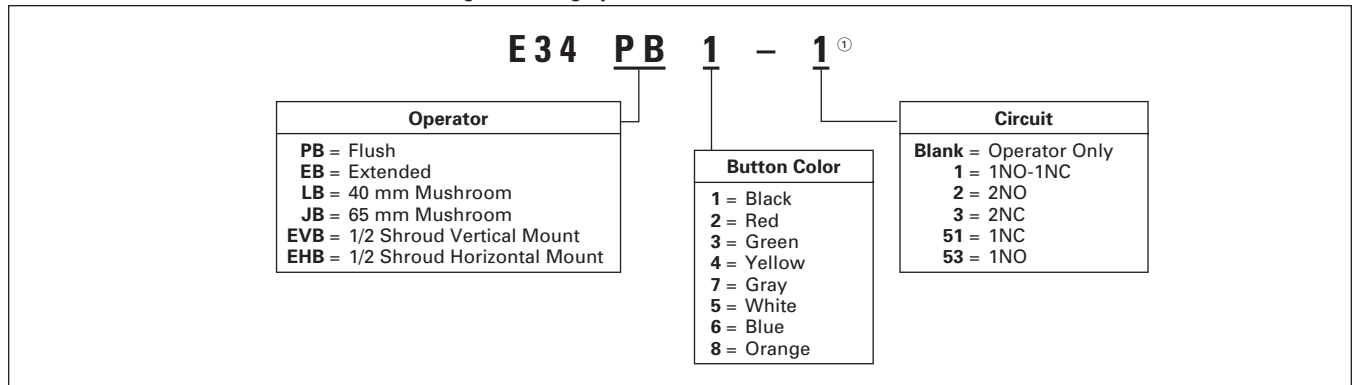


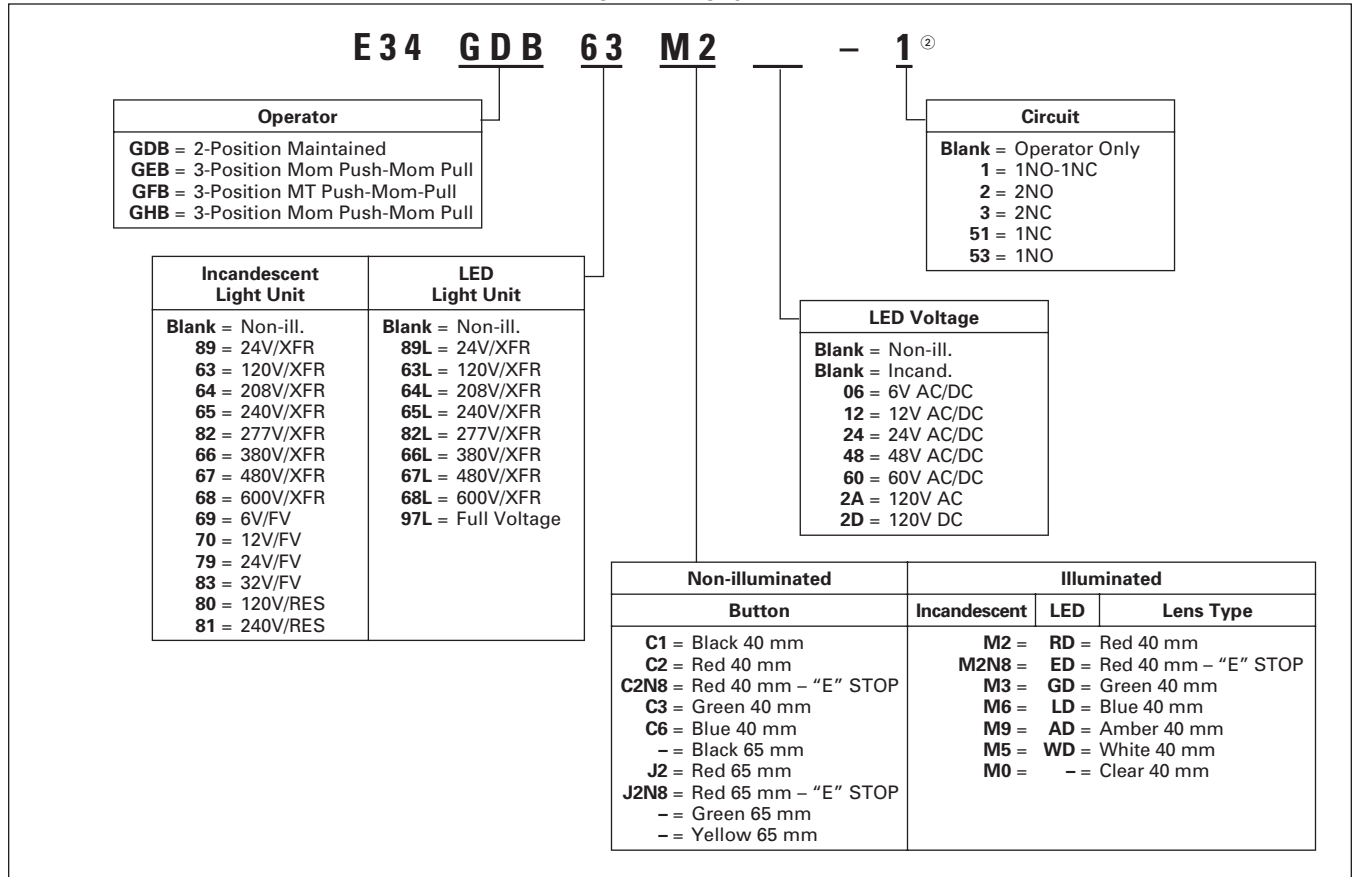
**Catalog Number Structure**

**Table 47-313. Non-illuminated Pushbuttons Catalog Numbering System**



① Add X