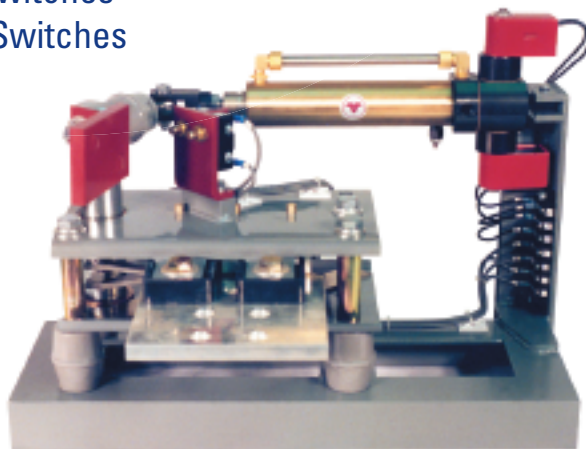




## Type DB High Current Switches

For High Current Industrial Applications

- AC/DC Switchboards
- Rectifier Disconnect Switches
- Contact Rail Switches
- Trolleyline Disconnect Switches
- Motor Control Isolation Switches
- DC Substation Switches



**ISO 9001**  
Quality System Certified

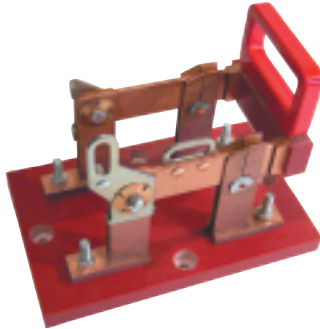
DB Switches

# DB HIGH CURRENT SWITCHES

**Filnor has a variety of switches to suit your needs.**

**A-1111 P2GE**

600 Ampere, 250 Volt DC,  
Two-Pole, Single-Throw  
Switch, With Padlock Feature,  
90° Stop, Not Fusible

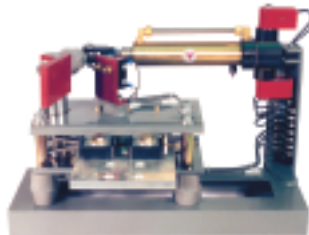


Filnor's Knife Switch product line was purchased from the Square D Company in 1974, and began production of switches in June of that year. The switch line was formerly the Barkeley Electric Company.

We have over 700 standard switches listed in our catalog. The electrical ratings on the switches range from 30 Amperes at 125 Volts AC/DC to 6000 Amperes at 600 Volts AC/DC. Construction styles are a front-connected (steel panel mounting) or back-connected (insulated panel mounting). All of these switches carry the Underwriters Laboratories Listing.

**A-1111 P2GE**

600 Ampere, 250 Volt DC,  
Two-Pole, Single-Throw  
Switch, With Padlock Feature,  
90° Stop, Not Fusible



In conjunction with the standard switch line, we also build many special switch arrangements per our customers' specification. Our special switch units range in current size from 30 Amperes up through 20,000 Amperes, and Voltages up to 38,000 Volts.

**A-1111 P2GE**

600 Ampere, 250 Volt DC,  
Two-Pole, Single-Throw  
Switch, With Padlock Feature,  
90° Stop, Not Fusible



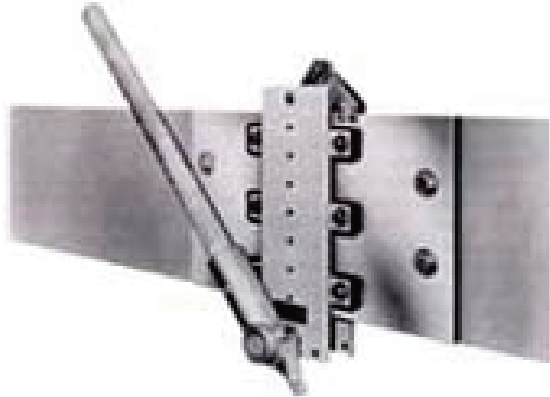
Filnor is a switch supplier to a number of different industries such as transportation, utility, telecommunications, and heavy industry just to name a few. Our industry coverage lies from the large steel producers to the small marine diving companies.

