

CATALOG **51** ISSUE C **MICRO SWITCH**

MANUAL SWITCHES

LIGHTED PUSHBUTTON
SWITCHES



MINIATURE LIGHTED
PUSHBUTTON SWITCHES



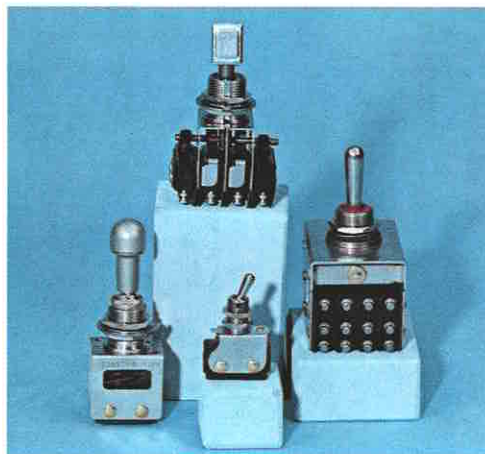
COMPACT PUSHBUTTON
SWITCHES

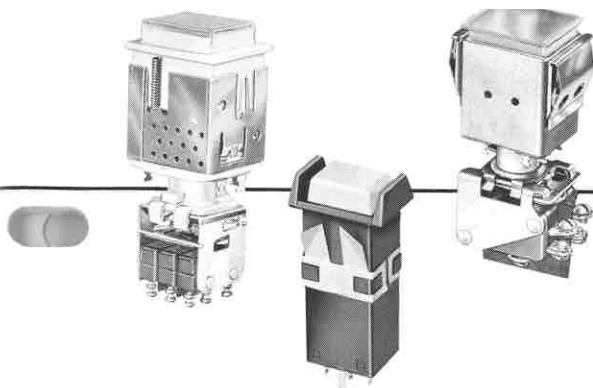


TOGGLE SWITCHES



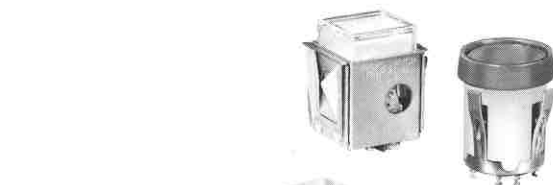
TOGGLE SWITCH ASSEMBLIES





SERIES 2 SERIES 2W SERIES 2N
LIGHTED PUSHBUTTON SWITCHES
 Individual and strip snap-in mount, up to four lamps.

a



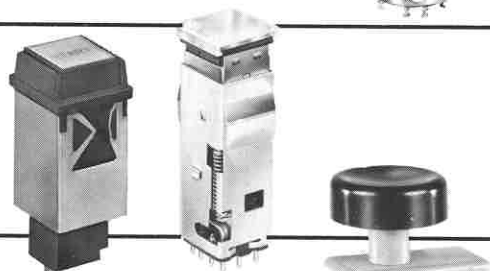
SERIES 4
LIGHTED PUSHBUTTON SWITCHES
 Individual and strip snap-in mount, one lamp.

b



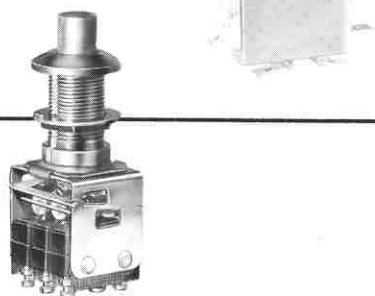
SERIES 2M SERIES 50PB SERIES 302PB
LIGHTED PUSHBUTTON SWITCHES
 Individual snap-in mount Series 2M, up to four lamps; bushing mount 50PB, one lamp; individual or strip mount 302PB, two lamps.

c



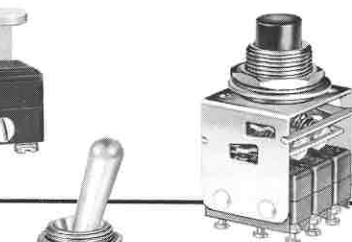
SERIES DS SERIES 3 SERIES KB
LIGHTED PUSHBUTTON SWITCHES
 Individual and strip snap-in mount or attachment to mounting rail hardware for strip or matrix arrays. Series 3, up to two lamps; DS and KB, up to four lamps.

d



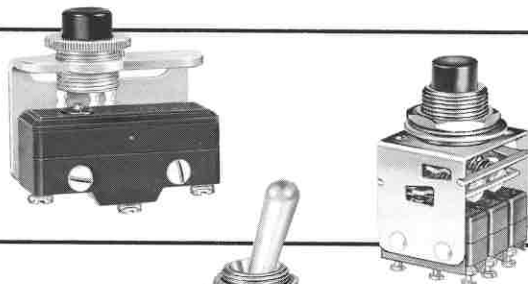
SERIES DM
NON-LIGHTED PUSHBUTTON SWITCHES
 Individual and strip snap-in mount.

e



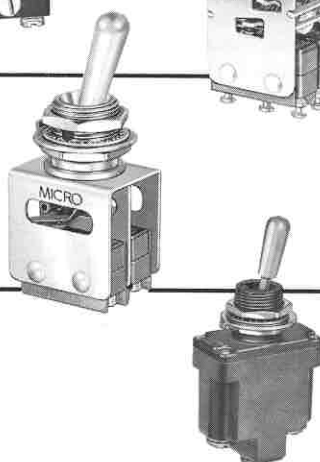
SERIES 6
NON-LIGHTED PUSHBUTTON SWITCHES
 Bushing mount, optional panel seal.

f



SERIES 12MA SERIES PB
NON-LIGHTED PUSHBUTTON SWITCHES
 Bushing mount.

g



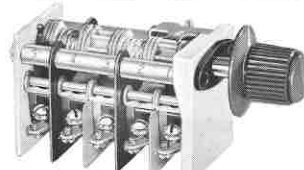
SERIES AT
TOGGLE SWITCH ASSEMBLIES

h



SERIES TL SERIES TS SERIES TW SERIES ET
TOGGLE SWITCHES
SERIES TP ROCKER BUTTON SWITCHES

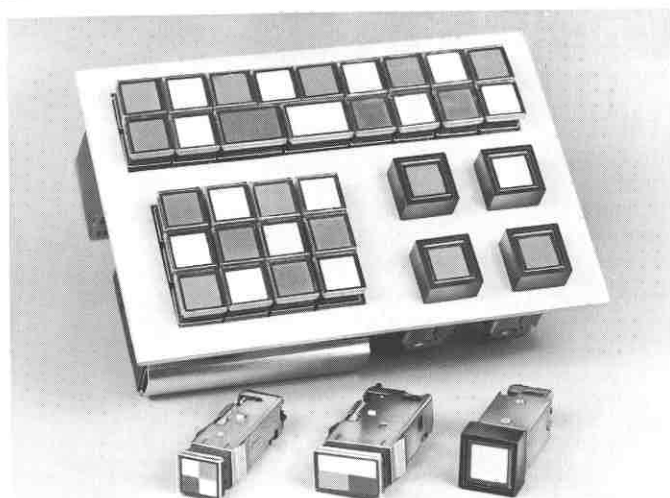
i



SERIES RM SERIES AS
ROTARY SELECTOR SWITCHES

j

SERIES DS MINIATURE DISPLAY SWITCHES



Designed to meet the requirements of MIL-S-22885, the "DS" Series of miniature lighted display switches have exceptional RFI attenuation and rugged metal construction. Available in momentary and alternate action types, they provide outstanding control flexibility and display versatility; are highly adaptable to many military and commercial applications.

- RFI ATTENUATION — RUGGED METAL SWITCH HOUSING
- DESIGNED TO MEET MIL-S-22885 REQUIREMENTS
- LONG LIFE LAMPS — REPLACEABLE FROM PANEL FRONT
- PROJECTED AND TRANSMITTED COLOR
- RELIABLE ISX — 7 AMP BASIC SWITCH
- MATRIX MOUNTING AND INDIVIDUAL MOUNTING
- PLUG-IN AND SOLDER TERMINAL OPTIONS

There are two design options: (1) custom matrix configurations featuring plug-in switches which can be replaced from the panel front without special tools and are easily fitted into a pre-assembled box girder mounting system; (2) individual mount switches, used primarily for remote stations or indicating functions. Terminals are turret solder type. A snap-on bezel acts as a guard to reduce the possibility of accidental actuation of the pushbutton.

SPECIFICATIONS

CONFIGURATION

Switch and indicators—1-unit ($3/4"$ x $3/4"$) and 1-1/2-unit ($3/4"$ x $1-1/8"$) Switch stroke is .250". Indicators are the same configuration as switches, except the button has high-free position force.

Matrix—any size and shape, depending on types and number of switches used. A single row will hold up to sixteen 1-unit switches or up to ten 1-1/2-unit switches.

Individual Mount—1-unit size.

CIRCUITRY

One or two SPDT basic switches with momentary and 2-level alternate action.

ELECTRICAL RATING (amps)

BASIC SWITCHES Silver Contacts			BASIC SWITCHES Gold Contacts		
	SEA LEVEL	50,000 FT	SEA LEVEL	50,000 FT	
28 vac:					
Inductive	4	2.5	0.5	0.5	
Resistive	7	4	1	1	
115 vac, 60 hz:					
Inductive	7	—	1	—	
Resistive	7	—	1.5	—	

TERMINATION

Matrix mounted DS devices (DSA, DSM) incorporate a front-of-panel replacement feature for both switches and lamps. Plug-in of switches and their removal can be accomplished without disturbing the wiring hardware.

The individual mount version (DSH, DSJ) allows termination directly to the switch base.

Terminals for both devices are capable of accepting up to two No. 20 gauge wires.

Lamp replacement is done from front-of-panel without tools.

INDIVIDUAL MOUNT	Page
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MATRIX MOUNT	
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Buttons (DSB)	39
Mounting Hardware (DSM)	40

SERIES DS MINIATURE DISPLAY SWITCHES

PERFORMANCE CAPABILITIES

The DS device has been designed using MIL-S-22885 as a performance standard. The following areas which have been tested are minimum levels of performance applicable to all DS listings. In many cases these levels have been exceeded by MICRO SWITCH evaluation testing.

Electrical Endurance—Assemblies subjected to a minimum of 25,000 make and break cycles under applicable loading conditions.

Dielectric Withstanding Voltage—1,000 volts RMS.

Insulation Resistance—1,000 megohms minimum prior to and 100 megohms minimum after moisture test.

Salt Fog Resistance—Device exposed to 5 percent solution for 96 hours.

Sand and Dust—Switch front exposed to sand dust per MIL-STD-810A at +25°C and +71°C for two hours each.

Thermal Shock—Device exposed to -55°C and +85°C for ½ hour each, alternately for 5 hours.

Moisture Resistance—In accordance with Method 106 MIL-STD-202 for 10 days with 100 megohms minimum after insulation resistance.

Mechanical Endurance—A minimum of 5,000 cycles at -65°C; 10,000 cycles at +55°C, and 100,000 cycles at room temperature.

Vibration—Individual mount and up to and including 2 x 8 matrix—10G's—10-500 cps, up to and including a 4 x 5 matrix—3G's—10-500 cps.

Shock—per MIL-STD-202 Method 213 at 50G half sine wave test.

RFI—DSH and DSJ switches were individually tested in accordance with the general procedure of MIL-STD-285 as specified by MIL-S-22885/71. Results were:

Frequency	Specification Requirements	Minimum Attenuation Achieved
15 KHZ	60 db	80+ db
150 KHZ	60 db	118+ db
500 KHZ	60 db	117+ db
1 MHZ	60 db	116+ db
10 MHZ	60 db	108+ db
100 MHZ	47 db	102 db
400 MHZ	39 db	85 db
1.0 GHZ	33 db	70 db
2.5 GHZ	28 db	68 db
10 GHZ	20 db	43 db

*For further test data on technical information related to your specific application, please contact your nearest MICRO SWITCH Branch Office.

BUTTONS

Buttons are comprised of cap, legend plate, diffuser plate and housing.