at end of Catalog Number to receive parts assembled from factory.

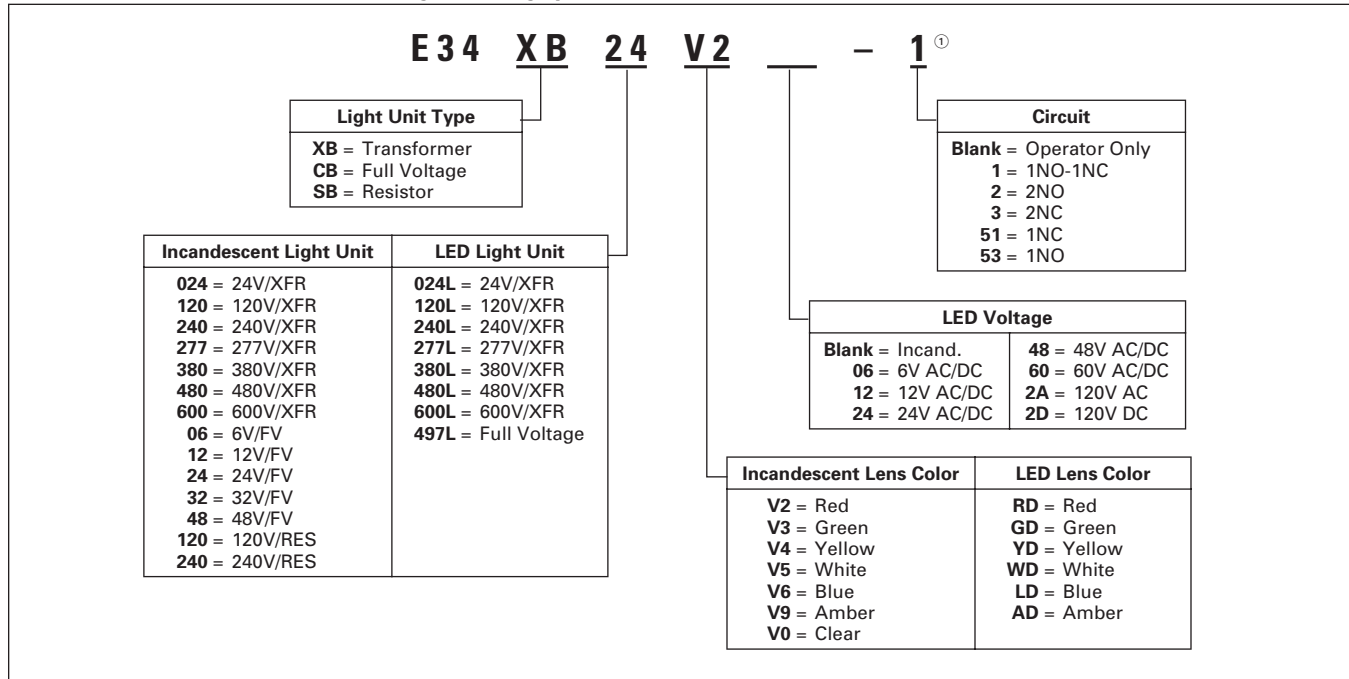
**Table 47-314. Illuminated and Non-illuminated Push-Pulls Catalog Numbering System**