With our many years of experience building standard and special switch units, Filnor is highly capable of fulfilling your switch needs.



# DB HIGH CURRENT SWITCHES

## TYPE DB HIGH CURRENT SWITCHES



Open knife switches are used as disconnect switches mounted on switchboards, distribution and control panel boards. Extensive use of knife switches are found in the heavy industries and laboratories, for control and test panels, where visible disconnects are required.

Type A, single-throw, not-fusible knife switches have a corrosion resistant finish, are mounted on GPO-3 bases and have high clips and hinges. The high clips and hinges simplify the front-of-board connections.

### SINGLE-POLE SINGLE-THROW MANUALLY OPERATED SWITCHES

Normal Ampere Rating	LOAD SWITCHING		NON - LOAD SWITCHING	
	6 Volts DC maximum	250 Volts DC maximum	1000 Volts DC maximum	1000 Volts 60 Hz AC maximum
	Type	Type	Type	Type
3000	DB11031H	DB12031H	DB13031H	DB15031H
4000	DB11041H	DB12041H	DB13041H	DB15041H
5000	DB11051H	DB12051H	DB13051H	DB15051H
6000	DB11061H	DB12061H	DB13061H	DB15061H
7000	DB11071H	DB12071H	DB13071H	DB15071H
8000	DB11081H	DB12081H	DB13081H	DB15081H
9000	DB11091H	DB12091H	DB13091H	DB15091H

### SINGLE-POLE SINGLE-THROW PNEUMATICALLY OPERATED SWITCHES

Normal Ampere Rating	Number of Units	LOAD SWITCHING		NON - LOAD SWITCHING	
		6 Volts DC maximum	250 Volts DC maximum	1000 Volts DC maximum	1000 Volts DC maximum
		Type	Type	Type	Type
10,000	2	DB11102P	DB12102P	DB13102P	DB15102P
12,000		DB11122P	DB12122P	DB13122P	DB15122P
14,000		DB11142P	DB12142P	DB13142P	DB15142P
16,000		DB11162P	DB12162P	DB13162P	DB15162P
18,000	3	DB11182P	DB12182P	DB13182P	DB15182P
20,000		DB11203P	DB12203P	DB13203P	DB15203P
24,000		DB11243P	DB12243P	DB13243P	DB15243P
28,000	4	DB11284P	DB12284P	DB13284P	DB15284P
30,000		DB11384P	DB12304P	DB13304P	DB15304P
38,000		DB11364P	DB12364P	DB13364P	DB15364P

- Rating are conservative values for continuous duty service. If switch is to be subjected to intermittent service or unusual ambient conditions, it is recommended that full details be forwarded to the factory for analysis.
- Complete the type number by adding the appropriate air cylinder mounting letter E or F, as described on page 3.
- Can be used for load switching when in parallel with an electrolytic cell (cell shorting), where the voltage drop across the cell is not more than 6 volts DC.
- Refer to page 2 for modifications and special features.

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# DB HIGH CURRENT SWITCHES

## TYPE DB HIGH CURRENT SWITCHES



Bus Disconnect Switch  
15,000 Amperes, 250 Volts DC  
Pneumatically Operated

Combinations of the basic modular units, shown on page 1, are available in Amperes ratings from 10,000 to 36,000 Amperes and larger. The listings below are for the least number of units for the particular Ampere rating. Other combinations are available to meet various bus arrangements such as:

two 3,000 Ampere units for a 6,000 Ampere amplification

three 4,000 Ampere units for a 12,000 Ampere amplification

four 3,000 Ampere units for a 16,000 Amperes amplification

four 5,000 Ampere units for a 20,000 Ampere amplification

### MODIFICATIONS AND SPECIAL FEATURES

ITEM	FORM LETTER	DESCRIPTION
1	X1	<b>Auxiliary Switch for General Indication</b> - Provides 1-N.O. and 1-N.C. auxiliary contacts and indicates approximate position of the main switch moveable contacts. Typical use is pilot light indication.
2	X2	<b>Auxiliary Switch for Specific Indication</b> - Provides 1-N.O. and 1-N.C. auxiliary contacts and indicates a specific position of the main switch moveable contacts. Typical uses are interlocking or sequencing of auxiliary equipment such as pumps or fans. NOT to be used to initiate the electrical control circuit of the load switching device. eg. electrically operated circuit breaker or circuit interrupter.
3	K K1	<b>Key Interlock in Lock Open Position</b> - Provision for without lock. - With lock mounted, specify mounting sequence.

### Ordering and Quote Information Required

- |   |  |
|---|--|
| 1. Class, type number, and form letters (if any) of switch.   | 4. Voltage, ampere rating, and duty cycle of switch application.   |
| 2. For manually operated switches listed on page 1, complete the type number by replacing the symbol (*) with appropriate handle operation method letter A, B, C, or D as described on page 3.  | 5. Cross sectional dimensions of terminal bus, material of which it is made, whether installed edgewise or flatwise, space between bars of multi bus system and allowable temperature rise of bus. |
| 3. For pneumatically operated switches listed on page 3, complete the type number by replacing the symbol (+) with appropriate air cylinder mounting method letter E or F as described on page 3, and advise the available air pressure for the air cylinder. | 6. Ambient conditions of the application such as ventilated or non-ventilated area, high humidity, ambient temperature at switch location, corrosive atmosphere, etc.                              |

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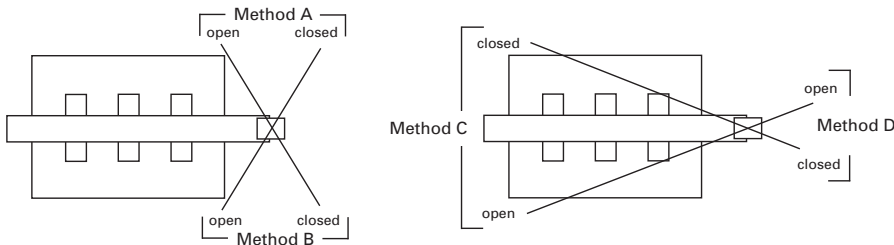
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# DB HIGH CURRENT SWITCHES

## TYPE DB HIGH CURRENT SWITCHES

### Manual Operated

The manual operated consists of a cast indicating plate with stops, indicating OPEN and CLOSED, and a cast hub that has a socket for the wood handle. The hub has a pull to turn latch at both positions. The four methods of furnishing the manual operated are shown below.



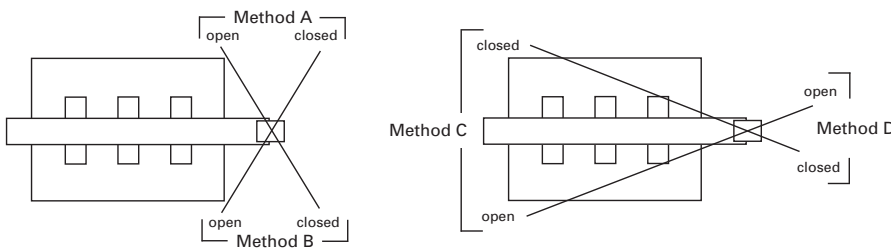
Note: The cover, indicating plate, and handle hub are at bus potential when switch is closed. The handle length varies to provide approximately 40 pounds operating effort.



Manual Operator

### Pneumatic Operated

Some applications of DB switches require their use in the normally open position, others in the normally closed position. With pneumatically operated, the air cylinders are continually subjected to air pressure to avoid drifting of the switch. Air cylinders are mounted as shown in the two configurations below. ie. with the piston rods retracted into the cylinders for the position, open or closed, that is normal for the switch. This is done to minimize dirt collection and corrosion of the piston rod.



