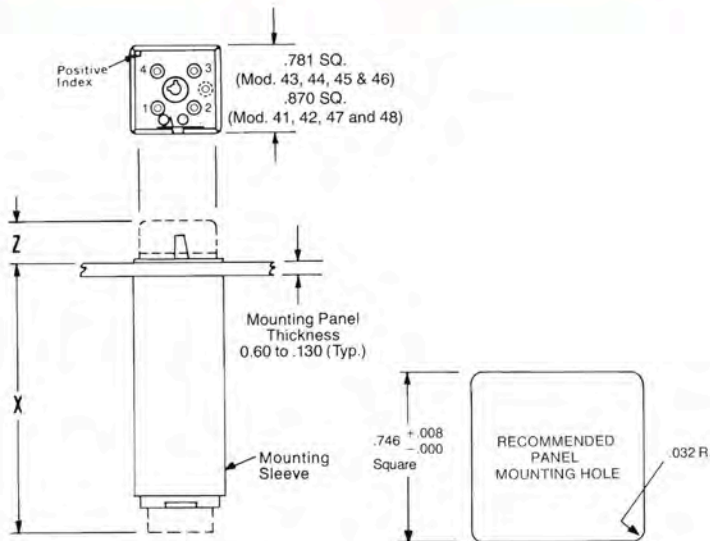


4PDT shown. For 2PDT, omit terminals 8-13. For Indicator omit terminals 5-16. Terminals A and B applicable to magnetically held. Terminals B and C applicable to split lamp ground.



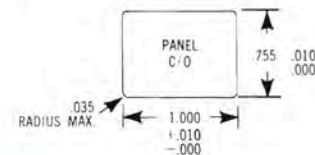
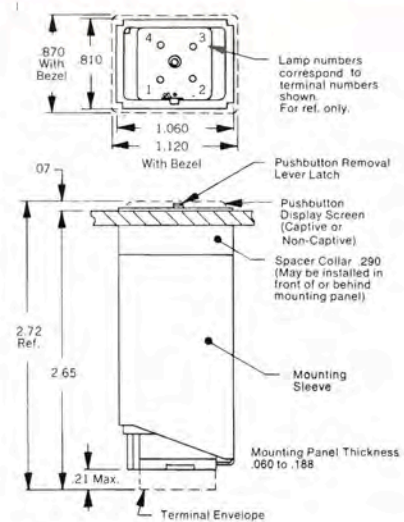
MODELS 40/40R SWITCH/INDICATORS

Model 40 Dimensions



	Models 45, 47, 41, 43				Models 46, 43, 42, 44			
DIM	A,B	D	E	I	A,B	D	E	I
X	2.65	3.08	3.11	1.81	2.36	2.79	2.82	1.52
Z	.070	.070	.070	.070	.360	.360	.360	.360

Model 40R Dimensions



Ordering Information

46 S 08 B- 19

Two digit number (01 through 60) specifying positive keyed hub. Must match keying number of mating pushbutton. Omit for non-keyed

SWITCH / INDICATOR

A = Momentary, B = Alternate, D = Solenoid Held, E = Latchdown, I = Indicator

CIRCUIT CONFIGURATION

07 = 2PDT/CLG, 08 = 4PDT/CLG, 09 = 2PDT/SLG, 10 = 4PDT/SLG, 00 = Common Lamp Ground, 11 = Split lamp ground, CLG = Common Lamp Ground, SLG = Split Lamp Ground, not available "D" Solenoid Held.

ENVIRONMENTAL CONSTRUCTION

S = Moisture Tight N = Nonsealed

Model	Pushbutton	Mt. Centers
45, 43	Flush	.814 min.
46, 44	Extended	.814 min.
47, 41	Flush	.875 min.
48, 42	Extended	.875 min.

Prefix "R" in front of model number (R46) denotes RFI shielded switch body.

Ordering Information

40R A S 08 A

Momentary = "A", Alternate Action = "B"; Indicator Only = "I"

07 = 2PDT/CLG; 08 = 4PDT/CLG; 09 = 2PDT/SLG; 10 = 4PDT/SLG; 00 = Indicator Only/CLG; 11 = Indicator Only/SLG, CLG = Common Lamp Ground, SLG = Split Lamp Ground

S = Moisture Tight; N = Unsealed

Bezel; A = Clear anodize; B = Black Anodize; X = No Bezel

Rectangular model number. Prefix "R" in front of model number (R40R) denotes RFI shielded switch body.

SQUARE OR RECTANGULAR PUSHBUTTON

DISPLAY PUSHBUTTON

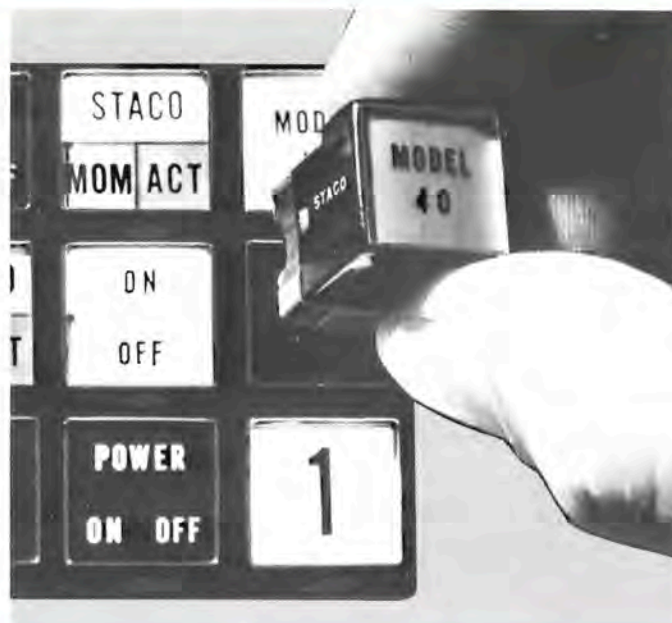
Model 40 square or Model 40R rectangular Display Pushbuttons should be ordered to mate with their square or rectangular switch/indicator bases. The rectangular model 40R Display Pushbutton provides a larger frontal area to accommodate longer legends. Display Pushbuttons must be ordered separately. Pushbuttons are available with common lamp ground or split lamp ground in four choices of lamp arrangement. If split lamp ground is required, both pushbutton and switch/indicator must be so ordered. Pushbutton accepts four T-1 3/4 lamps and can be relamped from front of the panel without use of tools. Lamps must be ordered separately.



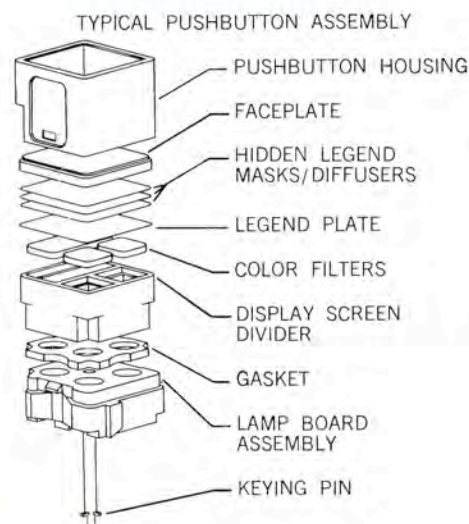
STANDARD DISPLAY OPTIONS

Choice of 7 legend illumination display types, eight display screen styles, and six colors for legend or background add up to countless standard display combinations all available as standard options. Design engineers are offered a wide range of configurations and color combinations for distinctive message displays. One to four levels of information can be displayed individually or in combination within each switch channel.