DISPLAY CAPABILITY

Series "DS" switches offer a wide selection of display options:

(1) An almost unlimited number of display possibilities can be achieved with 1, 2, 3, or 4-section screens, up to 4-lamp illumination, and a choice of transmitted or projected color.

(2) Film and hot stamp legending.

(3) Transmitted and projected colors.

(4) 1 and 1½-unit display sizes.

DISPLAY COLOR OPTIONS

Transmitted color refers to the use of clear lamps and colored buttons in applications which require the color to be distinguished when the display is unlighted. Projected color is a technique that uses white buttons and colored filters over the clear lamps. When the lamps are lighted, the white translucent button takes on the color projected by the filters. Colors (projected and transmitted) are: red, green, blue, yellow and white.

LAMP DATA

Each switch, either 1 or 1½-unit size, can use up to four MS24515 long-life lamps within the button housing. They retain the same brightness at any button level. Lamps are easily installed or removed from the panel front without special tools. The 5-volt, .115 amp lamps (Type 718) have a 40,000 hour life expectancy, while 28-volt .024 amp lamps (Type 6839) have 16,000 hours. They have a common ground to simplify wiring.

LEGENDING

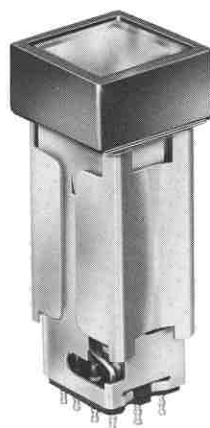
The legend film strip is located between the button cap and diffuser plate. Re-legending of buttons is accomplished by removing the old film strip and replacing with the new one. MICRO SWITCH will provide hot stamp legend service in 7/64", 9/64", and 13/64" character height on the legend film strip.

SERIES DS MINIATURE DISPLAY SWITCHES

DSH SWITCH/INDICATOR MODULES FOR INDIVIDUAL MOUNT (1-UNIT)

How To Order

Select one feature character from each section. **Example:** DSH-102BR is a 1-unit momentary SPDT gold contact device with circuit provision for 4 lamps. (**NOTE:** parts will be included only for features ordered. The price on this listing would be \$15.50. **Example:** A DSH-103BA will accept **only one** lamp.) A snap-on black bezel acts as a guard to reduce the possibility of accidental actuation of the pushbutton since the switch operating point is below the top surface of the bezel.



Shown with
DSB Button Installed

DSH Switch and Indicator Modules


(order buttons
from page 37)

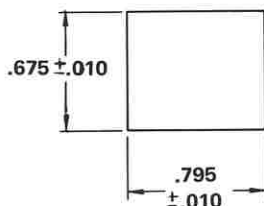
PRICING*

	LISTING	BASE PRICE
1 Unit 1 Lamp Indicator	DSH-501BA	\$9.35
If Switches Are Desired, ADD: (to Base Price)		
BASIC SWITCH	MOM. ACT.	ALT. ACT.
CODE 02—SPDT Gold Contacts	\$3.10	\$3.50
CODE 03—Two SPDT Gold Contacts	4.70	5.05
CODE 04—SPDT Silver Contacts	2.60	2.95
CODE 05—Two SPDT Silver Contacts	4.15	4.50
If Circuitry For Additional Lamps Is Desired, ADD: (to Base Price)		
	For 2 Lamps	\$1.55
	For 3 Lamps	2.60
	For 4 Lamps	3.65

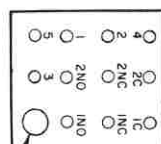
*Pricing Subject to Discount R.

Product Class 158 Minimum Schedule Quantity—5 pieces

MAIN HOUSING TYPE	BASIC SWITCH (Pole Code)	BEZEL COLOR	LAMP CIRCUIT POSITION
DSH-1—1-Unit Momentary Action DSH-2—1-Unit Alternate Action DSH-5—1-Unit Indicator	01—None—(Indicator) 02—SPDT Gold Contact Switch 03—Two SPDT Gold Contact Switches 04—SPDT Silver Contact Switch 05—Two SPDT Silver Contact Switches	B—Black	KEYING CORNER  A—1 B— 2 C— 3 D— 4 E—1,2 F— 2,3 G— 3,4 H—1, 4 J—1, 3 K— 2, 4 L—1,2,3 M— 2,3,4 N—1,2, 4 P—1, 3,4 R—1,2,3,4

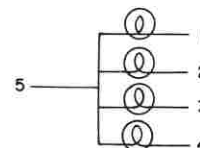


Panel Cutout



POLARIZING PIN

Switch Termination Identification
(Bottom View)



Lamp Circuitry

Mounting Dimensions for
DSH units are the same as
those of the DSJ shown on
page 33

SERIES DS MINIATURE DISPLAY SWITCHES

DSB BUTTONS FOR INDIVIDUAL MOUNT (1-UNIT) LIGHTED DSH SWITCH/INDICATORS

The DSB buttons and DSH housings for individual mount lighted pushbutton switches and indicators are ordered separately. Refer to the "How to Order" information on buttons **below**, and switch and indicator housings, **page 36**. These have the same construction as DSJ assembled devices, but offer optional features not covered in the DSJ.

The DSH type individual mount device combines rugged construction with good front of panel design appearance. The device is primarily for remote station or indicating functions. However, it can be strip mounted in a slotted panel cutout. DSH switches can be mounted on .062" to .242" thick panels. Modularity of the device allows for ordering the exact combination of desired features.

How To Order DSB Buttons

(order switch and indicator housings from page 36)

Select proper feature character for each of the six options (shown below). **Example:** DSB-12RGRG-NR2. This is a DSB 1-unit button with 2-section vertical split display. Display color is red in positions 1 and 3, green in positions 2 and 4 (transmitted). Lamp type

is 28 volt. No legending is requested. The price on this listing would be \$7.90. (If no lamps are required, omit the last two characters in the listing.)

A sectionalized explanation follows to illustrate how this listing is compiled.

Button	Construction	Color	Legending	Lamp Position & No. of Lamps.	Lamp Type
DSB-1	2	RGRG	-N	R	2
(1-unit)	(2-section vertical display)	(transmitted red and green)	(none)	(4 lamps required positions 1,2,3,4)	(28 volt)



1-UNIT

	PRICING*	LIST PRICE
1-unit DSB Buttons (Without Lamps)	Single Section 2-Section 3-Section 4-Section	\$2.00 2.50 3.00 3.50
Lamps	5 Volt (1 MS Type) 28 Volt (2 MS Type)	.80 each 1.35 each
Legends**	Per Button	.50
Projected Color	Per Filter	.15

*Pricing Subject to Discount R. **See Legend Sheet.
Product Class 159. Minimum Schedule Quantity—5 pieces

BUTTON	CONSTRUCTION	COLOR	LEGENDING	LAMP POSITION & NO. OF LAMPS.	LAMP TYPE
		Keying Corner		Keying Corner	
DSB-1 (1-unit size)	1-Single Section Display Display 2-2-Section Vertical Split Display 3-2-Section Horizontal Split Display 4-3-Section Display (1/2 Section at Top) 5-3-Section Display (1/2 Section at Bottom) 6-3-Section Display (1/2 Section at Left) 7-3-Section Display (1/2 Section at Right) 8-4-Section Display	R-Red T B-Blue T Y-Yellow T G-Green T W-White T A-Red P C-Blue P D-Yellow P E-Green P H-White P T-Transmitted P-Projected Note: Select One Color for Each Quadrant.	L-Button Legended* N-No Legend *See Legend Sheet	A-1 B-2 C-3 D-4 E-1,2 F-2,3 G-3,4 H-1, J-1,3 K-2,4 L-1,2,3 M-2,3,4 N-1,2,4 P-1,3,4 R-1,2,3,4	1-5Volt MS Type 2-28Volt MS Type

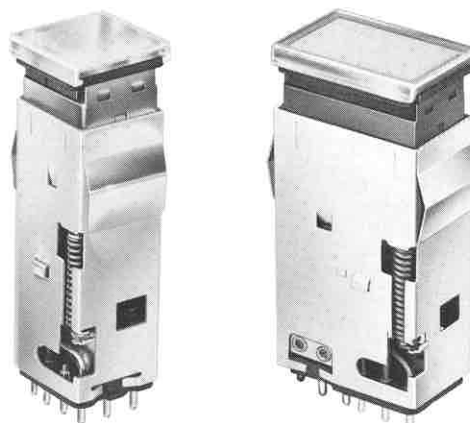
SERIES DS MINIATURE DISPLAY SWITCHES

DSA SWITCH/INDICATOR MODULES FOR PLUG-IN STRIP AND MATRIX MOUNT (1 and 1-1/2 UNIT)

Matrix mounted DSA switches and indicators plug into connector blocks mounted in a rigid pre-assembled mounting system. They can be replaced from the panel front without disturbing the wiring hardware. No special tools are necessary.

Housings are available in 1-unit and 1½-unit sizes. Switches and/or indicators can be mounted in rows of up to sixteen 1-unit or up to ten 1½-unit sizes. Individual rows can be strip mounted or locked together to form a matrix.

Order mounting hardware from page 40.



Shown with DSB Button Installed

How To Order

Select desired features using the correct character for each of the three areas. **Example:** for a 1½-unit alternate action DSA (having two SPDT gold contact switches) with four lamp circuitry positions, write on your order DSA-403AR. **NOTE**—a DSA-403AA, however, accepts **only one lamp**.

The wiring connector block is furnished as part of the DSA switch. It will have the appropriate number of terminals for the desired function.



Connector Block

The following sectionalized explanation illustrates how the DSA-403AR (example given above) is compiled. List price for this example would be \$20.85.

DSA-4	03	AR
(main housing for 1½-unit alternate action)	(03 is added to show two SPDT gold contact switches)	(AR is added to indicate 4-lamp circuitry in positions 1,2,3,4)

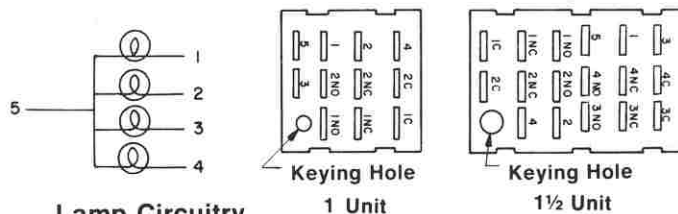
PRICING*

	BASE LISTING	BASE PRICE
1-Unit, 1 Lamp Indicator	DSA-501AA	\$11.00
1½ Unit, 1 Lamp Indicator	DSA-601AA	13.00

FOR ADDITIONAL FEATURES ADD: (To Base Price)		
	LIST PRICE	
BASIC SWITCHES		
1-Pole Silver Contacts	MOM. ACTION \$2.60	ALT. ACTION \$2.95
2-Pole Silver Contacts	4.15	4.50
1-Pole Gold Contacts	3.10	3.50
2-Pole Gold Contacts	4.70	5.05

	LIST PRICE
LAMPS	
2 Lamp Provision	\$1.55
3 Lamp Provision	2.60
4 Lamp Provision	3.65

*Pricing Subject to Discount R. Product Class 158
Minimum Schedule Quantity—5 pieces



Termination Identification Connector Block

MAIN HOUSING	BASIC SWITCH (Pole Code)	LAMP CIRCUIT POSITION
DSA-1—1 Unit Momentary Action	01—None (Indicator)	AA—1
DSA-2—1 Unit Alternate Action	02—SPDT Gold Contact Switch	AB—2
DSA-3—1½ Unit Momentary Action	03—Two SPDT Gold Contact Switches	AC—3
DSA-4—1½ Unit Alternate Action	04—SPDT Silver Contact Switch	AD—4
DSA-5—1 Unit Indicator	05—Two SPDT Silver Contact Switches	AE—1,2
DSA-6—1½ Unit Indicator		AF—2,3
		AG—3,4
		AH—1, 4
		AJ—1, 3
		AK—2, 4
		AL—1,2,3
		AM—2,3,4
		AN—1,2, 4
		AP—1, 3,4
		AR—1,2,3,4

Contact your local MICRO SWITCH office for RFI data.