Air cylinders are sized to provide a safety factor with the recommended or specified pressure rating. Dry lubricated instrument air is recommended.

For typical DC applications the switch cover plate, air cylinder mounting, air cylinder and linkage are at bus potential when the switch is closed. Flexible insulated air lines are required. If solenoid operated valves are used, the conduit must be insulated and flexible.



Pneumatic Operator

Ampere ratings of the switches listed on pages 1 and 2 are based on 1 pair of moving contacts per 1000 amperes. The temperature rise of the switch depends on the bus temperature since they will equalize and the switch cannot run cooler than the bus. On intermittent duty, it may be possible to use a smaller rated switch depending on the open and close intervals, bus temperature and ambient conditions.

# DB HIGH CURRENT SWITCHES

## TYPE DB HIGH CURRENT SWITCHES

### Auxiliary Switches

There are two basic used for auxiliary switches depending upon the application. They are as follows:

**General Indication.** Indicated approximate position of main switch contacts, within 30° of travel, eg. when the auxiliary contacts are closed with the main contacts closed, the auxiliary contacts will open within 30° of the opening stroke of the main switch. When the auxiliary contacts are closed with the main contacts open, the auxiliary contacts will open within 30° of the closing stroke. Typical use is pilot light indication.

**Specific Indication.** Indicates exact position of main switch contacts, open or closed, within 30° of travel, eg. when the auxiliary contacts are closed with the main contacts closed, the auxiliary contacts will open before the main switch contacts separate on the opening stroke. When the auxiliary contacts are closed with the main contacts open, the auxiliary contacts will open as the main switch contacts just start to move towards the closed position. Besides the fully open and closed positions, auxiliary switches can be located at various points along the arc of travel of the main moveable contacts.

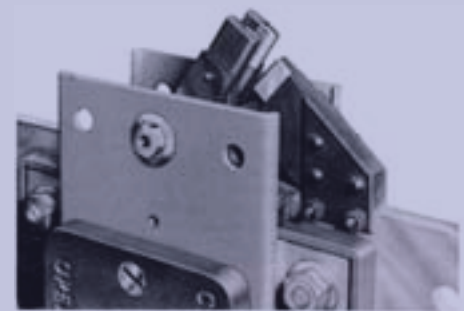
Typical uses are interlocking or sequencing of auxiliary equipment such as pumps or fans. Not to be used to initiate the electrical control circuit of the load switching device. eg. electronically operated circuit breaker or circuit interrupter.

### Load Switching Arc Contacts

Load switching arc contacts as supplied on the 6 Volt DC switch consist of one stationary and two moving arc contacts all having tungsten alloy arc tips. They provide initial contact before the main contacts on closing and break contact after the main switch contacts on opening. They are of rugged construction, factory adjusted, and are easily replaced.



Auxiliary Switch



Arcing Contacts

# DB HIGH CURRENT SWITCHES

## TYPE DB HIGH CURRENT SWITCHES

### Modular Construction

Basic switch modules are available in nominal ratings of 3000 to 9000 amperes, in 1000 ampere increments. Higher ampere ratings are obtained by combining two or more modules into one assembly. Modules can be factory assembled to provide single-pole, double-throw as well as multiple-pole devices. Configurations can be developed to match special bus structures.

### Contacts

Contacts of Type DB switches are double break with a wiping action that is self cleaning. The double rows of contact bars, one above and one below the terminals, are self aligning. Each contact bar has its own stainless steel pressure spring which assures proper contact pressure under the most adverse operating conditions. Parallel construction of the moveable contacts provides magnetic forces which supplement the contact pressure of the stainless steel springs.