StacoSwitch's lens combinations provide controlled color diffusion and great light transmission. Designer matched colors enhance display appearance and contribute to increased operator efficiency. For critical lighting areas, such as high glare or low ambient light conditions, optional high contrast and non-glare face plates provide optimum readability. Legend copy is limited only by space available on the display screen. All pushbuttons can be relamped from front of panel.



Pushbutton Assembly



OPTIONAL FEATURES

The Model 40 Pushbutton can be supplied with a keying feature that will allow it to be used only with an identically keyed switch/indicator module. This guards against insertion of the pushbutton in the wrong matrix channel. The Model 40R pushbutton can be supplied with a captive bail which allows the pushbutton to be removed from the front of the panel for relamping, yet retaining it to the mating switch/indicator module at all times. If the pushbutton is to be removed entirely from the panel, the bail can be quickly disengaged. RFI shielding is available in conjunction with the RFI housing.

MODEL 40 PUSHBUTTON

Display Screens - 1

Pushbutton/Displays for all matrix and individual mount switch/Indicators except latchdown.

MATRIX AND INDIVIDUAL MOUNT



NON-RFI

Pushbutton Model	Lamp Ground
T	Common
J	Split

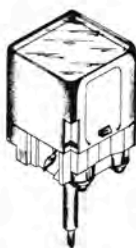
MATRIX AND INDIVIDUAL MOUNT RFI



NOTE   RFI

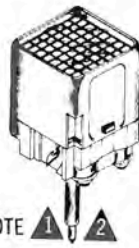
Pushbutton Model	Lamp Ground
U	Common
L	Split

Pushbutton/Display for all matrix and individual mount latchdown switches.



NON-RFI

Pushbutton Model	Lamp Ground
W	Common
N	Split



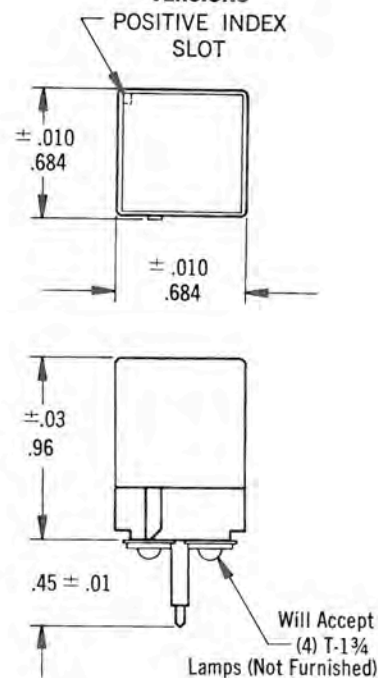
NOTE   RFI

Pushbutton Model	Lamp Ground
Y	Common
P	Split

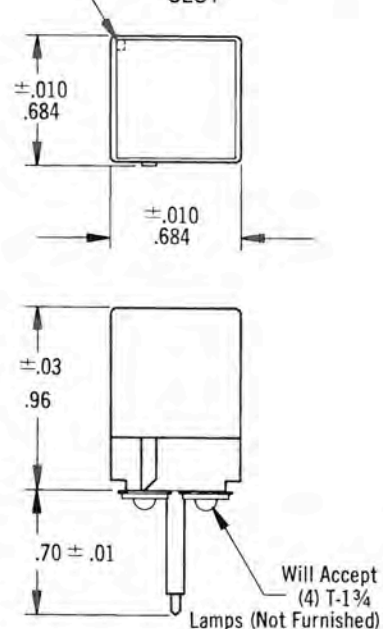
NOTES:  RFI - shielded matrix is required
 RFI - shielded switch body is required

Dimensions

"A, B, D, I" VERSIONS



"E" VERSIONS



MODEL 40 PUSHBUTTON

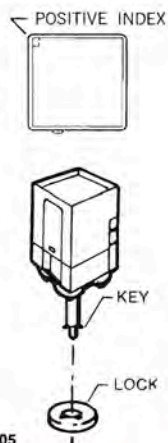
Indexing and Keying - 2

Pushbuttons are indexed to the Switch/Indicator modules for display orientation as a standard feature.

Pushbuttons can be provided with a keying feature that will allow only identically keyed Switch/Indicators and pushbuttons to mate. Up to 60 non-interchangeable key positions are available.

In preparing the part number, use 00 if keying is not required. If keying is required, use numbers 01,02,03...through 60.

EXAMPLE WITH KEYING: 40 Y 24 1 22 - G B R X 805



Display Types - 3

Type descriptions:

1. Black legend on translucent color background.
2. Black Legend visible only with background color illuminated. Background is white when non-illuminated.
3. Translucent color legend on black background.
4. Translucent legend visible in color against opaque background when illuminated. Background is translucent white non-illuminated with legend not visible.
5. Black legend on white translucent background. Legend engraved on external surface. Background color visible when illuminated.
6. White translucent legend on black background. Legend visible in color when illuminated.
8. Black legend on white translucent background. Background color visible only when lamps illuminated.

Lamp off	1	2	3	4	5	6	8
Lamp on	1	2	3	4	5	6	8

Display Styles - 4

Pushbutton display screens are available in eight styles of screen splits, 15 through 22. Legend areas are identified as 1,2,3 or 4.



Block diagram shown below, illustrates lamp positions as viewed from the front of the Pushbutton/Display screen which correlates to the lamp terminal identification at the rear of the Switch/Indicator module.



Area Color - 5

Area color is called out by a single letter code in the chart below. The area is defined by Display Styles, Section 4. The area color code portion of the Pushbutton/Display requires 4 letters. When any of these areas are not applicable, insert X in that space. Colors are in accordance with MIL-S-22885/54, red

Area Color	Blue	Green	Red	White	Amber	Yellow
Color Code	B	G	R	W	A	Y

MODEL 40 PUSHBUTTON

Legend Arrangement - 6

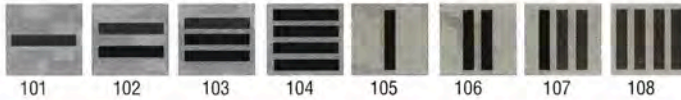
Illustrations of legend arrangement and part numbers are shown in the following block diagrams. The first block designates no legend and should be included in the part number if no legend is required. Standard letter height is .100.

Full Display

Horizontal rows of letters
(8 letters or spaces per row)

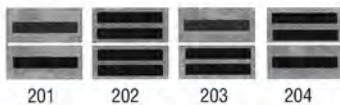


Vertical columns of letters
(5 letters or spaces per column)



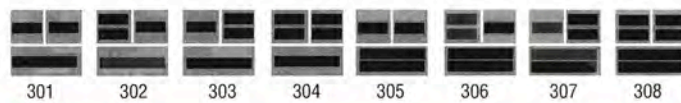
Horizontal Split

Horizontal rows of letters
(8 letters or spaces per row)



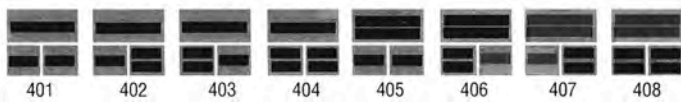
3 Way Split

Horizontal rows of letters
(3 and 8 letters or spaces per row)



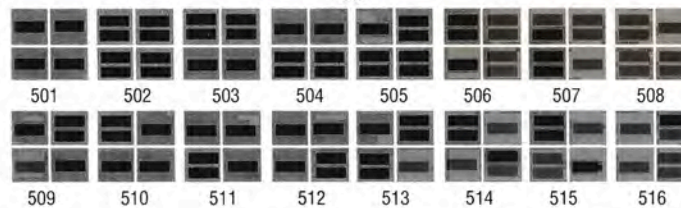
3 Way Split

Horizontal rows of letters
(3 and 8 letters or spaces per row)



4 Way Split

Horizontal columns or letters
(3 letters or spaces per row)