② Add X at end of Catalog Number to receive parts assembled from factory.

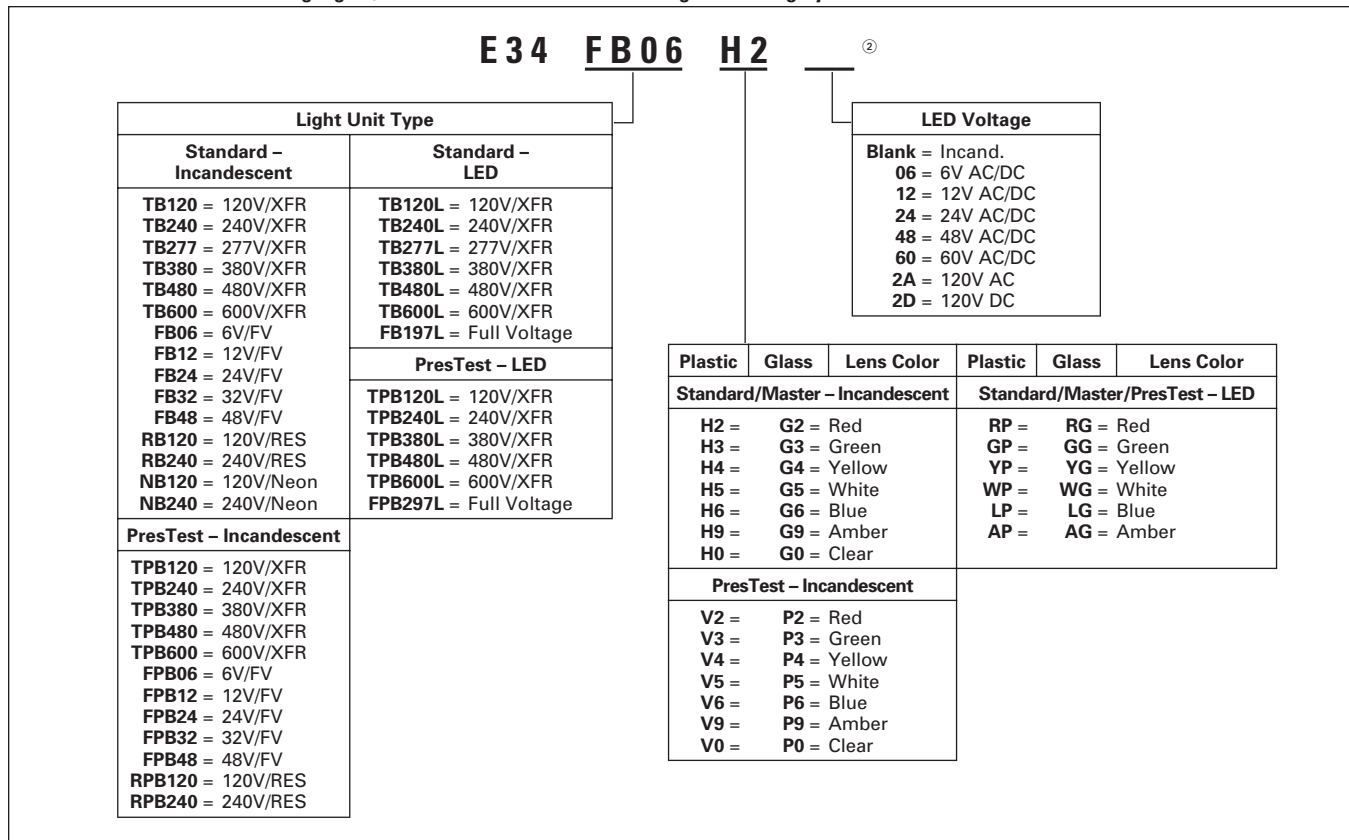
E34 Series, Catalog Number Structure

Table 47-315. Illuminated Pushbuttons Catalog Numbering System



① Add X at end of Catalog Number to receive parts assembled from factory.

Table 47-316. Standard Indicating Lights, PresTest and Master Test Catalog Numbering System



② Add X at end of Catalog Number to receive parts assembled from factory.

**E34 Series, Assembled Devices — Selector Switch Units**

**Selector Switch Units**

- Two-, Three- and Four-Position — Maintained
- Non-illuminated and Illuminated



*2-Position  
Maintained  
Switch Knob*



*4-Position  
Maintained  
Switch Lever*

**Table 47-282. 2-Position Selector Switch — UL (NEMA) Type 3, 3R, 4, 4X, 12, 13**

Operator Position ①		Operator Action ②	Non-illuminated		Price U.S. \$	Illuminated — 120V Transformer		Price U.S. \$	Contact Type	Mounting Location		Cam Code
			Black Knob ③	Black Lever ③		Red Knob ③	Red Lever ③			A	B	
Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number							
X O	O X		E34VFBK1-1X	E34VFBL1-1X		E34VFB120ER-1X	E34VFB120FR-1X		1NC 1NO			1

① X = closed circuit, O = open circuit.

② M = Maintained.

③ To order different type or color selector switch, substitute the underlined character with appropriate Suffix Code from the Color Selection table.  