SERIES DS MINIATURE DISPLAY SWITCHES

DSB BUTTONS FOR PLUG-IN MATRIX MOUNT (1 and 1-1/2 UNIT) DSA SWITCH/INDICATORS

The 1-unit ($\frac{3}{4}$ " x $\frac{3}{4}$ ") and 1½-unit ($\frac{3}{4}$ " x $1\frac{1}{8}$ ") DSB buttons and DSA housings for matrix mounted lighted pushbutton switches and indicators are ordered separately. Refer to the "How to Order" information on buttons **below**, and switch and indicator housings on page 38.

Mounting hardware for matrix mounted units is shown on page 40 along with ordering information.



1-UNIT



1-1/2 UNIT

How To Order DSB Buttons

Select proper features for each of the six options (shown below). Example: DSB-12RGRG-NR2. This is a DSB 1-unit button with 2-section vertical split display. Display color is red in positions 1 and 3, green in positions 2 and 4 (transmitted). Lamp type is 28

volt. No legending is requested. The list price for this listing would be \$7.90. (If no lamps are required, omit last two characters in the listing.) A sectionalized explanation follows to illustrate how this listing is compiled.

Button	Construction	Color	Legending	Lamp Position & No. of Lamps.	Lamp Type
DSB-1	2	RGRG	- N	R	2
(1-unit)	(2-section vertical display)	(transmitted red and green)	(none)	(4 lamps required positions 1,2,3,4)	(28 volt)

Listings for the 1½-unit DSB Buttons are derived in a similar manner—i.e., DSB-28AECH-NR2 means a 1½-unit DSB button with 4 section display in projected colors red, green, blue and white (segments 1, 2, 3, and 4 in that order) without legending and four 28 volt MS type lamps in positions 1, 2, 3, 4.

PRICING*

LIST PRICE		LIST PRICE	
1-Unit Without Lamps		1½ Unit Without Lamps	
DSB BUTTONS	Single Section \$2.00	Single Section	\$2.50
	2-Section 2.50	2-Section	3.00
	3-Section 3.00	3-Section	3.50
	4-Section 3.50	4-Section	4.00
LAMPS	5 volts (1MS Type) \$.80 each		
	28 volts (2MS Type) 1.35 each		
LEGENDS**	(per button) .50 each		
PROJECTED COLOR	(per filter) .15 each		

*Pricing Subject to Discount R. Product Class 159 Minimum Schedule Quantity—5 pieces
**See Legend Sheet. FO-62799 available from your nearest MICRO SWITCH Branch Office.

BUTTONS	CONSTRUCTION	COLOR	LEGENDING	LAMP POSITION (and number of lamps)	LAMP TYPE
		KEYING CORNER 		KEYING CORNER 	
DSB-1 (1-Unit)	1—Single Section Display	R—Red T B—Blue T Y—Yellow T	L—Button Legended*	A—1 B— 2 C— 3 D— 4	1-5Volt MS Type 2-28Volt MS Type
DSB-2 (1½ Unit)	2—2-Section Vertical Split Display	G—Green T W—White T	N—No Legend	E—1,2 F— 2,3 G— 3,4 H—1, 4 J—1, 3 K— 2, 4 L—1,2,3 M— 2,3,4 N—1,2, 4 P—1, 3,4 R—1,2,3,4	
	3—2-Section Horizontal Split Display	A—Red P C—Blue P D—Yellow P E—Green P H—White P			
	4—3-Section Display (½ Section at Top)				
	5—3-Section Display (½ Section at Bottom)				
	6—3-Section Display (½ Section at Left)	T—Transmitted P—Projected			
	7—3-Section Display (½ Section at Right)				
	8—4-Section Display				
		Note: Select One Color for Each Quadrant.	*See Legend Sheet		

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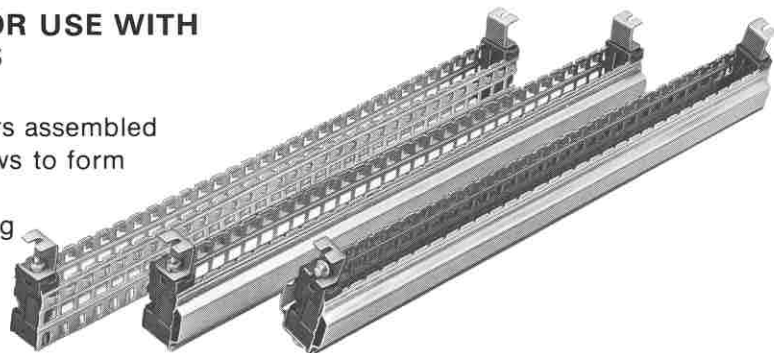
MICRO SWITCH

SERIES DS MINIATURE DISPLAY SWITCHES

MATRIX MOUNTING HARDWARE FOR USE WITH DSA LIGHTED SWITCH/INDICATORS

Mounting hardware consists of mounting bars assembled with mounting blocks on the ends of the rows to form a rigid, box girder frame.

Rows are interlocked to build the mounting matrix. Each mounting block has a U-shaped bracket attached at the top to facilitate panel installation.



Type 1 Type 2 Type 3

For Single Strip or Multiple Row Matrix

- Type 1—For inside rows of matrix
 Type 2—For outside rows of matrix (reinforced on one side)
 Type 3—For single strip mount (reinforced on both sides)

There is a provision for attaching other rows on both sides of Type 1 mounting bars and on one side of Type 2 mounting bars.

Mounting hardware for matrix mount switches and indicators (described on page 38) are ordered from the chart below.

They have provision on each side for attaching other rows.

HOW TO ORDER

Mounting Hardware Type	Catalog Listing Prefix	Row Length Suffix (½-Unit Increments)	
Type 1	DSM-1	01 — 1 Unit	17 — 9 Unit
		02 — 1½ Unit	18 — 9½ Unit
Type 2	DSM-2	03 — 2 Unit	19 — 10 Unit
		04 — 2½ Unit	20 — 10½ Unit
Type 3	DSM-3	05 — 3 Unit	21 — 11 Unit
		06 — 3½ Unit	22 — 11½ Unit
		07 — 4 Unit	23 — 12 Unit
		08 — 4½ Unit	24 — 12½ Unit
		09 — 5 Unit	25 — 13 Unit
		10 — 5½ Unit	26 — 13½ Unit
		11 — 6 Unit	27 — 14 Unit
		12 — 6½ Unit	28 — 14½ Unit
		13 — 7 Unit	29 — 15 Unit
		14 — 7½ Unit	30 — 15½ Unit
		15 — 8 Unit	31 — 16 Unit
		16 — 8½ Unit	

NOTE: When specifying the row length in the catalog listing, add the number of units occupied by the switches and/or indicators. Then convert the total to the proper suffix number bearing in mind that the total row length must be filled. **Example:** type 1 mounting hardware (DSM-1) for two 1-unit and two 1½-unit devices is derived as follows.

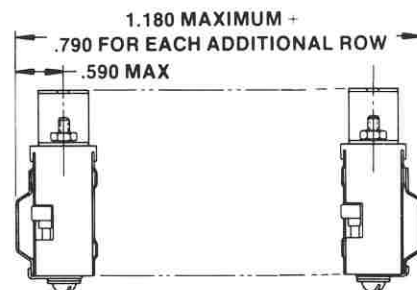
The two 1-unit devices would require two units of space. The two 1½-unit devices would take three units of space for a total of five units of space (09) for the row length. Catalog listing would be DSM-109.

PRICING*

DSM	1 — 8 Unit Rows (01-15)	9 — 16 Unit Rows (16-31)
Type 1	\$3.10	\$4.15
Type 2	4.15	5.20
Type 3	5.40	6.55

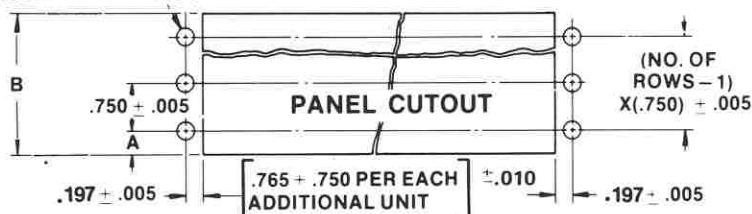
*Pricing subject to Discount R, Product Class 160

Minimum Schedule Quantity — 5 pieces



MATRIX MOUNTING

ACCEPTS NO. 4 MOUNTING SCREW



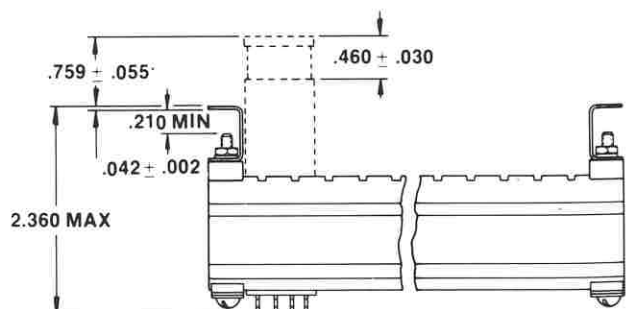
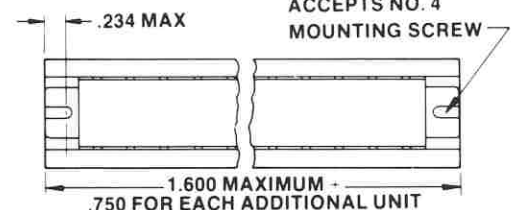
A = .352 ± .005 IF EFFECTIVE PANEL THICKNESS IS .234 OR LESS.

A = .382 ± .005 IF EFFECTIVE PANEL THICKNESS EXCEEDS .234

B = (.704 + .750 FOR EACH ADDITIONAL ROW) ± .010 IF EFFECTIVE PANEL THICKNESS IS .234 OR LESS.

B = (.765 + .750 FOR EACH ADDITIONAL ROW) ± .010 IF EFFECTIVE PANEL THICKNESS EXCEEDS .234.

ACCEPTS NO. 4 MOUNTING SCREW



SERIES DS MINIATURE DISPLAY SWITCHES

MIL-S-22885 ASSEMBLED INDIVIDUAL MOUNT LIGHTED DSJ SWITCH/INDICATORS

DSJ switches meet the requirements of MIL-S-22885 and are available in single-hole mount 1-unit size. Mounting can be on .062" to .242" thick panels. They are complete assemblies, consisting of: (1) two SPDT silver contact SX type subminiature basic switches rated at 7 amps, 250 vac; and (2) three-piece white buttons (cap, diffuser plate and housing.) Display can utilize up to four T-1 Type lamps. If projected or transmitted color, lamps, or less circuitry either in switch or lamp are needed, see DSH switches.

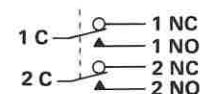
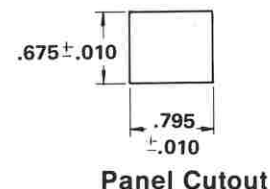
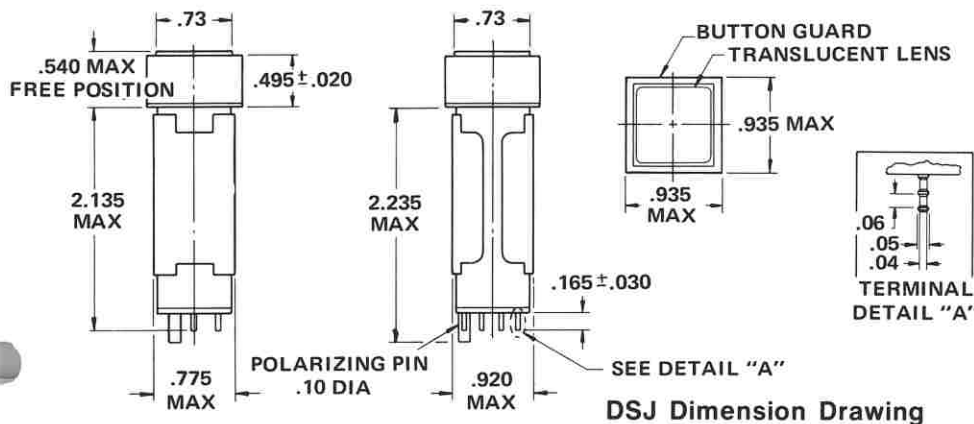
DSJ catalog listings charted below consist of a completely assembled lighted pushbutton switch or indicator. Lamps are not furnished. Select desired display and switching action or indicator only.