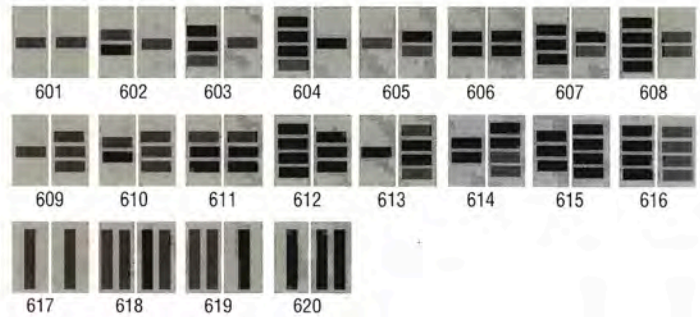


Vertical Split

Horizontal rows or letters
(3 letters or spaces per row)



Vertical columns of letters
(5 letters or spaces per column)

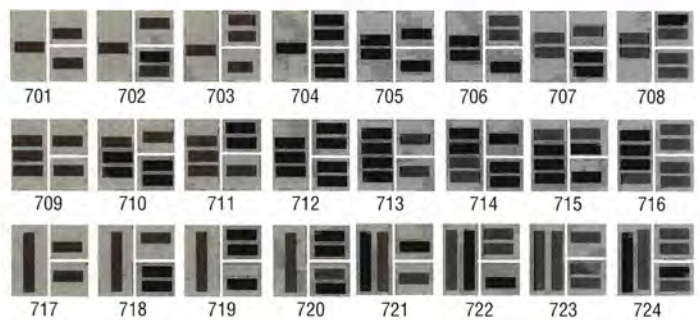


3 Way Split

Horizontal rows of letters
(3 letters or spaces per row)



Vertical columns of letters
(5 letters or spaces per column)

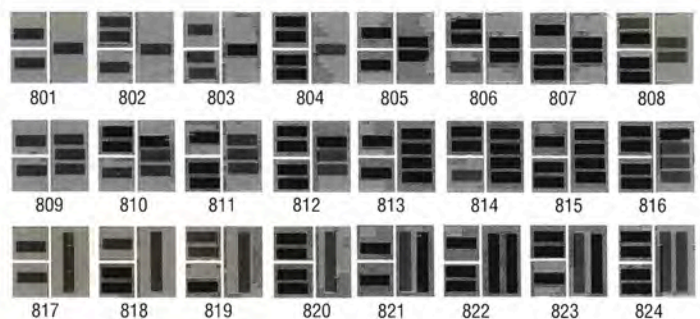


3 Way Split

Horizontal rows of letters
(3 letters or spaces per row)



Vertical columns of letters
(5 letters or spaces per column)



MODEL 40 PUSHBUTTON

Legend - 7

Legend areas should be indicated by four sets of parentheses in each part number. The first set of parentheses is Area #1, the second set, Area #2, the third set, Area #3, the fourth is Area #4.

If the legend arrangement you choose does not have four legend areas or you do not want legends in all available areas, indicate so by entering an X in that set of parentheses. Correlate legends between Section 4 and Section 6. When you have more than one row or column of words in one area, separate them by a semi-colon. Section 4 governs the location and number code of the "areas".

Example with Legend Specified

40 Y00 122-GBRX 805 (GO) (END) (OIL; OK) (X)

Display Legend Features Available

Ref. Tech. Bulletin

Non-Glare clear face plate.	
Non Glare neutral gray face plate	124-5
Optional Legends character sizes	123-1
Two color lighting of same legend.	
Multiple display types on same pushbutton; high brightness display.	124-6
High-Contrast display.	124-7

Pushbutton Display Kits

Pushbutton styles 15 through 22 and pushbutton models T, U, W, and Y are available in kit (do-it-yourself) configurations. Each kit allows you to change color filters, legends and type of legend display (types 1 through 8 only). Each kit includes: (1) of each color filter for each illuminated area of the display screen; (1) legend plate blank (mylar, clear); (2) Hidden legend masks: (1) transparent (clear) face plate; (1) translucent (white) face plate; (1) display screen divided for specified style; (1) of each component common to all display screen styles; (1) of each RFI component except models T and W.

To order the kit use 40, then the selected pushbutton model code from Section 1, then the selected display style from Section 4 and then the letter K.

For example: 40 T 15 K

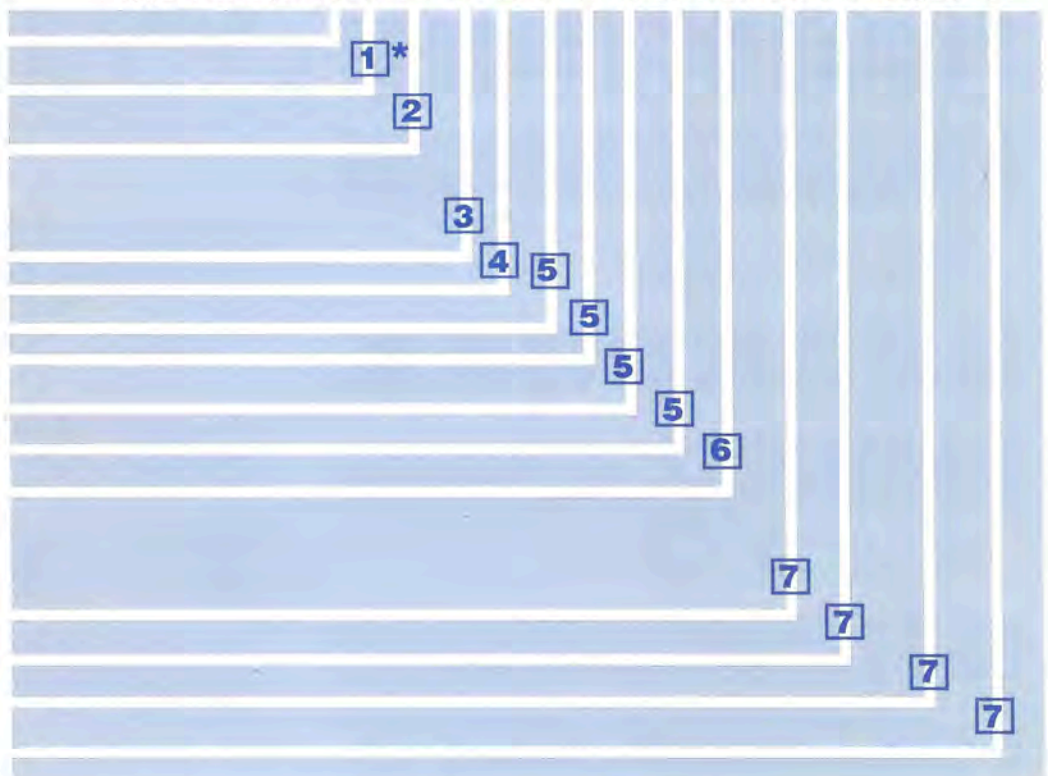
Pushbutton Lamps

Incandescent lamps are not included with the display pushbuttons and must be ordered separately.