### Terminals

Terminals are silver plated copper bars with slotted holes to make field alignment of multiple switches a simple matter. The end of each terminal which connects with the main moveable contacts is beveled to make the switch close easily. They are silver plated for greater contact efficiency and protection against corrosion.

### Cover Plate

Copper plate for DC switches are constructed of sturdy steel with protective coatings to withstand the corrosive environments frequently encountered in this type of switch application.

Cover plated of DC switches are made of glass polyester to avoid eddy current losses and to provide additional insulation for the higher voltages which are common to AC installations.

### Type DB

Type DB High Current Switches were developed to provide a reliable, uncomplicated and economical means of switching circuits which carry large AC or DC currents. Typical applications are as non load-break disconnects for electric furnaces, rectifiers, metal plating apparatus, and large DC motors. Also used as load-break absorbing switches for electro-chemical industry cells and smaller installations which demand high current capacity, and dependable performance under adverse conditions.

### Driver Mechanism

The driver mechanism is arranged so that the switch cannot be damaged due to overtravel. In the closed position, there is no tendency of the contact springs to bias the contacts towards the open position because spring action of the contacts is not in the same plane as the motion of the driver mechanism.

Adjustment of the mechanism is not critical. Insulation wit as much as plus or minus 10° from dead center closed position can

be tolerated without reducing contact area or contact pressure.

### Easy Maintenance

Husky bolts clamp the terminals between the copper plate and insulators. All other principle parts are positioned and held in place by this unique construction of the switch.

If maintenance is required, Type DB switches can easily be reassembled without special jigs or tools. The telescoping insulators, together with the cover plates, automatically align the terminals without the gouging or adjustment of parts.



# DB HIGH CURRENT SWITCHES

## TYPE DB HIGH CURRENT SWITCHES

### Switch Applications

The Type DB (double break) switches were originally designed for cell shorting switches in the chloralkali industry, where any number of units could be gang operated with an air cylinder. For any cell shorting switch applications, furnish complete specifications and bus arrangement to the factory for quotation.

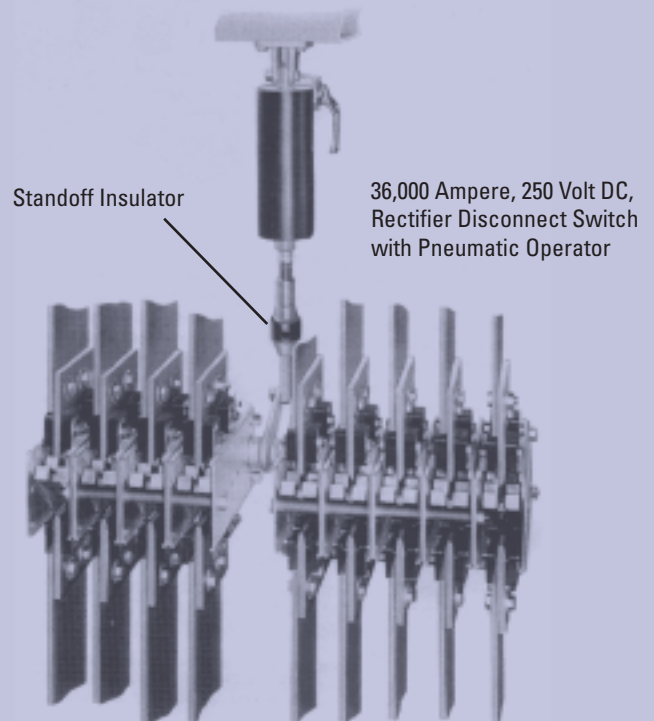
Some of the earliest and most extensive applications of Type DB switches are as cell shorting switches for the chemical industry. An example is in chlorine manufacturing, where dependable operation is a necessity and highly corrosive atmospheres exist.

The reciprocating tubular pushrod operator used to actuate multiple modular unit, provides simultaneous action of all units since there is no deflection in this type of linkage. This construction also makes installation or removal of a module quite easy. Only terminal bolts and one crank bolt need to be removed to free the module from a multiple module unit.