DSJ PRICING*

	Momentary-Action Switches Catalog Listings	LIST PRICE	Alternate-Action Switches Catalog Listings	LIST PRICE	Indicators Catalog Listings	LIST PRICE
Single Section Display	DSJ-0001 (M22885/71-01)	\$20.30	DSJ-0009 (M22885/71-09)	\$20.65	DSJ-0017 (M22885/71-17)	\$16.10
2-Section Horizontal Display	DSJ-0002 (M22885/71-02)	20.80	DSJ-0010 (M22885/71-10)	21.15	DSJ-0018 (M22885/71-18)	16.65
2-Section Vertical Display	DSJ-0003 (M22885/71-03)	20.80	DSJ-0011 (M22885/71-11)	21.15	DSJ-0019 (M22885/71-19)	16.65
4-Section Split Display	DSJ-0004 (M22885/71-04)	21.85	DSJ-0012 (M22885/71-12)	22.20	DSJ-0020 (M22885/71-20)	17.70
3-Section Display (1/2 Section at Right)	DSJ-0005 (M22885/71-05)	21.30	DSJ-0013 (M22885/71-13)	21.70	DSJ-0021 (M22885/71-21)	17.10
3-Section Display (1/2 Section at Left)	DSJ-0006 (M22885/71-06)	21.30	DSJ-0014 (M22885/71-14)	21.70	DSJ-0022 (M22885/71-22)	17.10
3-Section Display (1/2 Section at Top)	DSJ-0007 (M22885/71-07)	21.30	DSJ-0015 (M22885/71-15)	21.70	DSJ-0023 (M22885/71-23)	17.10
3-Section Display (1/2 Section at Bottom)	DSJ-0008 (M22885/71-08)	21.30	DSJ-0016 (M22885/71-16)	21.70	DSJ-0024 (M22885/71-24)	17.10

*Pricing Subject to Discount R. Product Class 158.
Minimum Schedule Quantity—5 pieces

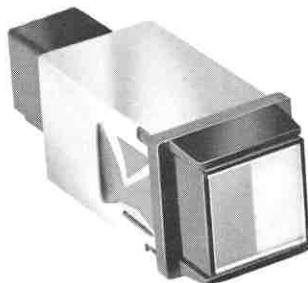
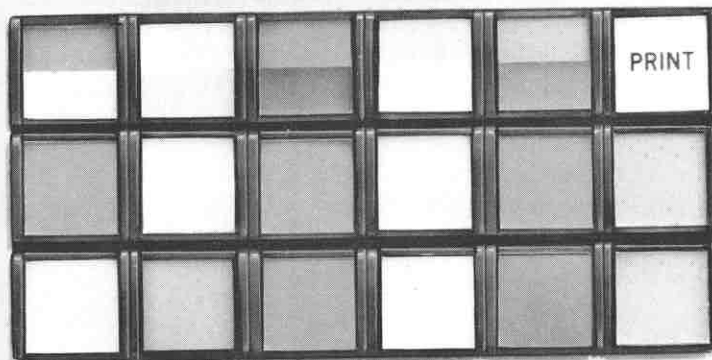


MICRO SWITCH

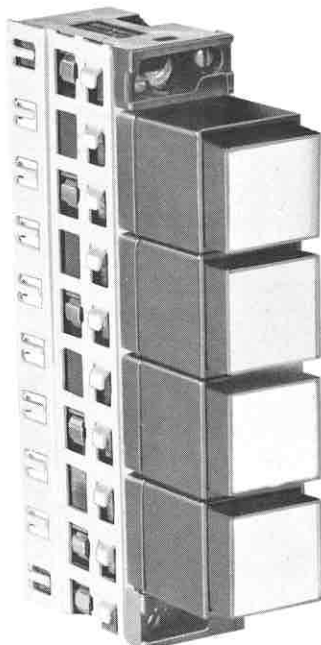
SERIES 3 LIGHTED PUSHBUTTON SWITCHES



MATRIX
MOUNTED
SWITCHES



INDIVIDUAL
MOUNT
SWITCH



SWITCHES
ASSEMBLED
IN MOUNTING
HARDWARE

- FRONT OF PANEL REPLACEMENT OF SWITCHES AND LAMPS—RELEGENDABLE BUTTONS
- SIX STANDARD LIGHTED DISPLAY COLORS AVAILABLE
- MOMENTARY OR 2-LEVEL ALTERNATE ACTION
- POWER SWITCHES OR ELECTRONIC DUTY FORM A REED SWITCHES

Series 3 has multiple options in the same size package. By standardizing on Series 3 as building blocks for your control panels, you can specify either matrix, individual, or strip mounting, momentary and two-level alternate-action, power or reed switches (with audible "click click" feedback), and matching lighted indicators.

Matrix mounted switches are provided with termination suitable for direct wiring, printed circuit board mounting or plug-in termination to customer pre-wired connector blocks. They can be replaced from the panel front by simply using a screw driver to disengage the switch mounting lugs from the mounting rails.

Individual mount switches have spring clips on two sides for front of panel snap-in mounting.

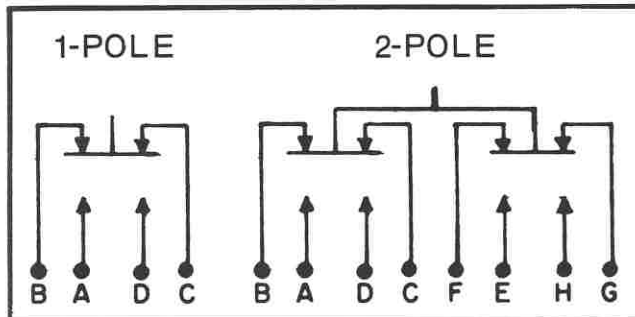
SERIES 3 LIGHTED PUSHBUTTON SWITCHES

SPECIFICATIONS

POWER SWITCHES

Contact Arrangement:

Schematic shows Form Z circuitry (Form X and Y versions available).



Electrical Rating:

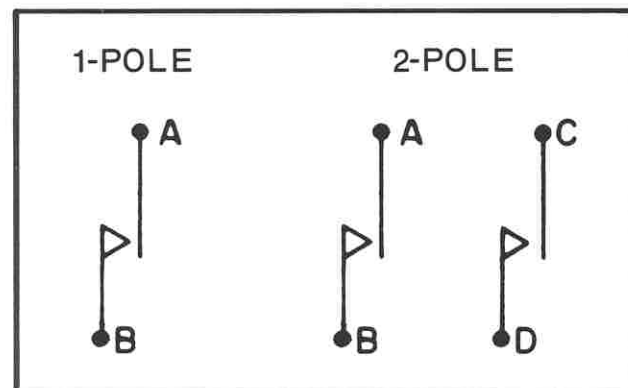
5 amp ind. or res., 115 VAC
3 amp ind., 5 amp res., 28 VDC
100,000 operations at rated load

Characteristics:

Operating force 8.0 oz. approx.
Total travel** .250 in. approx.

REED SWITCHES

Contact Arrangement:



Electrical Rating:

Alternating Current

12VA Max - Inrush or Resistive
Max. Voltage: 240VAC @ 12VA
Max. Current: 250 milliamps
@ 12VA

Direct Current

8 Watts Maximum Resistive only
Max. Voltage: 240VDC @ 8 Watts
Max. Current: 250 milliamps
@ 8 Watts

VAC 60 Cy.	Maximum Current in Milliamps	Volts DC	Maximum Current in Milliamps
0-48	250	0-32	250
120	100	120	66
240	50	240	33

Characteristics:

Operating force 3.0 oz. approx.
Total travel** .250 in. approx.

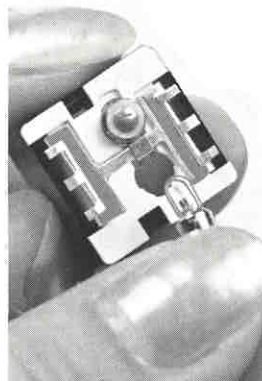
TERMINATION-SWITCHES AND INDICATORS

Direct wiring to switch*, plug-in to connector blocks, or printed circuit board termination. Available on either switch or connector.

INDICATORS

Lighted indicators are identical in size and appearance to the switches, but without provision for switching.

BUTTONS



Lamps and legends can be changed from the panel front. The button is removed by pulling it forward out of the switch housing. Lamps are retained in the button for ease of replacement.

Relegendable buttons have a transparent colorless insert which fits over a colored diffuser plate and snaps into the button's shell. Legending may be applied to the diffuser plate. The diffuser plate can be easily removed and replaced if a change of legend information is desired. To ensure proper orientation during assembly, the button is keyed to the switch housing. Lighted display is provided by one or two T-1, 5 or 28 volt lamps.

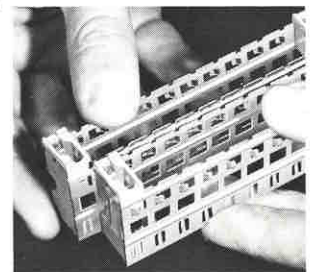
LEGENDING

MICRO SWITCH will furnish hot stamp legending in standard modified Gothic. (See Series 3 legend order sheet for type size and number of characters possible per line.)

MOUNTING

Mounting options for Series 3 switches and indicators are:

1. Individual mount units have integral clips on two sides of the housing for front of panel snap-in mounting. They can be mounted in separate cutouts or strip mounted in a single cutout.
2. Units that require Type 3M mounting hardware are mounted in a single cutout. Two or more rows can be attached together to form a matrix or a single row can be strip mounted.



UL LISTING

UL listing is available on Series 3 devices.
UL switches can *only* be used with 3N1 or 3N2 buttons.

*NOTE: Caution should be exercised when soldering to direct wire terminations to prevent overheating and flux contamination of the switch contacts.

**When alternate-action switches are operated, the button remains depressed approximately .180 in. and the circuit is maintained until the button is pushed again.

SERIES 3 LIGHTED PUSHBUTTON SWITCHES

MOUNTING HARDWARE

Mounting hardware for 3A, 3E, 3B, 3K, and 3C units is provided by a box girder structure (see 3M Type drawings below). Interlocking tabs enable them to be assembled into a multi-row matrix.

Example 3M 1 - 09

MOUNTING HARDWARE BASE LISTING	Type of Mounting Bars	ROW LENGTH*	
3M For strip or matrix mounting of 3A, 3B, and 3C modules	1 Standard Type, for use with connector blocks for plug-in wiring.	01-1 Unit 02-1½ Unit 03-2 Unit 04-2½ Unit 05-3 Unit 06-3½ Unit 07-4 Unit 08-4½ Unit 09-5 Unit 10-5½ Unit 11-6 Unit 12-6½ Unit 13-7 Unit 14-7½ Unit 15-8 Unit 16-8½ Unit	17-9 Unit 18-9½ Unit 19-10 Unit 20-10½ Unit 21-11 Unit 22-11½ Unit 23-12 Unit 24-12½ Unit 25-13 Unit 26-13½ Unit 27-14 Unit 28-14½ Unit 29-15 Unit 30-15½ Unit 31-16 Unit
	2 Narrow width type, allows direct wiring		

Each 3M Type listing consists of two mounting bars and two mounting blocks in packet form.

MOUNTING HARDWARE PRICING**

CATALOG LISTING	LIST PRICE
3M1-01 through 3M1-15	\$1.80
3M1-16 through 3M1-31	2.35
3M2-01 through 3M2-15	1.65
3M2-16 through 3M2-31	2.10

*To specify the row length in the catalog listing, add the number of switches and/or indicators, then convert the total to the proper suffix number, i.e. "09" for a 5-unit row.