Pushbutton Part Number Code

Typical example 40 Y 00 1 22 - G B R X 805 GO END OIL:OK X

- Model 40 and 1M Pushbutton Displays
- Pushbutton Models – T,U,W,Y AND J,L,N,P
- Pushbutton Keying –
 - 00 for no keying
 - 01 thru 60 Keying Options
- Display Types- 1 thru 8
- Display Styles – 15 thru 22
- Area Color #1= B,G,W,A,Y, or X
- Area Color #2= B,G,W,A,Y, or X
- Area Color #3= B,G,W,A,Y, or X
- Area Color #4= B,G,W,A,Y, or X
- Legend Arrangement –
 - 100-108, 200-204, 300-308,
 - 400-408, 500-516, 600-620,
 - 700-724, 800-824
- Legend Area #1 – Print Your Legend
- Legend Area #2 – Print Your Legend
- Legend Area #3 – Print Your Legend
- Legend Area #4 – Print Your Legend

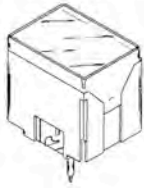


* These numbers refer to the Part Number Sections on the previous pages

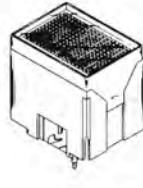
SERIES 40R PUSHBUTTON PUSHBUTTON

Display Screens - 1

Pushbutton/Display for all rectangular Switch/Indicators.



NON-RFI



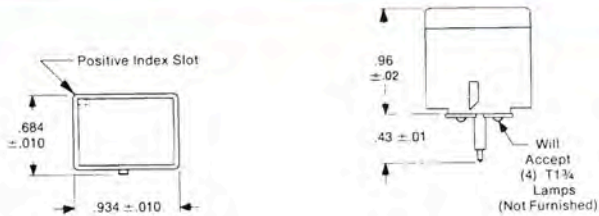
RFI



Pushbutton Model	Lamp Ground	Pushbutton Model	Lamp Ground
T	Common	U	Common
J	Split	L	Split

- 1 Not available on captive pushbutton.
- 2 RFI- shielded matrix housing or shielded individual mount unit required.

Dimensions



Legend Height -3

Code	Character Height	Description	Number of Characters
A	.100	Full Horizontal Row	11
		Half Horizontal Row	5
		Full Vertical Column	5
		Half Vertical Column	2
B	.125	Full Horizontal Row	9
		Half Horizontal Row	4
		Full Vertical Column	4
		Half Vertical Column	2
C	.187	Full Horizontal Row	6
		Half Horizontal Row	3
		Full Vertical Column	2
		Half Vertical Column	1

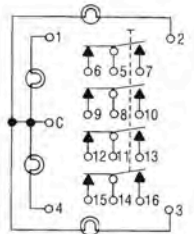
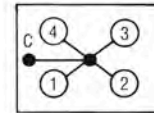
Lamp Circuit Code - 2

The Model 40R Pushbutton/Display Screen requires mating switch/indicator module, either common lamp ground or split lamp ground. Same split lamp ground switch/indicator module used for all split lamp ground pushbutton options.

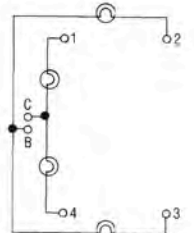
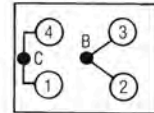
Front View Lamp Position

Schematic

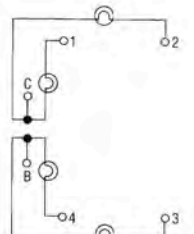
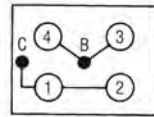
Code -1
Common lamp ground.



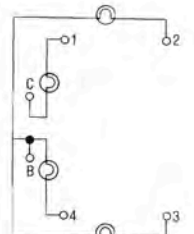
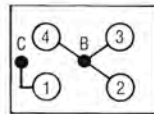
Code -2
Split lamp ground; vertical. Lamps 1 and 4 on one ground; lamps 2 and 3 on second ground.



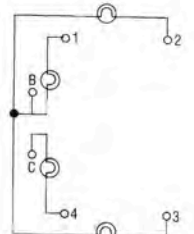
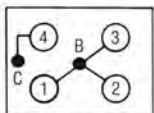
Code -3
Split lamp ground; horizontal. Lamps 1 and 2 on one ground; lamps 3 and 4 on second ground.



Code -4
Split lamp ground; horizontal. Lamp 1 on one ground; lamps 2, 3 and 4 on second ground.



Code -5
Split lamp ground. Lamps 4 on one ground; lamps 1, 2, and 3 on second ground.

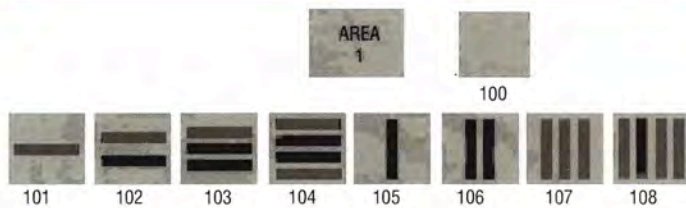


MODEL 40R PUSHBUTTON

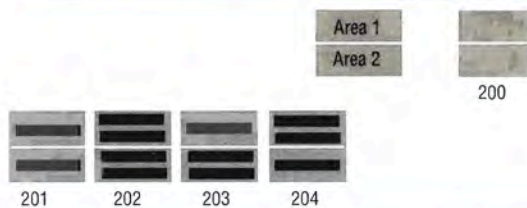
Rectangular Legend Arrangement - 4

Illustrations of legend arrangement and part numbers are shown in the following block diagrams in .100 high characters (refer to Section 3 for .125 or .187 high letter capabilities). The first block designates no legend and should be included in the part number if no legend is required. The legend areas are identified as 1,2,3 or 4.