 Example: E34VFBK2-X1.

**Table 47-283. 3-Position Selector Switch — UL (NEMA) Type 3, 3R, 4, 4X, 12, 13**

Operator Position ④			Operator Action ⑤	Non-illuminated		Price U.S. \$	Illuminated — 120V Transformer		Price U.S. \$	Contact Type	Mounting Location		Cam Code
				Black Knob ⑥	Black Lever ⑥		Red Knob ⑥	Red Lever ⑥			A	B	
Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number						
X O	O O	O X		E34VHBK1-2X	E34VHBL1-2X		E34VHB120TER-2X	E34VHB120TFR-2X		1NO 1NO			3
X O	O X	O O		E34VHBK1-23X	E34VHBL1-23X		E34VHB120TER-23X	E34VHB120TFR-23X		1NO 2NC (Series) 1NO			3

④ X = closed circuit, O = open circuit.

⑤ M = Maintained.

⑥ To order different type or color selector switch, substitute the underlined character with appropriate Suffix Code from the Color Selection table.  
 Example: E34VFBK2-X1.

**Table 47-284. 4-Position Selector Switch — UL (NEMA) Type 3, 3R, 4, 4X, 12, 13**

Operator Position ⑦				Operator Action ⑧	Non-illuminated		Price U.S. \$	Illuminated — 120V Transformer		Price U.S. \$	Contact Type	Mounting Location		Cam Code
					Black Knob ⑨	Black Lever ⑨		Red Knob ⑨	Red Lever ⑨			A	B	
Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number							
X O	O X	O O	O O		E34VTBK1-23X	E34VTBL1-23X		E34VRB120TER-23X	E34VRB120TFR-23X		1NC 1NO 1NO 1NC			7

⑦ X = closed circuit, O = open circuit.

⑧ M = Maintained.