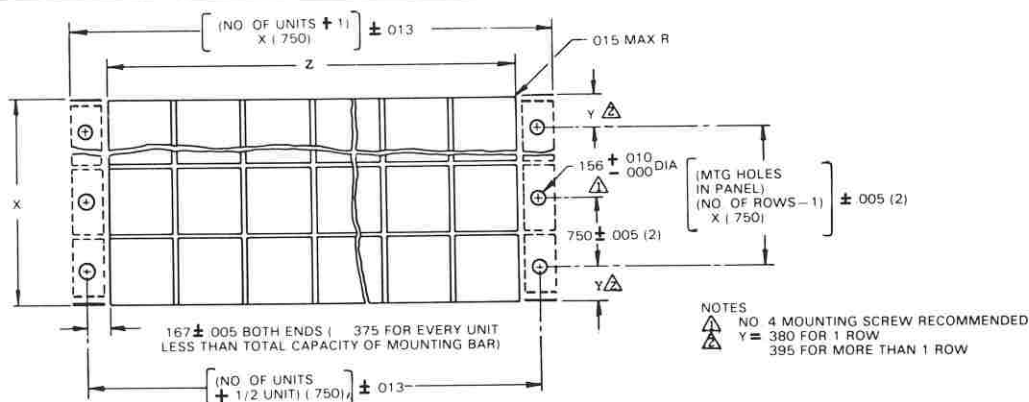
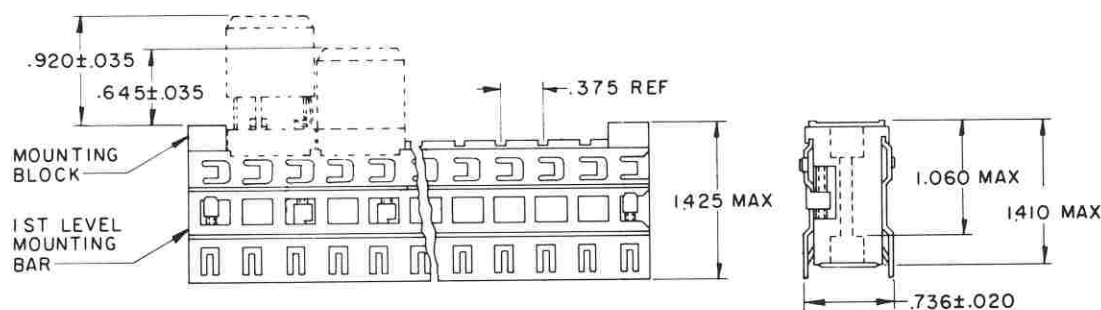
**Pricing subject to Discount R. Product Class 126. Minimum Schedule Quantity — 5 pieces. See Terms and Conditions.

COMPLETELY ASSEMBLED STRIPS OR MATRICES USING TYPE 3M MOUNTING HARDWARE

MICRO SWITCH will provide completely assembled strips or matrices at an additional charge of \$.40 per station of first level devices (switches) with no set-up charge. Contact your MICRO SWITCH Branch Office for pricing of assembled strips or matrices and assembled mechanically interlocked second level devices.

MOUNTING AND CUTOUT INFORMATION

For 3A, 3E, 3B, 3K, and 3C units using 3M Type Mounting Hardware.



No. of Rows	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
"X" & "Z" DIMENSION ±0.010	0.760	1.540	2.290	3.040	3.790	4.540	5.290	6.040	6.790	7.540	8.290	9.040	9.790	10.540	11.290	12.040

SERIES 3 LIGHTED PUSHBUTTON SWITCHES

BUTTONS

ORDERING INFORMATION

Three Piece — (Cap, Legend/Diffuser Plate, and Lampholder)

Releasable Buttons

BUTTON	CONSTRUCTION	SHELL COLOR	DISPLAY COLOR*	CAP COLOR	LEGEND	LAMPS
3D For use with power and reed switches and indicators 3N U.L. listed for use only with UL listed power and reed switches.	1 Single-section display 2 Two-section display	1 Black 2 Gray	W white R red G green B blue Y yellow D orange	1 trans-parent colorless	Switch Buttons: L with legend N w/o legend Indicator Buttons: M with legend P w/o legend	1 one 5 volt 2 two 5 volt 3 one 28 volt 4 two 28 volt

One Piece Non-Releasable Buttons

BUTTON	CONSTRUCTION	DISPLAY COLOR	LEGEND	LAMPS
3D For use with power and reed switches and indicators	3 Flat style, single-section 4 Truncated style, single-section	W white R red G green B blue Y yellow	Switch Buttons: L with legend N w/o legend Indicator Buttons: M with legend P w/o legend	1 one 5 volt 2 two 5 volt 3 one 28 volt 4 two 28 volt

Example: 3D3-WL-1: Complete listing for a one-piece flat button legended, white, one 5 volt lamp.

3D4-WL-1: Complete listing for a one-piece truncated style switch button, white, legended, one 5 volt lamp.

All 3D4 type buttons will be engraved legending.

For engraving prices contact your nearest MICRO SWITCH Branch Office.

Hidden color and hidden legending available on request. Contact your nearest MICRO SWITCH Branch Office.

*For single-section buttons, enter a double letter at this position in the Catalog Listing. Example: Red = RR

When ordering two-section buttons, add the letter for Side 1 first. Example: If you desire Side 1 to be Red and Side 2 Blue, enter RB.

View from top of two-section button

Side 1
Side 2

← Keyed corner

BUTTON PRICING**	LIST PRICE
Single-section button, without lamps or legend 3N1, 3D1, 3D3, and 3D4 types.	\$1.25
Two-section button 3N2 and 3D2 type.	1.85
Hot brand legend per button (does not apply to 3D4 type)	Add .25
Lamps (assembled in button)	
5 volt	Add .80 each
28 volt	Add 1.35 each

**Pricing subject to Discount R. Product Class 124. Minimum Schedule Quantity — 15 Pieces. See Terms and Conditions.

MICRO SWITCH

SERIES 3 LIGHTED PUSHBUTTON SWITCHES

POWER SWITCHES

Add — 1 to listing if connector block is required (3A and 3E modules only).
(Connector blocks have direct wire termination only.)

Example

3A

10

A

MICRO SWITCH

Power Switch Mounting Type	Electrical Code		PRICING *		DESCRIPTION				Color Code	DESCRIPTION	
	Direct Wire	P.C. Term.	Switch Only	Switch with Conn. Block (—1)	Poles	Switch Circuitry	Action	Lamp Ckt(s)		Housing (bezel)**	Barrier
3A For matrix or strip mounting. Requires use of 3M type mounting hardware.	10	70	3.50	4.90	1	Form Z	Mom	2	A F L M N P B G C H D J E K	Black	None
	11		3.00	4.15	1	Form X	Mom	2		Black	Black
	12		3.00	4.15	1	Form Y	Mom	2		Gray	None
	13	71	3.35	4.65	1	Form Z	Mom	1		Gray	Gray
	14		2.85	3.90	1	Form X	Mom	1		White	None
	15		2.85	3.90	1	Form Y	Mom	1		White	White
	20	72	4.50	6.40	2	Form Z	Mom	2		Red	None
	21		3.50	4.90	2	Form X	Mom	2		Red	Red
	22		3.50	4.90	2	Form Y	Mom	2		Green	None
	23		4.00	5.65	2	1(Z), 1(Y)	Mom	2		Green	Green
	24		4.00	5.65	2	1(X), 1(Z)	Mom	2		Blue	None
	25	73	4.35	6.15	2	Form Z	Mom	1		Blue	Blue
	26		3.35	4.65	2	Form X	Mom	1		Yellow	None
	27		3.35	4.65	2	Form Y	Mom	1		Yellow	Yellow
	28		3.85	5.40	2	1(Z), 1(Y)	Mom	1			
	29		3.85	5.40	2	1(X), 1(Z)	Mom	1			
	30	74	3.50	4.90	1	Form Z	Alt	2			
	31		3.00	4.15	1	Form X	Alt	2			
	32		3.00	4.15	1	Form Y	Alt	2			
	33	75	3.35	4.65	1	Form Z	Alt	1			
	34		2.85	3.90	1	Form X	Alt	1			
	35		2.85	3.90	1	Form Y	Alt	1			
	40	76	4.50	6.40	2	Form Z	Alt	2			
3E U.L. listed 3A type device.	41		3.50	4.90	2	Form X	Alt	2			
	42		3.50	4.90	2	Form Y	Alt	2			
	43		4.00	5.65	2	1(Z), 1(Y)	Alt	2			
	44		4.00	5.65	2	1(X), 1(Z)	Alt	2			
	45	77	4.35	6.15	2	Form Z	Alt	1			
	46		3.35	4.65	2	Form X	Alt	1			
	47		3.35	4.65	2	Form Y	Alt	1			
	48		3.85	5.40	2	1(Z), 1(Y)	Alt	1			
	49		3.85	5.40	2	1(X), 1(Z)	Alt	1			
	50		3.20	4.40	1	Form Z	Mom	None			
3F U.L. listed 3G type device.	51		2.70	3.65	1	Form X	Mom	None			
	52		2.70	3.65	1	Form Y	Mom	None			
	53		4.20	5.90	2	Form Z	Mom	None			
	54		3.20	4.40	2	Form X	Mom	None			
	55		3.20	4.40	2	Form Y	Mom	None			
	56		3.70	5.15	2	1(Z), 1(Y)	Mom	None			
	57		3.70	5.15	2	1(X), 1(Z)	Mom	None			
	58		3.20	4.40	1	Form Z	Alt	None			
	59		2.70	3.65	1	Form X	Alt	None			
	60		2.70	3.65	1	Form Y	Alt	None			
	61		4.20	5.90	2	Form Z	Alt	None			
	62		3.20	4.40	2	Form X	Alt	None			
	63		3.20	4.40	2	Form Y	Alt	None			
	64		3.70	5.15	2	1(Z), 1(Y)	Alt	None			
	65		3.70	5.15	2	1(X), 1(Z)	Alt	None			

** Bezel provided with 3G and 3F only.

Circuitry:

X=SPST—N.O.
Double Make



Y=SPST—N.C.
Double Break



Z=SPDT—
Double-Make
Double-Break
Break-before-Make



*Subject to Discount R. Product Class 125, Minimum Schedule Quantity—15 pieces. See Terms and Conditions.

SERIES 3 LIGHTED PUSHBUTTON SWITCHES

INDICATORS

Add —1 if connector block is required
(3C modules only)

Example:

3J

10

A

INDICATOR Mounting Type	Electrical CODE	PRICING*		DESCRIPTION Lamp Circuits(s)	Color CODE	DESCRIPTION	
		Indicator Only	Indicator with Conn. Block (—1)			Housing (bezel**)	Barrier
3C For matrix or strip mounting. Requires use of 3M type mounting hardware	10	1.75	2.50	2	A	Black	None
	11	1.60	2.25	1	F	Black	Black
3J For individual or strip mounting. No additional mounting hardware required.					L	Gray	None
					M	Gray	Gray
					N	White	None
					P	White	White
					B	Red	None
					G	Red	Red
					C	Green	None
					H	Green	Green
					D	Blue	None
					J	Blue	Blue
					E	Yellow	None
					K	Yellow	Yellow
					**Bezel provided with 3J only.		

Printed circuit terminals and UL listed indicators are available on request.
Contact your nearest MICRO SWITCH Branch Office.

* Subject to Discount R. Product Class 125, Minimum Schedule Quantity—15 pieces. See Terms and Conditions.

MICRO SWITCH

REED SWITCHES

Add —1 if connector block is required (3B and 3K modules only).
(Connector blocks have direct wire termination only.)