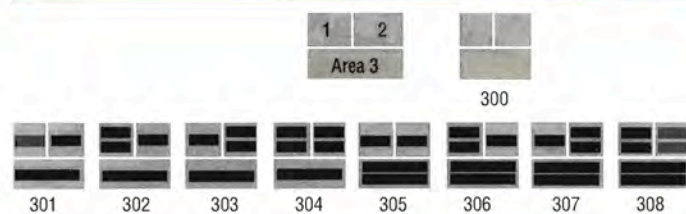
Full Display



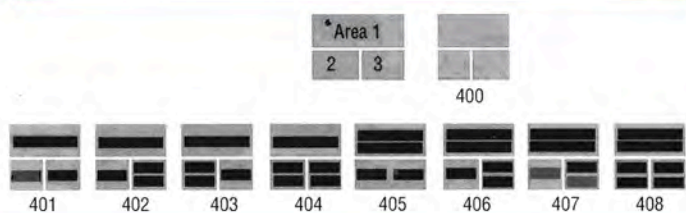
Horizontal Split



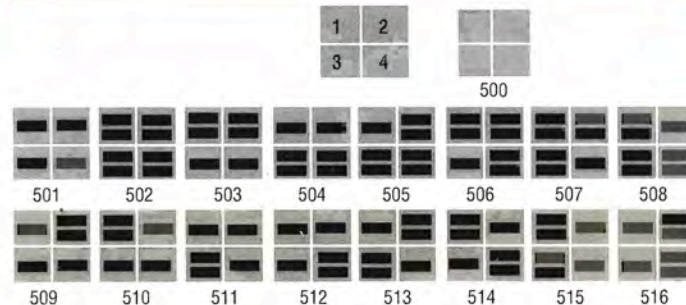
3 Way Split



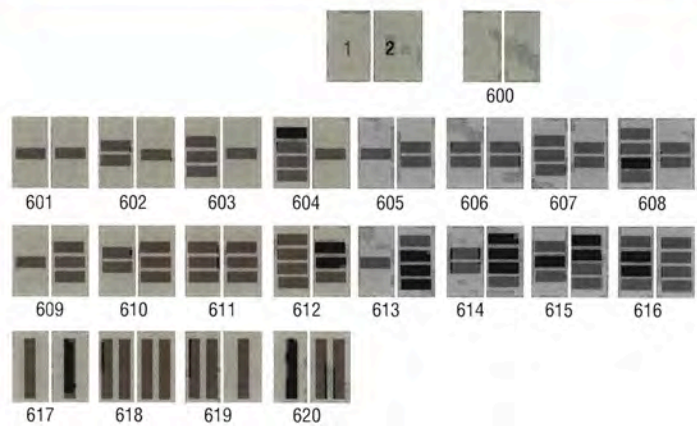
3 Way Split



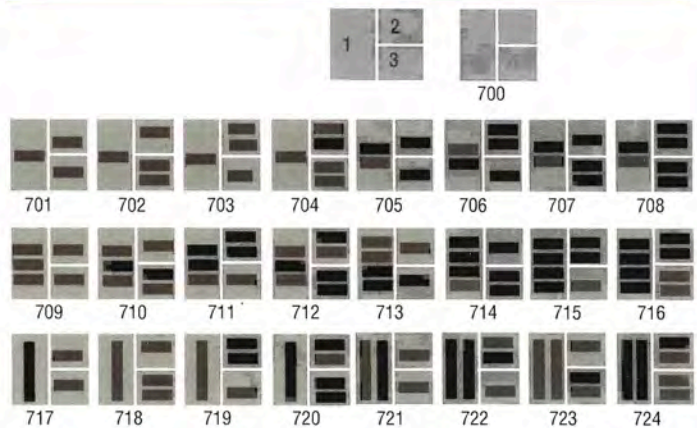
4 Way Split



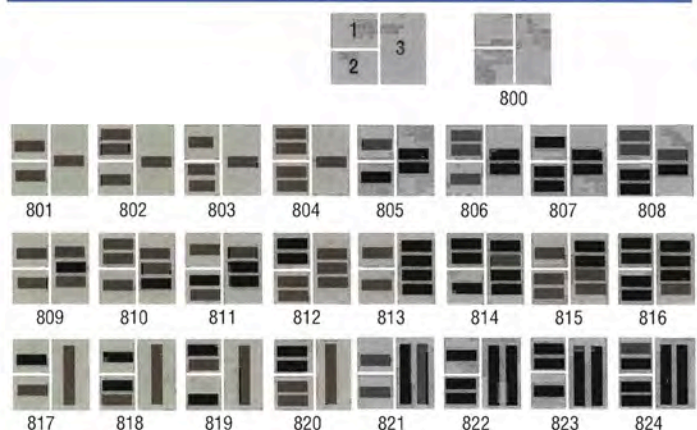
Vertical Split



Vertical Split



3 Way Split



MODEL 40R PUSHBUTTON

Area Color - 5

Area color is called out by a single letter code in the chart below. The area is defined by Section 4. The area color code portion of the Pushbutton/Display requires 4 letters. When any of these areas are not applicable, insert X in that space. Colors are in accordance with MIL-S-22885/54, red and yellow are also in accordance with MIL-C-25050.

Area Color	Blue	Green	Red	White	Amber	Yellow
Color Code	B	G	R	W	A	Y

Display Types - 6

Type descriptions

1. Black legend on translucent color background.
2. Black Legend visible only with background color illuminated. Background is white when non-illuminated.
3. Translucent color legend on black background.
4. Translucent legend visible in color against opaque background when illuminated. Background is translucent white non-illuminated with legend not visible.
5. Black legend on white translucent background. Legend engraved on external surface. Background color visible when illuminated.
6. White translucent legend on black background. Legend visible in color when illuminated.
8. Black legend on white translucent background. Background color visible only when lamps illuminated.

Lamp off	1		3		5	6	8
Lamp on	1	2	3	4	5	6	8

Legend - 7

Legend areas should be indicated by four sets of parentheses in each part number. The first set of parentheses is Area #1, the second set, Area #2, the third set, Area #3, the fourth is Area #4.

If the legend arrangement you choose does not have four legend areas or you do not want legends in all available areas, indicate so by entering an X in that set of parentheses. When you have more than one row or column of words in one area, separate them by a semi-colon. Section 4 governs the location and number code of the "areas".

Display Legend Features Available

Ref. Tech. Bulletin

Non-Glare clear face plate.	
Non Glare neutral gray face plate	124-5
Optional Legends character sizes	123-1
Two color lighting of same legend.	
Multiple display types on same pushbutton; high brightness display.	124-6
High-Contrast display.	124-7

Ordering Information

Pushbutton Part Number Code

Pushbutton Prefix: (Ordering PB w/o Switch)

40RN - T 1 A 805 G B R X 1 - (GO) (END) (OIL;OK) (X)

40RC = Captive Pushbutton

40RN = Non-Captive Pushbutton

Pushbutton Models -- T, U, J, L

Lamp Circuit Code -- 1 = Common Ground;
2, 3, 4, 5 = Split Ground

Legend Height -- A = .100, B = .125,
C = .187, X = No Legend

Legend Arrangement -- 100-108, 200-204,
300-308, 400-408, 500-516, 600-620,
700-724, 800-824

Area Color #1 = B, G, R, W, A, Y, or X

Area Color #2 = B, G, R, W, A, Y, or X

Area Color #3 = B, G, R, W, A, Y, or X

Area Color #4 = B, G, R, W, A, Y, or X

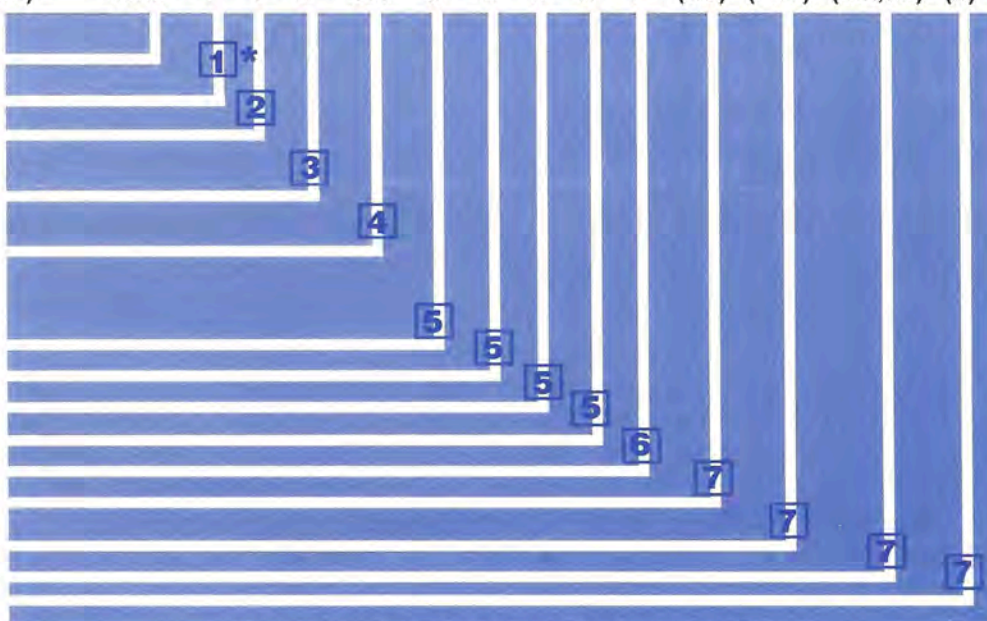
Display Type -- 1 thru 8

Legend Area #1

Legend Area #2

Legend Area #3

Legend Area #4



* These numbers refer to the Part Number Sections on the previous pages

MODEL 2

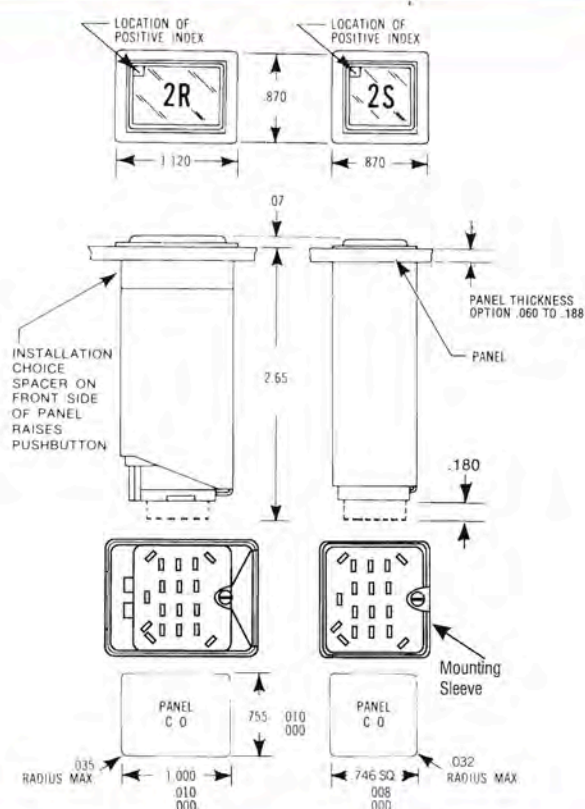
Commercial/Industrial with MIL QPL Features