140,000 Ampere, 4.5 Volt DC, Cell Shorting Switch designed for the Chloralkali industry

Another application of the Type DB switch is its use as a rectifier switch. This switch in the illustration to the right, is pneumatically operated. note the standoff insulator which is used to isolate the air cylinder from switch potential.

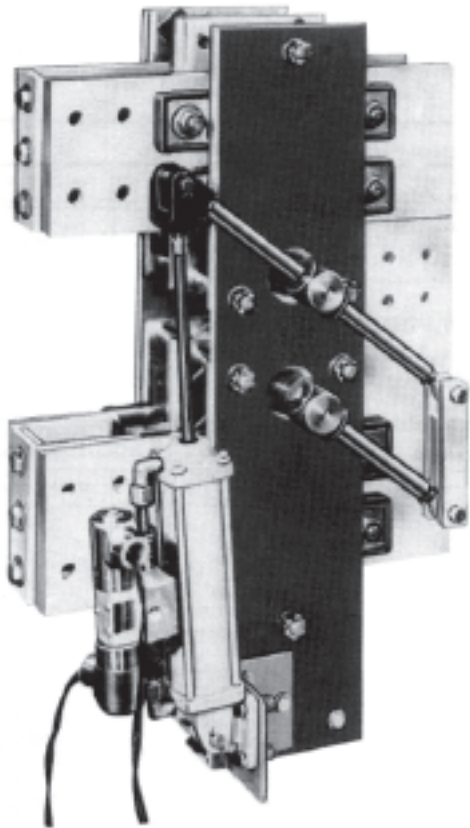




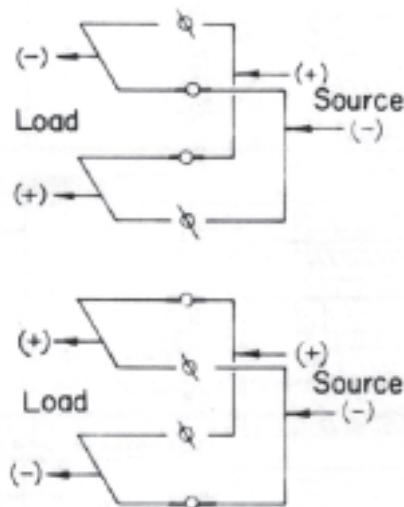
# DB HIGH CURRENT SWITCHES

## TYPE DB HIGH CURRENT SWITCHES

The Type DB switches are also used for polarity reversing applications. Four Type DB switch units, factory assembled and bussed together, as shown here, make up a polarity reversing switch. The diagram below shows the paths of current travel with the switch in its two positions.



3000 Amperes, 5 Volt DC, Polarity Reversing Switch with Pneumatic Operator



### High Current Disconnect Applications

Steel mills, foundering, and other similar industries find high voltage AC versions of the Type DB switch well suited to electric furnace applications. When power supplies to a furnace must be transferred from one source to another, or for isolation of an electric furnace for maintenance, the Type DB switch answers the need perfectly.



2000 A, 1000 V, 2-Pole, Single Throw, Type BM

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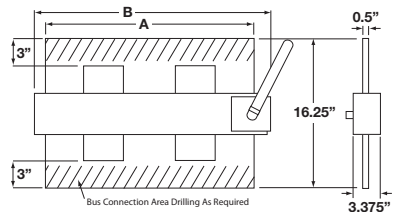
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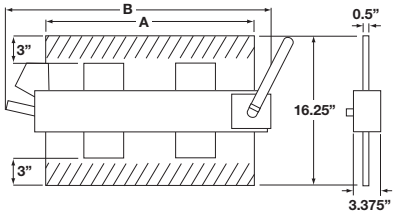
# DB HIGH CURRENT SWITCHES