Example:

3B

10

A

REED SWITCH Mounting Type	Electrical Code		PRICING*		DESCRIPTION				Color Code	DESCRIPTION	
	Direct Wire	Printed Circuit Term.	Switch Only	Switch with Conn. Block (—1)	Pole(s)	Switch Circuitry	Action	Lamp Ckt(s)		Housing (bezel**)	Barrier
3B For matrix or strip mounting. Requires use of 3M type mounting hardware.	10	50	3.75	4.75	1	Form A (N.O.)	Mom	2	A	Black	None
	11	51	3.60	4.50	1	Form A (N.O.)	Mom	1	F	Black	Black
	20	60	4.85	5.85	2	Form A (N.O.)	Mom	2	L	Gray	None
	21	61	4.70	6.00	2	Form A (N.O.)	Mom	1	M	Gray	Gray
	30	70	3.75	4.75	1	Form A (N.O.)	Alt	2	N	White	None
	31	71	3.60	4.50	1	Form A (N.O.)	Alt	1	P	White	White
	40	80	4.85	6.25	2	Form A (N.O.)	Alt	2	B	Red	None
	41	81	4.70	6.00	2	Form A (N.O.)	Alt	1	G	Red	Red
									C	Green	None
									H	Green	Green
3H For individual or strip mounting. No additional hardware required.									D	Blue	None
									J	Blue	Blue
									E	Yellow	None
									K	Yellow	Yellow
3K U.L. listed 3B type device.									**Bezel provided with 3H and 3L only.		
3L U.L. listed 3H type device.									**Bezel provided with 3H and 3L only.		

*Subject to Discount R. Product Class 125. Minimum Schedule Quantity — 15 pieces.
See Terms and Conditions.

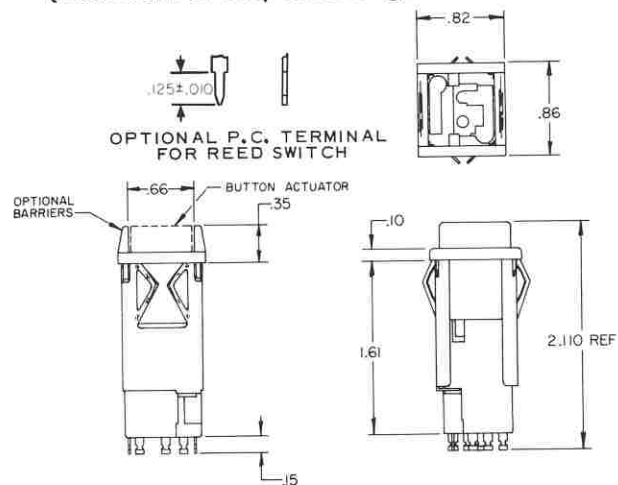
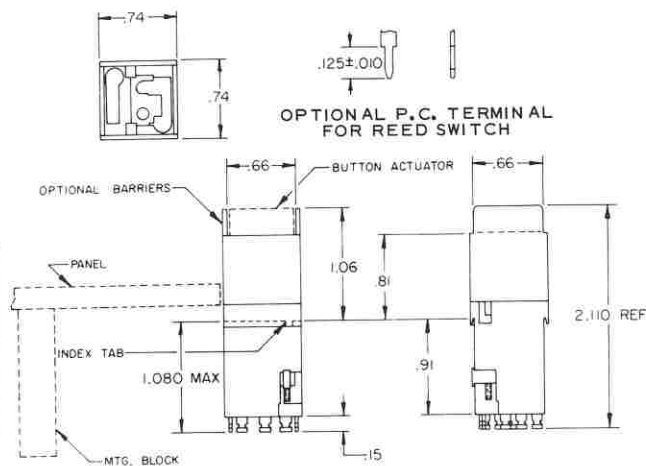
SERIES 3 LIGHTED PUSHBUTTON SWITCHES

MOUNTING DIMENSIONS

SWITCHES AND INDICATORS

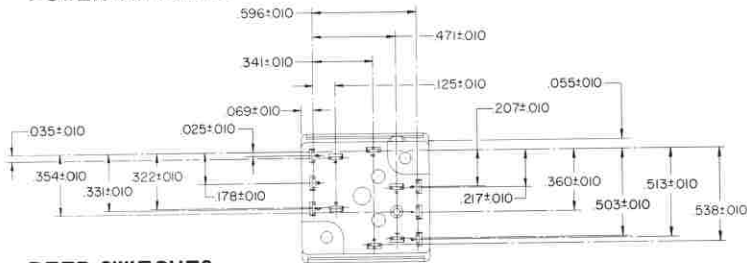
For use with 3M mounting hardware
(Matrix or strip mounting)

For Snap-in panel attachment
(Individual or strip mounting)

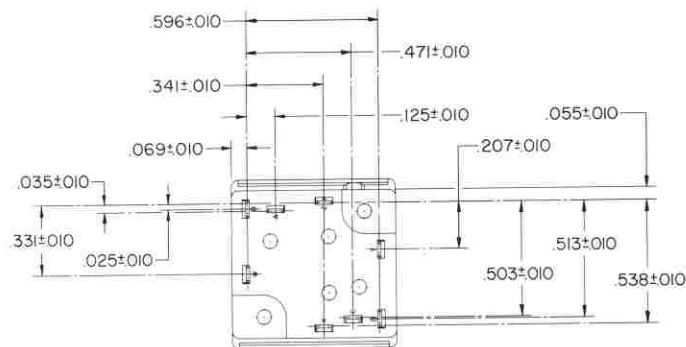


TERMINATION DETAILS

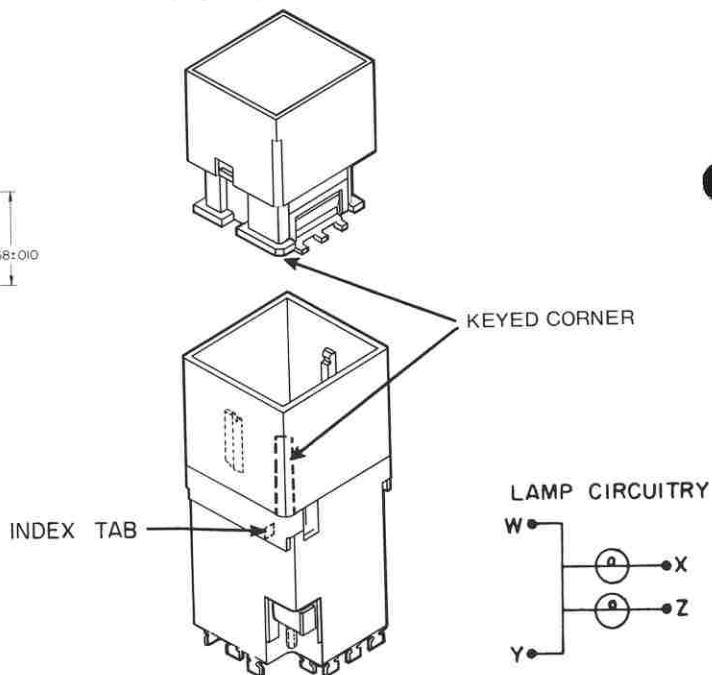
POWER SWITCHES



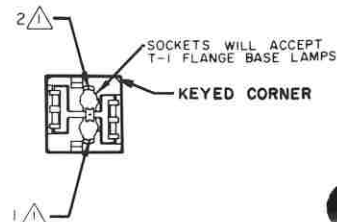
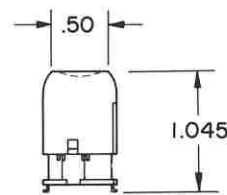
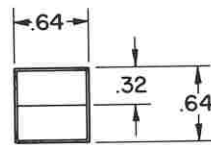
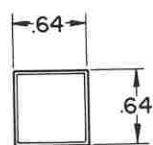
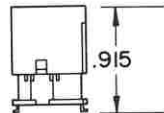
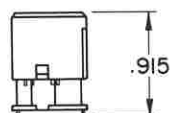
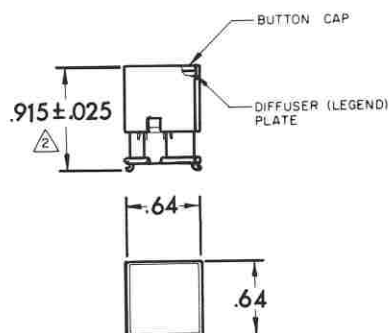
REED SWITCHES



BUTTON KEYED TO HOUSING



BUTTON



NOTE -
LAMP POSITION "1" IS LIGHTED BY TERMINAL "X"
(CIRCUIT "X"), WHILE "2" IS LIGHTED BY
TERMINAL "Z" (CIRCUIT "Z")
EXTENDED POSITION

"SERIES 3"
LEGEND ORDER SHEET

INSTRUCTIONS: | 1. Select desired button legend from examples below (*Ref. Chart C*).
Different legends and/or legend configurations may be included on one order sheet for the same button catalog listing. (*ONE Order Sheet required for EACH button catalog listing.*)

2. Indicate button Figure number (Ref. Chart A).

3. Check legend size and legend color.

4. Indicate button quantity required. (If a complete set of alphabetical characters is desired, "button quantity" column must indicate 26. "Legend description" column will then indicate "A" thru "Z" under 1st Row. For numerals, "button quantity" column may indicate 9 and the "legend description" column "1" thru "9.")

5. Fill in legend description. (DO NOT EXCEED MAXIMUM NUMBER OF CHARACTERS PER LINE AS INDICATED BY CHART B).

BUTTON CATALOG LISTING		3D		-		-	
CUST. P.O. NO.				CUST. DRAWING NO.			

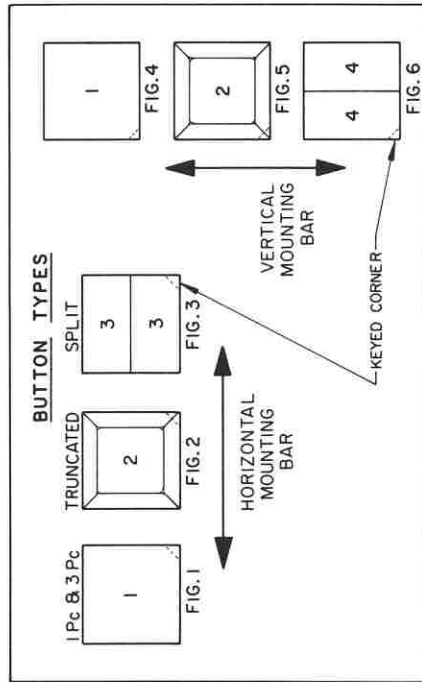
CUSTOMER:

ADDRESS:

(CITY) _____ (STATE)

C	<p>Modified Gothic lettering (A thru Z), numerals (O thru 9) and Symbols below available in 7/64, 9/64 and 13/64 type size.</p>	<p>A 3</p> <p>MODIFIED GOTHIC</p>
STANDARD SYMBOLS AVAILABLE		
.	, ' ?	" / () * & @
\$	¢ # % ° + - ±	> < ∞
→	← ↓	
	$\frac{1}{4}$ $\frac{1}{2}$ $\frac{3}{4}$ $\frac{1}{3}$ $\frac{2}{3}$	

		LEGEND AREA - SEE CHART A							
		1		2		3		4	
TYPE SIZE		MAX. CHAR. per LINE	MAX. LINES per AREA	MAX. CHAR. per LINE	MAX. LINES per AREA	MAX. CHAR. per LINE	MAX. LINES per AREA	MAX. CHAR. per LINE	MAX. LINES per AREA
7/64		5	3	4	2	5	1	2	3
9/64		5	3	4	1	5	1	1	3
13/64		3	2	2	1	3	1	1	2

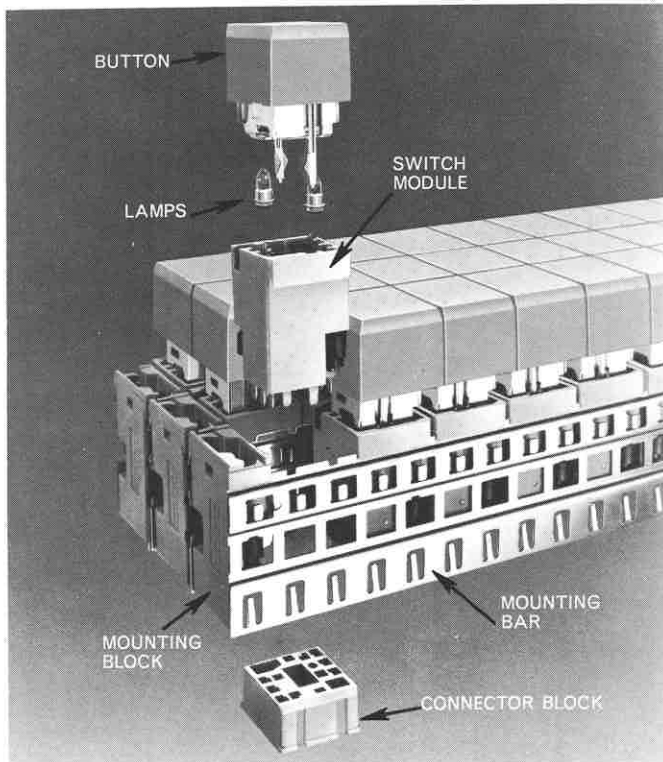


SPECIAL LEGENDS	
<p>NOTE: Use this area to show special legend Locations or Configurations NOT Shown above.</p> <p>NON-STANDARD legends will involve additional charges and increased delivery time.</p>	
FIG. "A"	FIG. "B"
FIG. "C"	FIG. "D"

[illegible][illegible]

KB MATRIX MOUNT PUSHBUTTON SWITCHES

MICRO SWITCH



KB lighted pushbutton switches provide all the design flexibility of pushbutton control in a lighted panel display. Modular construction simplifies the design and alteration of panel layouts. A wide selection of color combinations is available.