Specifications

Contact Ratings	28 VDC	115 VAC 400 cps
Resistive	5.0 amp	5.0 amp
Inductive	3.0 amp	3.0 amp
Lamp	.75 amp	.75 amp
Dry Circuit	10 Microamps	

Contact Resistance	.025 ohms max.
Dielectric	1000 Vrms
Insulation Resistance	1000 megohms min
Life	100,000 cycles
Lamps	T-1 3/4 (28 V, 14 V, 6 V)

Dimensions



Using the same switch components as the Model 40, the Model 2S, square and 2R rectangular offers comparable design advantages and features. Choose indicator only or momentary or alternate action with 2PDT or 4PDT contact arrangement for control of up to eight circuits by one switch. Heavy duty contacts assure long, dependable service life.

ATTRACTIVE LEGEND DISPLAYS

Display versatility of one to four message areas on one pushbutton, as well as choice of legend style, color, and size enables the Model 2 to fill most display requirements. Clean, sharp photographic legends provide easy reading and quick identification. Lamp circuit available with common ground or split grounds for use with two power sources. Pushbuttons are relamped from front of panel without use of tools.

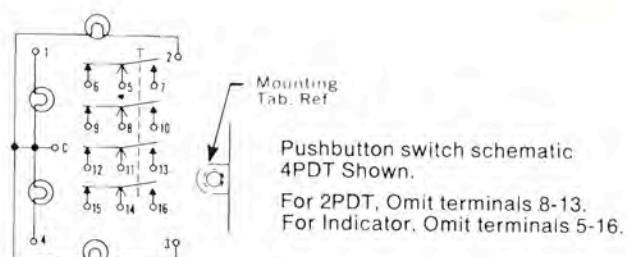
EASY INSTALLATION

Inserted in panel opening, the unit is firmly held in place by its mounting sleeve and retaining screw. Single plane wiring provides open access to both lamp and switch terminals.

TERMINATION OPTIONS

Models 2S/2R are normally supplied with solder holes in terminals. When using the Model 2S/2R with Part Number 15066-XX as a plug-on prewired termination receptacle, order switch with solid blade terminations. When installing the Model 2S/2R with plug-on receptacle the wiring bundle must be supported so not to impose a strain on the termination receptacle. See accessories for ordering information.

Schematic



Lamp Circuit Options

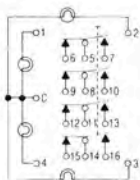
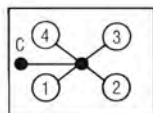
Common lamp ground and split lamp grounds are available on the Model 2S and 2R Switch/indicator. Options "C" and "D" shown below, are available on both the 2S and 2R. Options "E", "F", and "G" are available on 2R only. For horizontal 2-way split on the Model 2S see method of installing the switch/indicator, Split Lamp Ground in Switch Indicator Section.

**Front View
Lamp Position**

Schematic

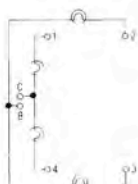
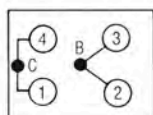
Code -C

Common lamp ground.



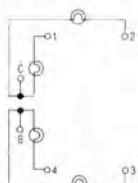
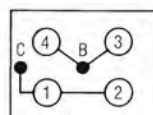
Code -D

Split lamp ground; vertical. Lamps 1 and 4 on one ground; lamps 2 and 3 on second ground.



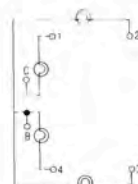
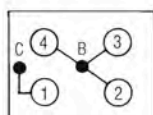
Code -E

Split lamp ground; horizontal. Lamps 1 and 2 on one ground; lamps 3 and 4 on second ground.



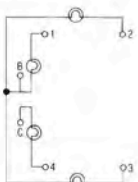
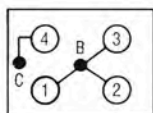
Code -F

Split lamp ground; horizontal. Lamp 1 on one ground; lamps 2, 3 and 4 on second ground.



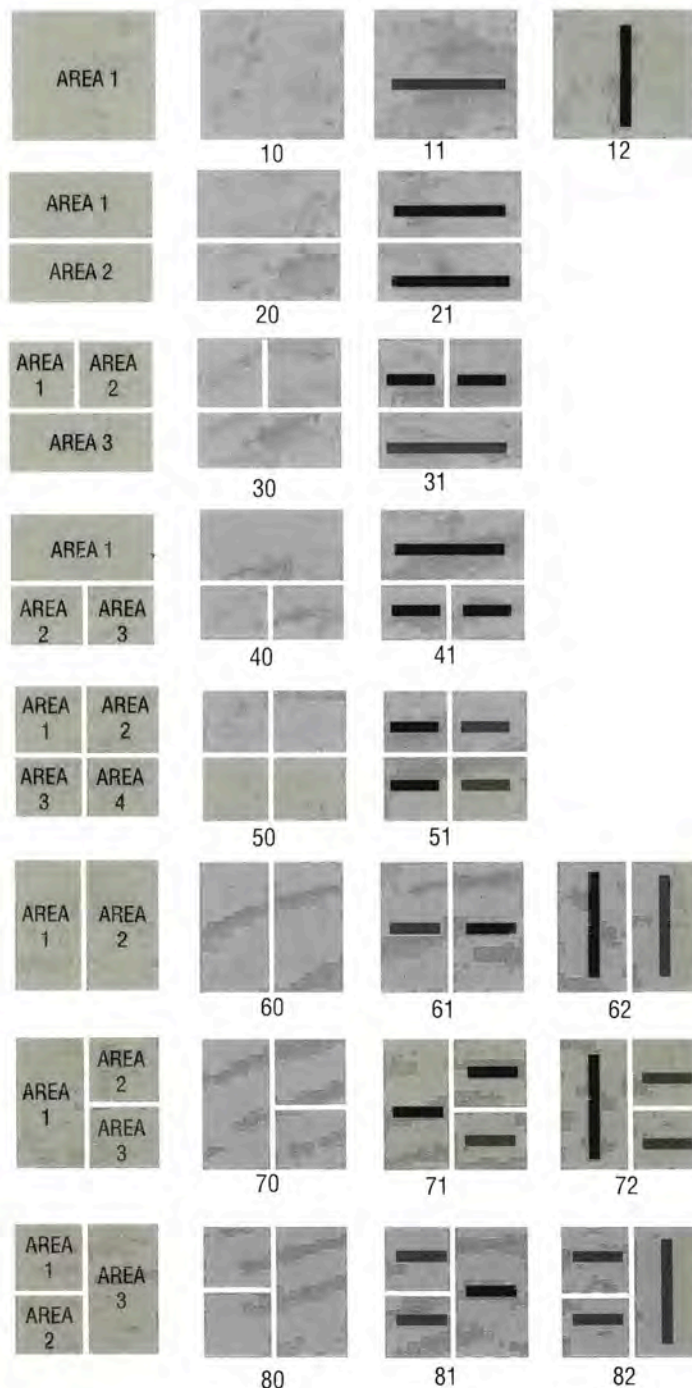
Code -G

Split lamp ground. Lamp 4 on one ground; lamps 1, 2, and 3 on second ground.