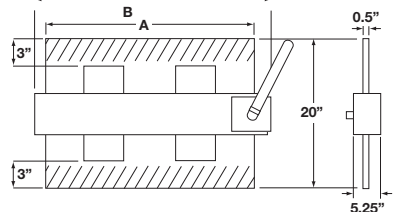
## APPROXIMATE DIMENSIONS

NOT FOR CONSTRUCTION UNLESS ENDORSED

### TYPE DB MANUALLY OPERATED, SINGLE-POLE, SINGLE-THROW SWITCHES

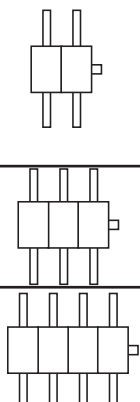
250 VOLT DC & UNDER, NON-LOAD SWITCHING				
	AMP	A	B	WEIGHT LBS
	3,000	6	11	70
	4,000	8	13	85
	5,000	10	15	105
	6,000	12	17	120
	7,000	14	19	140
	8,000	16	21	155
	9,000	18	23	175

6 VOLT DC & UNDER, LOAD SWITCHING				
	AMP	A	B	WEIGHT LBS
	3,000	6	13	80
	4,000	8	15	95
	5,000	10	17	115
	6,000	12	19	130
	7,000	14	21	150
	8,000	16	23	165
	9,000	18	25	185

1000 VOLT DC, NON-LOAD SWITCHING				
	AMP	A	B	WEIGHT LBS
	3,000	8	13	90
	4,000	10	15	105
	5,000	12	17	125
	6,000	14	19	145
	7,000	16	21	165
	8,000	19	24	185
	9,000	21	26	210

NOTE: Switches furnished with arcing contacts can be mounted in any plane except with arcing contacts at bottom.

### TYPE DB PNEUMATICALLY OPERATED, SINGLE-POLE, SINGLE-THROW SWITCHES

MULTIPLE UNITS FOR 10,000 AMPERE & OVER, 250 VOLT DC, NON-LOAD SWITCHING			
	AMP	NO. UNITS	WEIGHT LBS
	10,000	2 - 5000 A	225
	12,000	2 - 6000 A	255
	14,000	2 - 7000 A	295
	16,000	2 - 8000 A	325
	18,000	2 - 9000 A	365
	20,000	3 - 7000 A	440
	24,000	3 - 8000 A	485
	28,000	4 - 7000 A	580
	30,000	4 - 8000 A	640
	36,000	4 - 9000 A	720

NOTE: Contact the factory for dimensions of 250 Volt DC and 1,000 Volt DC pneumatically operated switches.

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# DB HIGH CURRENT SWITCHES

## TYPE DB HIGH CURRENT SWITCHES

### Ordering Information Required On all class 9860 Type DB Switches

**1. Application**

**2. Amperes**

**3. Voltage** AC \_\_\_\_\_ DC \_\_\_\_\_

**4. Temperature Rise**

**5. Bus Size**

**6. Load Break or Non-Load Break (circle one)**

**NOTE: Must be non-load break over 10 volts DC and all AC must be non-load break**

**7. Operator**

[A] Manual Handle Position

Method A \_\_\_\_\_

B \_\_\_\_\_

C \_\_\_\_\_

[B] Pneumatic  
Air Pressure

Method [ ] E or [ ] F  
Max PSI \_\_\_\_\_

Min PSI \_\_\_\_\_

Control Required  
If yes, specify.

{ } Yes [ ] No (check one)

**8. Installation (must be indoors)**

**9. Auxiliary Switches (check one)**

[ ] General Indication Form X1

[ ] Specific Indication Form X2

**10. Key Interlock**

Provision for \_\_\_\_\_

Mounted \_\_\_\_\_

If mounted, specify mounting sequence, end user, coordinating lock, P.O. number.

**11. Special Handle Extension**

**12. Special Mounting Information**

**13. Special Application Information**

Atmosphere, ambient conditions, duty cycle, etc.