SPECIFICATIONS

CONFIGURATION

Switch and Indicators—1-unit ($3/4"$ x $3/4"$) and 1-1/2 unit ($3/4"$ x $1-1/8"$).

MOUNTING

Mounting bars of the modular mounting system are the basic support structure of the KB mounting concept. They are joined together by mounting blocks to form a "box girder" framework. This adds strength to the panel.

A matrix may be any size or shape, depending on unit size of switches and indicators. A single row will hold up to sixteen 1-unit size types or up to ten 1-1/2-unit size. Row width is $3/4"$.

CIRCUITRY

1-unit, up to 2-pole (form Z) DTDB. 1-1/2 unit, up to 4-poles (form Z) DTDB.

ELECTRICAL RATING (Amps)

Silver Contacts
5 amp res. and ind., 115 and 230 vac.
5 amp res. and 3 amp ind., 28 vdc.

STROKE

.250" nominal.
Latch-down position of alternate action—.187" nominal.

50

- COMPLETE FLEXIBILITY IN LIGHTED DISPLAY AND ARRANGEMENT
- VARIETY OF DISPLAY IN SINGLE-COLOR AND TWO-COLOR COMBINATIONS
- PLUG-IN SWITCH AND INDICATING MODULES
- FRONT-OF-PANEL REPLACEMENT OF SWITCHES, INDICATORS AND LAMPS
- STRIP AND MATRIX MOUNT
- OPTIONAL FEATURES — SPACERS AND MECHANICAL INTERLOCKS

Switches are highly adaptable to many commercial applications. They provide freedom of design in building panels. KB switches can be mounted in a single hole cutout for strip or matrix mounting. Row lengths can have up to 16 units in 1/2-unit increments.

The matrix can be easily put together and wired on the bench. Plug-in switches, indicators and lamps are easily added or replaced from the front-of-panel without special tools. This permits fast assembly and easy field changes.

Spacers can be used to fill openings in rows and provide expansion space.

TERMINATION

Wiring is accomplished by soldering leads to connector blocks. Switches and indicators plug into the connector blocks. They can be removed without disturbing the wiring hardware. Terminals for switches and connector blocks are capable of accepting up to two No. 20 gauge wire.

LAMP DATA

Up to four T-1 flange based long-life lamps per button. Addition or removal of lamps can be accomplished from front-of-panel without tools.

MECHANICAL INTERLOCK SYSTEM

KB devices have a compatible mechanical interlock system. Please contact your local branch office for ordering information.

ORDERING INFORMATION

For each strip or matrix, the following is needed:

Per Station

7B Button
7A Switch or 7C Indicator
7D Connector Block

Each Row Requires

A 3M1 Mounting Strip

AND MATCHING INDICATORS

BUTTONS

Buttons are available in single-piece or two-piece (relegendable) type construction in both 1-unit (3/4" x 3/4") and 1-1/2 unit (3/4" x 1-1/8") sizes. Either button construction may have single-section or two-section split display.

HOW TO ORDER KB BUTTONS

Listings for the 1-unit and 1-1/2 unit KB buttons are derived by selecting the proper feature characters for each of the seven options charted below.

DISPLAY COLOR OPTIONS

Transmitted (colored lens) and **Projected** (using color filter which makes color visible only when lighted) available in 5 colors: red, green, blue, yellow and white.

LEGENDING SERVICE

MICRO SWITCH will provide hot stamp legending in 7/64", 9/64" and 13/64" characters for either one-piece or two-piece button construction. (See Form No. 62302—Legend Order Sheet.)

TYPE BUTTON	CONSTRUCTION	COLOR	LEGEND	DISPLAY COLOR	LAMP TYPE	LAMP POSITIONS & NUMBER OF LAMPS																																																																																				
7B1C 1-Unit (Lighted) 7B1E 1-1/2 Unit (Lighted)	01 —Single Section 07 Two-Section (Split in Line with Mounting Bars) 16 —Re-Legendable (Single Section) 17 —Two-Section (Re-Legendable Split in Line with Mounting Bars)	<p>View from top of button.</p> <div><div><div>① Side 1</div><div>②</div><div>③ Side 2</div><div>④</div></div><div>Mounting Bar Orientation</div></div> <p>Side 1 (Circuit X) Side 2 (Circuit Z)</p> <table><tr><td>Single Section</td><td>*Two Section</td><td></td></tr><tr><td>RR</td><td>Side 1 R</td><td>Side 2 R</td></tr><tr><td>BB</td><td>B</td><td>B</td></tr><tr><td>GG</td><td>G</td><td>G</td></tr><tr><td>YY</td><td>Y</td><td>Y</td></tr><tr><td>WW</td><td>W</td><td>W</td></tr></table> <p>Specify White Button (WW) if Projected Color is desired.</p> <p>*Example: If you desire Side 1 to be Red and Side 2 Blue, add RB at this position in the catalog listing.</p>	Single Section	*Two Section		RR	Side 1 R	Side 2 R	BB	B	B	GG	G	G	YY	Y	Y	WW	W	W	01 —No Legend (With Matte Finish Surface Coating Applied on Button) 02 —No Legend (Without Matte Finish Coating on Button) 03 —Legended Button (With Matte Finish Surface Coating Applied)	<p>If TRANSMITTED COLOR is Specified, Insert XX. To Specify PROJECTED COLOR, Use Chart Below.</p> <table><tr><th>Color Filters</th><th>Circuit X</th><th>Circuit Z</th></tr><tr><td>AA</td><td>Red</td><td>None</td></tr><tr><td>AB</td><td>Blue</td><td>None</td></tr><tr><td>AC</td><td>Green</td><td>None</td></tr><tr><td>AD</td><td>Yellow</td><td>None</td></tr><tr><td>AE</td><td>White</td><td>None</td></tr><tr><td>AF</td><td>Red</td><td>Blue</td></tr><tr><td>AG</td><td>Red</td><td>Green</td></tr><tr><td>AH</td><td>Red</td><td>Yellow</td></tr><tr><td>AJ</td><td>Red</td><td>White</td></tr><tr><td>AK</td><td>Blue</td><td>Green</td></tr><tr><td>AL</td><td>Blue</td><td>Yellow</td></tr><tr><td>AM</td><td>Blue</td><td>White</td></tr><tr><td>AN</td><td>Green</td><td>Yellow</td></tr><tr><td>AP</td><td>Green</td><td>White</td></tr><tr><td>AR</td><td>Yellow</td><td>White</td></tr></table>	Color Filters	Circuit X	Circuit Z	AA	Red	None	AB	Blue	None	AC	Green	None	AD	Yellow	None	AE	White	None	AF	Red	Blue	AG	Red	Green	AH	Red	Yellow	AJ	Red	White	AK	Blue	Green	AL	Blue	Yellow	AM	Blue	White	AN	Green	Yellow	AP	Green	White	AR	Yellow	White	01 —No Lamps 02 —T-1 Type No. 718, 5 Volt, .115 amp 06 —T-1 Type, No. 6839, 28 Volt, .024 amps	<p>View from top and mounting bar position.</p> <div><div><div>① Side 1</div><div>②</div><div>③ Side 2</div><div>④</div></div><div>Mounting Bar Orientation</div></div> <p>Side 1 (Circuit X) Side 2 (Circuit Z)</p> <table><tr><th></th><th>1 or 1-1/2 Unit Button</th><th></th></tr><tr><th></th><th>No. of Lamps</th><th>Lamp Positions</th></tr><tr><td>A</td><td>0</td><td>—</td></tr><tr><td>B</td><td>1</td><td>2</td></tr><tr><td>C</td><td>2</td><td>1 & 2</td></tr><tr><td>*D</td><td>4</td><td>1, 2, 3 & 4</td></tr></table> <p>LAMP CIRCUIT</p> <p>Terminals "W" and "Y" are common. Series wiring (connection of "X" and "Z" for 4-lamp hook-up) is not recommended.</p> <p>*Do not light more than 2 lamps at one time.</p>		1 or 1-1/2 Unit Button			No. of Lamps	Lamp Positions	A	0	—	B	1	2	C	2	1 & 2	*D	4	1, 2, 3 & 4
Single Section	*Two Section																																																																																									
RR	Side 1 R	Side 2 R																																																																																								
BB	B	B																																																																																								
GG	G	G																																																																																								
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AN	Green	Yellow																																																																																								
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C	2	1 & 2																																																																																								
*D	4	1, 2, 3 & 4																																																																																								

EXAMPLE:

A 7B1C-01WW3-AA02C listing is given below. This is a single-section lighted button with legend for a 1-unit single-level construction switch. Display color is projected red in Circuit X. The two lamps are type T-1 (5 Volt). Lamps and filters are supplied ready-installed in the button when specified in the catalog listing.

Type	Construction	Color	Legend	Display	Lamp Type	Lamp Position & No. of Lamps
7B1C (1-Unit Lighted)	01 Single-Section	WW (WW is used since Projected Color is Specified)	3 Submit FO 62302 for Legend Instruction	AA Red in Position 1 and 2, Circuit X	02 T1—5 Volt	C 2 Lamps in Positions 1 & 2 in Circuit X

LIST PRICING*

Listing	Type	Base Price	
KB Buttons	7 B1C-01	\$1.05	ADD the following to BASE PRICE: For Legend \$.25 For 2 Color Filters \$.32 For 4 Color Filters \$.64
	7 B1C-07	1.90	
	7 B1C-16	1.30	
	7 B1C-17	2.15	
	7 B1E-01	1.20	
	7 B1E-07	2.05	
	7 B1E-16	1.50	
Lamps	5 Volt (718 Type)	.80 ea.	
	28 Volt (6839 Type)	1.35 ea.	

Product Class 137. Minimum Schedule Quantity—15 pieces.

*Prices Subject to Discount R. See Terms and Conditions.

MICRO SWITCH

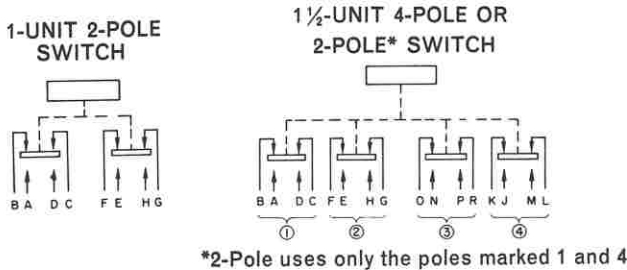
KB MATRIX MOUNT PUSHBUTTON SWITCHES

KB SWITCHES

Select desired switch listing from chart below.