Display Styles

Pushbutton display screens are available in eight styles of screen splits, 15 through 22. Legend areas are identified as 1,2,3 or 4. Style numbers are indicated below each pushbutton.



Legend Height and Arrangements

The number of characters per display are limited according to the selection of character heights.

Code	Character Height	Description	Number of Characters	
			2R	2S
A	.100	Full Horizontal Row	11	8
		Half Horizontal Row	5	3
		Vertical Column	5	
B	.125	Full Horizontal Row	9	6
		Half Horizontal Row	4	2
		Vertical Column	4	
C	.187	Full Horizontal Row	6	3
		Half Horizontal Row	3	2
		Vertical Column	2	

Legend Display Type

Type descriptions:

1. Black legend on translucent color background.
6. White translucent legend on black background. Legend visible in color when illuminated.
8. Black legend on white translucent background. Background color visible only when lamps illuminated.

Lamp OFF

Lamp ON



Area Color

Area color is called out by a single letter code in the chart below. The area is defined by Display Styles. The area color code portion of the Pushbutton/Display requires 4 letters. When any of these areas are not applicable, insert X in that space. Colors are in accordance with MIL-S-22885/54, red and yellow are also in accordance with MIL-C-25050.

Area Color	Blue	Green	Red	White	Amber	Yellow
Color Code	B	G	R	W	A	Y

Legend

Example with legend specified:
2S4A2C21A1RGXX(OFF)(ON)(X)(X)

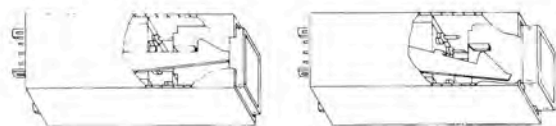
The legend portion is the last step in order to have a complete pushbutton switch part number.

If the style you choose does not have four legend areas or you do not want legends in all of the available areas of that style, indicate so by entering an X in that set of parentheses. The area you want your legend in should be coordinated with display style selected.

The first set of parentheses is Area 1, the second-Area 2; The third area-3 and the fourth-Area 4.

Installation

StacoSwitch exclusive lever latch does not rely on friction hold, but has a positive cam-lock to keep the pushbutton in position under normal operation or vibration and shock extremes. When the lever latch is disengaged by side motion, the pushbutton will spring release to allow pushbutton removal.



1. Mounting the Model 2 is as easy as 1-2-3. Insert the switch through the panel opening cutout.



2. Slip the mounting bracket over the rear of the switch.

3. Install the retaining screw and cinch up tight with a screwdriver. This sandwiches the panel between the flange and the mounting bracket.



With the pushbutton removed the lamps may easily be replaced without the use of tools.



All terminals are brought out on the same header area to provide free access to both lamp and switch terminals.

MODEL 2 - ORDERING INFORMATION

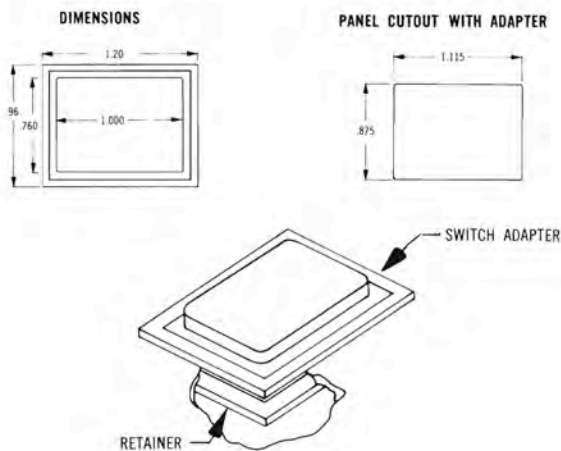
TYPICAL PART NUMBER –	2	S	4	A	2	C	21	A	1	R	G	X	X	(OFF)	(ON)	(X)	(X)
Model 2 Lighted Pushbutton Switches																	
Pushbutton Model																	
R = Rectangular																	
S = Square																	
Switch Circuit																	
0 = Indicator Only - Slotted Terminals																	
1 = Indicator Only - Solid Terminals																	
2 = 2PDT — Slotted Terminals																	
3 = 2PDT — Solid Terminals																	
4 = 4PDT — Slotted Terminals																	
5 = 4PDT — Solid Terminals																	
(Options 1, 3 and 5 for use with plug-on termination receptacle, Part #15066-XX.)																	
Switch Action																	
A = Momentary																	
B = Alt Action																	
I = Indicator																	
Switch Bezel Color																	
1 = Black Bezel																	
2 = Clear Bezel																	
Lamp Circuit																	
C = Common Lamp Ground																	
D,E,F, or G = Split Lamp Grounds																	
Display Style: 10 thru 81																	
Legend Height: A = .100, B = .125, C = .187																	
Display Type: 1, 6 or 8																	
Color Area 1																	
Color Area 2																	
Color Area 3																	
Color Area 4																	
Legend Area 1																	
Legend Area 2																	
Legend Area 3																	
Legend Area 4																	

ACCESSORIES

Panel Adaptors

- Panel adapter to retrofit openings for existing M22885/9 switches
- Retrofits Korry 300/380, Master Specialties 10H/10E and Unimax 9
- Specify part number 15053-X, where X is below:

	COLOR		
	White	Black	Grey
X	4	7	8



Barrier Frames



- For use with Models 40/40R and Models 2S/2R Switch/Indicators
- Provides vertical or horizontal separation between pushbuttons
- Prevents accidental simultaneous actuation of adjacent switches
- For individual mounting use double-end barrier
- For slot mount use one double-end and multiple single-end barriers
- Order square barriers as 15021-XX, rectangular as 15051-XX where XX is below:

XX	Barrier	Color	
		Black	White
	Single-End	11	31
	Double-End	12	32

Dummy Lamp

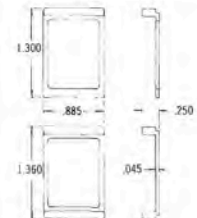
- Substitute for a T-1-3/4 flanged base lamp in Pushbutton
- Must be installed to maintain uniform actuation force when all lamps not installed
- Specify Part Number 15001



SQUARE BARRIERS



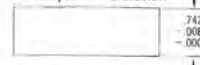
RECTANGULAR BARRIERS



SQ. SLOT MOUNTING CUTOUT

Cutout formula = .742 + (N-1)
"N" equals number of stations.

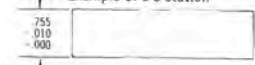
Example of a 3-station



RECT. SLOT MOUNTING CUTOUT

Cutout formula = 1.000 + ("N"-1) x 1.250
"N" equals number of stations.