⑨ To order different type or color selector switch, substitute the underlined character with appropriate Suffix Code from the Color Selection table.  
 Example: E34VFBK2-X1.

**Table 47-285. Color Selection, Non-illuminated**

Color	Code Letter
Black	1
Red	2
Green	3
Yellow	4
White	5
Blue	6
Gray	7
Orange	8

**Note:** For Light Unit Voltage Suffix and Knobs, Levers tables, see Page 47-181.

**Note:** Use NEMA 4X 10250T operators where exposed to ultraviolet light, see Pages 47-115 – 47-165.

Accessories . . . . . Pages 47-187 – 47-188  
 Additional Circuit Arrangements . . . . . Pages 47-178 – 47-179  
 Dimensions . . . . . Page 47-191  
 Enclosures . . . . . Pages 47-185 – 47-186  
 Legend Plates . . . . . Page 47-184  
 Discount Symbol . . . . . 1CD1C

E34 Series, Selector Switch Selection



E34 Series

Selector Switch Selection

Cam and Contact Block Selection

Selector switches in their varied forms (2-position, 3-position and 4-position) are a big factor contributing to the great flexibility of control that a well rounded line of "pushbuttons" can achieve. Because of their flexibility, they tend to cause difficulty with product selection and application. The following systematic approach should simplify that task.

Cam and contact block selection is better understood if you:

- Work with each incoming and outgoing wire/circuit separately.
- Recognize the terms NO and NC only identify the type of contact by its mode before mounting to the operator. The "X-O" chart (Page 47-179) shows how that contact will act after assembly to the operator with the selected cam shape. X = closed circuit, O = open circuit.
- Up to six NO or NC contacts may be mounted behind each plunger location for a total of twelve contacts. Single circuit contact blocks have only one plunger with the other side of the block "open." Therefore, single circuit contact blocks transmit motion to blocks behind them only for the position containing the circuit.
- Each cam has two separate lobes, each of which operates one of the two contact block plungers independently of each other. Those are identified as position A (locating nib side) and position B (opposite of locating nib). The position designations give direction in selecting and mounting of the contact blocks (see Illustration below).

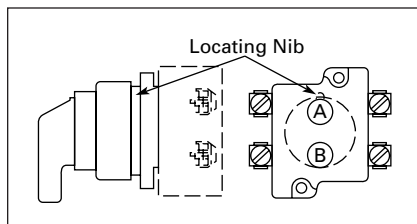


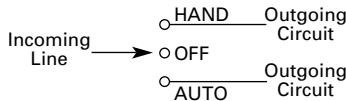
Figure 47-125. Contact Circuit Locations

Systematic Approach

Application: **HAND-OFF-AUTO** Selector Switch. In this circuit, one incoming line is distributed to two other outgoing circuits by the switch. The two circuits can be looked at individually.

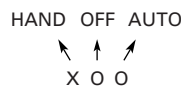
Step 1: Elementary Diagram.

Construct on paper, or in your mind, a simple elementary diagram of the switching scheme as follows:



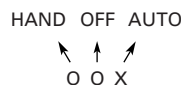
Step 2: "X-O" Pattern.

From the elementary diagram, you can construct an "X-O" diagram which describes when the contacts are to be closed (X) or open (O) in the various positions of the switch. The "X-O" for the **HAND** circuit looks like this:



In this circuit, you want a contact closed on the left (HAND) but open in the center and right.

For the **AUTO** circuit, the "X-O" diagram would look like this:



Putting them together, the complete "X-O" diagram is:



Once the "X-O" diagram has been generated, the next step is to select the cam and contact block, or blocks, needed to perform the desired "X-O" functions. The selection table on the following page lists the various types (shapes) of cams by number to choose from and the type of contact and position to achieve the function outlined in your "X-O" diagram.

Step 3: Cam Selection.

The cam you select determines the operation of all contact blocks mounted to the operator. It is selected on the basis that it provides the simplest circuitry for the desired "X-O" diagram. The selection tables of the following page show all the "X-O" combinations. For the purpose of this example, the applicable portion of those charts is shown in **Table 47-286**.