Catalog Listing	Switch Action	Poles & Sizes	List Price*
7A1DA	Momentary-Action	1-Pole 1-Unit	\$4.30
7A1DC	Alternate-Action	1-Pole 1-Unit	4.65
7A1CA	Momentary-Action	2-Pole 1-Unit	5.65
7A1CC	Alternate-Action	2-Pole 1-Unit	6.00
7A1GA	Momentary-Action	2-Pole 1-1/2 Unit	6.30
7A1GC	Alternate-Action	2-Pole 1-1/2 Unit	6.70
7A1EA	Momentary-Action	4-Pole 1-1/2 Unit	8.60
7A1EC	Alternate-Action	4-Pole 1-1/2 Unit	9.00

*Prices Subject to Discount R. See Terms and Conditions.
Product Class 136. Minimum Schedule Quantity—15 pieces.



KB MATCHING INDICATORS

KB matching indicators show circuit status by lighted display. They are similar in appearance to the 1 and 1-1/2 unit pushbutton switches, except indicators hold the button depressed and have no switching function.

Catalog Listing	Indicator Size	Use With Button Type	List Price*
7C1	1 Unit	Single Level 1-Unit Button 2 Lamp Circuit	\$2.00
7C3	1 Unit	Single Level 1-Unit Button 1 Lamp Circuit	1.85
7C2	1-1/2 Unit	Single Level 1-1/2 Unit Button (Only) 2 Lamp Circuit	2.15

*Prices Subject to Discount R. See Terms and Conditions.
Product Class 136. Minimum Schedule Quantity—15 pieces.

WIRING HARDWARE

Connector blocks plug-in at the base of switches and indicators provide means of attaching leadwires. Terminal locations are marked for identification. A connector block consists of a terminal housing with terminals inserted in all positions.

Catalog Listing	Size	Description	List Price*
7D7	1 Unit	Connector Block (Terminal Housing with 12 terminals inserted)	\$1.90
7D8	1-1/2 Unit	Connector Block (Terminal Housing with 20 terminals inserted)	2.90

*Prices Subject to Discount R. See Terms and Conditions.
Product Class 138. Minimum Schedule Quantity—15 pieces.

MATRIX MOUNTING HARDWARE

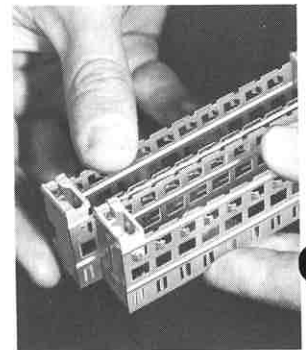
Mounting hardware for KB switches and matching indicators is provided by means of a box girder structure. Mounting rows have interlocking tabs to facilitate assembly of a multi-row matrix. Listings given below are sets of mounting parts for mounting KB devices.

Each listing consists of two mounting bars and two mounting blocks in packet form.

Catalog Listing Prefix	Row-Length Suffix (1/2 Unit Increments)
3M1 - (Furnished with standard type mounting bars, for use with connector blocks for plug-in wiring.)	01—1 Unit 02—1-1/2 Unit 03—2 Unit 04—2-1/2 Unit 05—3 Unit 06—3-1/2 Unit 07—4 Unit 08—4-1/2 Unit 09—5 Unit 10—5-1/2 Unit 11—6 Unit 12—6-1/2 Unit 13—7 Unit 14—7-1/2 Unit 15—8 Unit 16—8-1/2 Unit 17—9 Unit 18—9-1/2 Unit 19—10 Unit 20—10-1/2 Unit 21—11 Unit 22—11-1/2 Unit 23—12 Unit 24—12-1/2 Unit 25—13 Unit 26—13-1/2 Unit 27—14 Unit 28—14-1/2 Unit 29—15 Unit 30—15-1/2 Unit 31—16 Unit
3M2 - (Furnished with narrow width mounting bars, to allow direct wiring.)	
Example: 3M1-17	
is a 9 unit long mounting packet.	

Catalog No.	List Price
3M1-01 through 15	\$1.80
3M1-16 through 31	2.35
3M2-01 through 15	1.65
3M2-16 through 31	2.10

*Prices Subject to Discount R.
See Terms and Conditions.
Product Class 126. Minimum Schedule Quantity— 5 Pieces.



If a multiple-row or matrix build-up is desired, snap together the required number of mounting sub-assemblies.

SPACER PACKETS

Spacers are used to fill openings in rows of functional modules, provide expansion space, or act as barriers against accidental operation.

The 7G1D spacer packet contains a high level 1/2 unit spacer plus a mounting block.

1/2 Unit
High Level



A 1/2-unit
spacer is
3/4" x 3/8"

Catalog No.	List Price
7G1D Spacer	\$1.05

*Prices Subject to Discount R.
See Terms and Conditions.
See Terms and Conditions.
Product Class 141.
Minimum Schedule Quantity— 5 pieces.

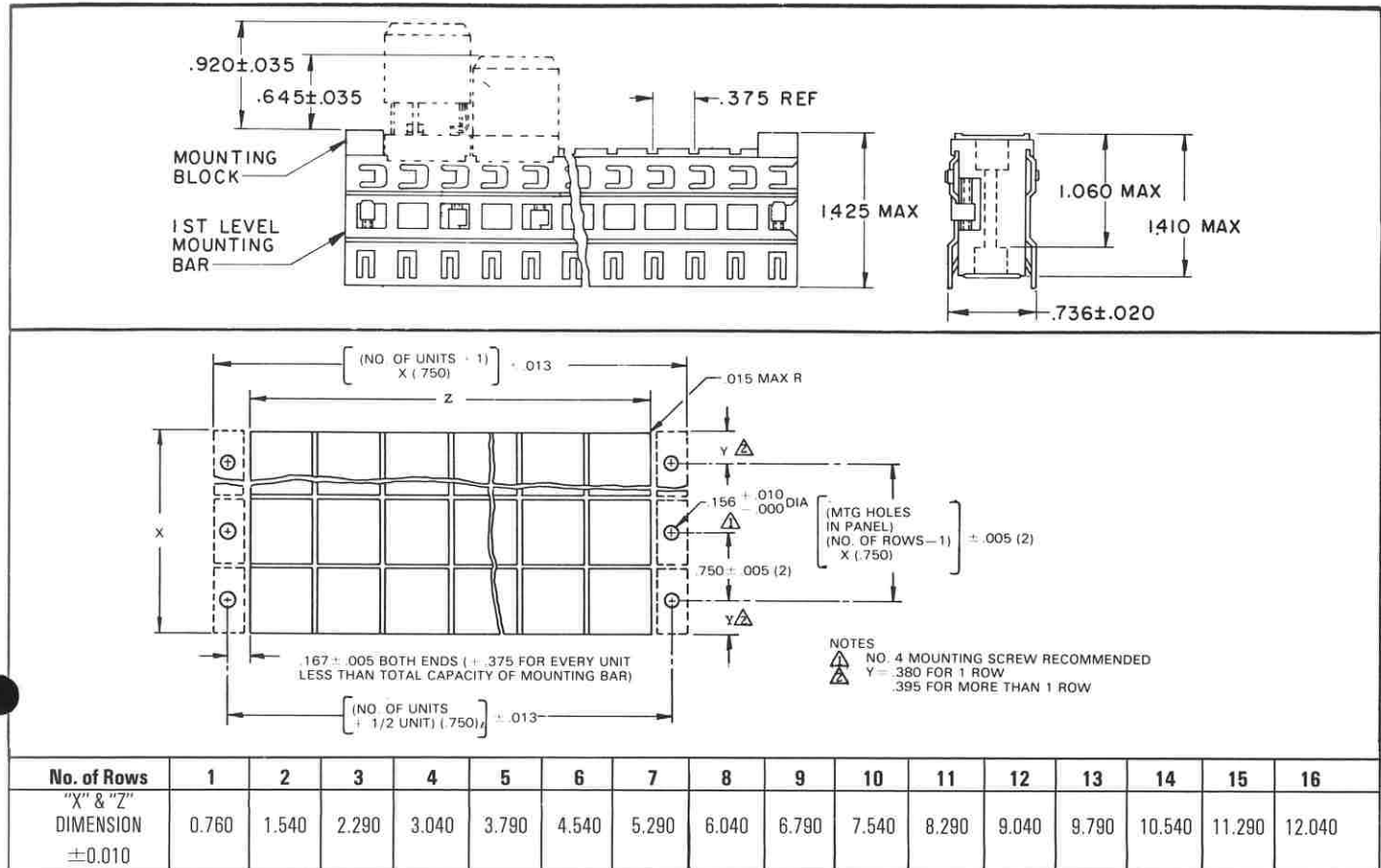
Color	1/2 Unit High Level
Red	7G1DR
Blue	7G1DB
Green	7G1DG
Yellow	7G1DY
White	7G1DW
Black	7G1DK
Gray	7G1DG

AND MATCHING INDICATORS

ADDITIONAL FEATURES

Many other additional features and modifications are available as well as testing information. Please contact your local branch office for details.

MOUNTING AND CUTOUT INFORMATION



MICRO SWITCH

REED SWITCHES

- DESIGNED FOR KEYBOARD DATA ENTRY
- HERMETICALLY SEALED CONTACTS
- LONG LIFE
- MOMENTARY AND ALTERNATE ACTION

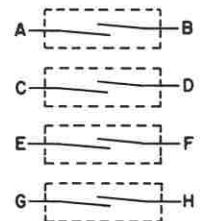
Specially designed for keyboard data entry, the hermetically sealed contacts of the KB Reed Switch are immune to contamination. Turret design terminals enable direct wiring to switch, plug-in wiring to connector blocks, and application to printed circuits keyboards.

MICRO SWITCH also offers wired and encoded Reed Switch keyboards and all solid state keyboards. Contact our nearest Branch Office for details.

molded in the first shot and the button's outer portion is molded around it. There are no depressions in the legend area to fill with dirt and a smooth surface provides operating comfort.

Button surface is $1/2$ " square to provide ample legending area and an easy striking target.

CONTACT ARRANGEMENT



ELECTRICAL RATINGS

ALTERNATING CURRENT
 12VA Max - Inrush or Resistive
 Max. Voltage: 240 vac @ 12VA
 Max. Current: 250 milliamps @ 12 VA

DIRECT CURRENT
 8 Watts Maximum Resistive only
 Max. Voltage: 240 vdc @ 8 Watts
 Max. Current: 250 milliamps @ 8 Watts

Vac 60 Cy.	Maximum Current in Milliamps	Volts DC	Maximum Current in Milliamps
0-48	250	0-32	250
120	100	120	66
240	50	240	33

A truncated button style was selected after extensive study of appearance aspects, human factors, durability, and legending techniques. Legend durability is assured because of the double-shot molding technique. The legend is



BRANCH OFFICES

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Cleveland, Ohio 44103
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Dallas, Texas 75206
6000 North Central Expressway
214/363-5441

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319/355-6456

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2314 Stanley Avenue
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313/352-1900

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885 Wethersfield Avenue
203/527-0178

Houston, Texas 77042
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713/785-3200

Indianapolis, Indiana 46241
5739 Professional Circle
317/243-0831

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816/358-4200

Long Island City, New York 11101
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213/723-6611

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2979 North Mayfair Road
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Minneapolis, Minnesota 55435
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612/835-5400

Philadelphia Office
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Merion-Towle House
1777 Walton Road
215/643-5820

Rochester, New York 14623
100 Metro Park
716/461-1600

St. Louis Office
Creve Coeur, Missouri 63141
10000 Old Olive Street Road
314/991-4100

San Francisco Office
Sunnyvale, California 94086
910 Thompson Place
408/732-0120

Seattle Office
Mercer Island, Washington 98040
9555 S.E. 36th Street
206/232-5030

Syracuse Office
Liverpool, New York 13088
7485 7th North Street
315/451-4000

Washington, D.C. Office
McLean, Va. 22101
1766 Old Meadow Lane
703/893-4660

Westchester Office
Elmsford, New York 10523
570 Taxter Road
914/592-3200

Westfield, N.J. 07090
574 Springfield Avenue
201/233-9200

Wichita, Kansas 67216
2801 South Madisor
316/522-3435

MICRO SWITCH

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