Example of a 3-station



ACCESSORIES

Termination Receptacles Model 1M/1MR/49 Housing



- Receptacles mate with Model 1M/1MR/49 Housings
- Normally supplied with housing, but can be ordered separately
- Full description, layout and dimensions provided in catalog
- Specify Part Number 15066-XY where X and Y are below:

	Lamp ground	Indicator	2PDT	4PDT
X	Common	6	2	1
	Split Lamp	3	5	4

*Use for Magnetically Held Switch

	Solder	Wirewrap		PC
Y		.40 Length	.73 Length	.125 Length
	S	L	W	P

Termination Receptacles Model 101M/101MR/491



- Receptacles mate with Model 101M/101MR/491 Housings
- Normally supplied with housing, but can be ordered separately
- Full description, layout and dimensions provided in catalog
- Specify Part Number 15073-XX where XX is below:

	Lamp Ground	Indicator	2PDT	4PDT
XX	Common	01	02	03
	Split	04	05	06

Insulator Plugs

- Close off unused terminal openings in termination receptacles For Model 101M/101MR Matrix
- Specify StacoSwitch Part Number 15177 for MS27488-A20



Matrix Plugs

Model 1M and 101M Matrix Housing plugs are designed for insertion in unused matrix channel openings intended for future expansion of the system. Order your matrix housing now to accommodate planned expansion and add switch/indicator modules and pushbuttons as needed. Plugs close off matrix openings until switches are added.

Plastic matrix plug closes off front to back openings of unused matrix stations. Plug fits securely in matrix opening yet can be easily removed. Recessed grooves on two sides provide fingertip gripping for easy removal. Lip extension on all four sides position plug extension and provide tight closure of matrix opening. Specify part number 15063 -X where X is below.

	Color		
X	Black	Grey	White
	1	2	3

Crimping Tool And Positioner

- Attaches male crimp pins to wire for Model 101M/101MR Matrix
- Both Crimping Tool and Turret are required
- Specify Part Number 15179 for M22520/1-01 Crimping tool
- Specify Part Number 15180 for M22520/1-02 Turret



Male Crimp Pins

- Use for connection to #20, #22 or #24 wire with Model 101M/101MR
- Specify Part Number 15176 for M39029/1-101 Male Crimp Pins



Insertion And Removal Tool

- Inserts or removes connector wire with crimp pins attached
- Specify Part Number 15178 for M81969/14-02



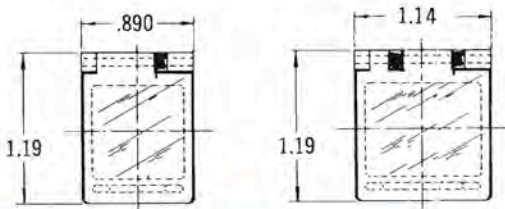
ACCESSORIES

Pushbutton Guard

- Lift to allow switch actuation
- Prevents accidental actuation
- Pushbutton guard is transparent and spring loaded
- Slips over switch housing upon installation



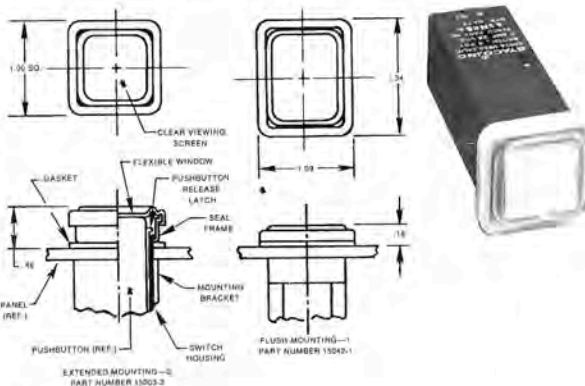
Part Number	Fits
15007	Models 45 and 47, Model 2S Switches
15070	Models 46 and 48 Switches
15055	Models 40R and 2R Switches



Splash Seals

- Prevents liquid penetration through switch panel opening
- Meets MIL-S-22885 drip proof requirements
- Meets MIL-E-5272 Procedure 1, sunshine test
- Clear silicone rubber seal flexible from -46°C to +71°C
- May be removed and reinstalled without tools for relamping

Recommended mounting centers are 1.050 min.



Part Number	Fits
15003-1	Model 43 Indicator; Model 45 Switch
15003-2	Model 44 Indicator; Model 46 Switch
15042-1 or -2	Model 40R and Series 2R Switch/Indicator

Lamps

T-1-3/4 midget flange based incandescent lamps, available in various voltages, fit all StacoSwitch units listed in this catalog. Lamps are not included with switch/indicators and must be ordered separately. See chart below for part numbers. Part numbers referenced with an asterisk (*) are stocked by StacoSwitch. All are available from local distributors.

PART NUMBER	MILITARY PART NUMBER	DESIGN VOLTS	DESIGN AMPS	MSCP	RALL
331		1.35	.06	.01	5,000
338	25237-338	2.7	.06	.04	6,000
782		5	.06	.03	30,000
345		6	.04	.04	10,000
328*	25237-328	6	.20	.34	1,000
380		6.3	.04	.03	20,000
377		6.3	.075	.23	1,000
350		6.3	.15	.45	3,000
349		6.3	.20	.55	20,000
381		6.3	.20	.40	20,000
344		10	.013-.015	.006	50,000
367X		10	.04	.08	5,000
394		12	.04	.10	10,000
330*	25237-330	14	.08	.50	2,500
382		14	.08	.30	4,000
370		18	.04	.15	10,000
459		22	.038-.042	.30	5,000
327*	25237-327	28	.04	.34	4,000
387*	25237-387	28	.04	.30	7,000

MSCP=Mean Spherical Candle Power

RALL=Rated Average Lab. Life

OTHER STACOSWITCH PRODUCTS

Single Lamp Switch/Indicators

Series 60

- M22885/18; M22885/19; and M22885/99 QPL
- 2 circuit 2PDT; 2A resistive, 1.5 A inductive, 28 VDC/115 VAC
- Momentary or Alternate switch action or Indicator
- Pushbutton display lens has seven display types in six colors
- Request Catalog GC-6/4



Series C8/C8P

- Commercial equivalent to above Model 60
- 2 circuit 2PDT; 3A resistive, 28 VDC/115 VAC
- Momentary or Alternate switch action or Indicator
- Pushbutton display lens has seven display types in six colors
- Model C8 has bezel mount, C8P has snap dress bezel mount
- Request Catalog GC-6/4



Series 70

- Miniature equivalent to above Model 60 for reduced panel space
- Meets or exceeds all applicable specifications of M22885
- Panel Seal Option meets dripproof splash-proof requirements
- Momentary or Alternate switch action is DPDT
- Request StacoSwitch Catalog GC-6/4



Unlighted Switches

Series 30

- M8805/99 QPL listed pushbutton switch
- 2-circuit 2PDT; 3A resistive, 1.5 A inductive, 28 VDC/115 VAC
- Momentary or Alternate switch action
- Pushbutton in either red or black with black dress ring
- Panel seal dress ring, makes switch panel opening moisture tight.
- Request StacoSwitch Catalog GC-6/4



Series 80 Sunlight Readable Display Switches

- Lighted legend is clearly legible even in 10,000 footcandle light
- Uniform lighting, no hot spots even when dimmed for night viewing
- Dead front hidden legend, avoids false energized appearance
- Individual or Matrix mount, 4PDT or 2PDT, 28 VDC/115 VAC
- Momentary, Alternate, Solenoid Held and Indicator
- Request StacoSwitch Catalog GC-6/6



Series 50 Dripproof Display Switches

- For applications exposed to rain, open deck spray, or condensation
- Meets or exceeds MIL-STD-108E of MIL-S-22885
- Captive rubber pushbutton seal closes moisture paths into switch
- Legend area is not covered by seal so lighted message remains bright and clear
- Request StacoSwitch Catalog GC-6/7



Series 90 SLR/NVG Display Switches

- Compact, lightweight, moisture resistant
- Meets or exceeds MIL -22885/101B and MIL-S-22885/111
- Sunlight Readable/NVG compatible
- Integral 100,000 hour LED or incandescent
- Individual or matrix mount
- Momentary, alternate and indicator
- Request StacoSwitch Catalog GC-6/8



stacosystems

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