Table 47-286. Example Selection Table

No.	"X-O" Pattern	Cam Code #2		Cam Code #3	
		Top A	Bottom B	Top A	Bottom B
1	X O O	NO	NC	NO	
4	O O X		NO		NO

① Wired in series.

Now to make the cam selection, make a simple worksheet such as:

		Cam 2	Cam 3
X O O	(A)NO - (B)NC	(A)NO	(B)NO
O O X	(B)NO	(B)NO	

It becomes immediately obvious that cam 3 is the better choice for two reasons, (1) the series combination can be avoided making it simpler to wire, (2) only two contacts are required, which is less expensive than the three contacts required by cam 2.

Step 4: Contact Block Selection.

Having selected the cam, contact block selection is simply a matter of gathering the A position and B position circuits into pairs which make up the most convenient contact block arrangement. If there is an imbalance in the number of circuits under A or B, then single circuit blocks must be selected for these leftover circuits.

Back to the worksheet, having selected cam 3 do this:



Step 5: Selector Switch Operator.

Lastly, you have to choose from the many types of operators — knob and lever in various colors or keyed. Also what combinations of maintained and spring return functions are required. Selection of these operators can be found on **Page 47-180**. For the above example you may want a 3-position maintained black knob, cam 3 — Catalog Number E34VHBK1.

**The Complete Switch:** E34VHBK1 with one 10250T2 or, for one composite catalog number, E34VHBK1-Y1 found on **Page 47-177**.

**Selector Switch Selection**  
**(Continued)**

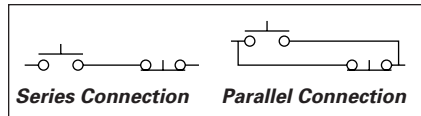
**Table 47-287. 2-Position Selector Switch Contact Block Selection**

No.	Desired Circuit and Operator Position		Contact Blocks Required to Accomplish Circuit Function	
			Top Plunger A	Bottom Plunger B
1	X	O		
2	O	X		

**Diagrams**

Circuits shown illustrate connections to obtain a selector switch circuit combination and are shown with their appropriate line diagrams. Field wiring of jumper connections required as shown.

X = Closed Circuit  
 O = Open Circuit



**Figure 47-126. Wiring of Jumper Connections**

**Note:** 4-Position Selector Switches limited to 4 contact blocks.

**Contact Blocks**

For selection and number of available contact blocks per operator, see **Page 47-182**.

**Table 47-288. 3-Position Switch — Cam and Contact Block Selection**

No.	Desired Circuit and Operator Position	Contact Blocks Required to Accomplish Circuit Function (Jumpers must be installed where indicated)			
		Operator with Cam Code #2		Operator with Cam Code #3	
		Mounting Location		Mounting Location	
		Top Plunger A	Bottom Plunger B	Top Plunger A	Bottom Plunger B
1	X O O	NO		NO	
2	X X O		NC		NC
3	X O X	NO		NO	NO
4	O O X		NO		NO
5	O X X	NC	NO	NC	
6	O X O	NC		NC	NC

**Table 47-289. 4-Position Switch — Contact Block Selection**

No.	Desired Circuit and Operator Position	Contact Blocks Required to Accomplish Circuit Function		Combination No.	Desired Circuit and Operator Position	Contact Blocks Required to Accomplish Circuit Function	
		Mounting Location				Mounting Location	
		Top Plunger A	Bottom Plunger B			Top Plunger A	Bottom Plunger B
1	X O O O	NC		10	X O X O	NC	NO
2	O X O O		NO			NC	NO
3	O O X O	NO		11	X X X O	NC	NO
4	O O O X		NC			NO	NO
5	X O O X	NC	NC	12	O X X X	NO	NC
6	O X X O	NO	NO			NO	NO
7	O O X X	NO	NC	13	X O X X	NO	NC
8	X X O O	NC	NO			NO	NC
9	O X O X		NO	14	X X O X	NC	NO