



Selecting switches per NEC & IEC

Selecting switches per NEC

Article 430 of the US National Electric Code includes two methods for properly sizing disconnect switches:

1. Single motor application

A properly sized disconnect switch for a single motor will:

- have an ampere rating greater than or equal to 115 percent of the rated motor full load current; or,
- have a HP rating greater than or equal to the rated motor HP (at applied voltage) if the disconnect switch under consideration is HP rated.

2. Combination load application

A properly sized disconnect switch for a combination load will be selected by adding all the simultaneous individual loads in the circuit under consideration.

Using motor nameplate information, load information, and tables from section 430 of the NEC, determine one equivalent full load current and one equivalent locked rotor current. The equivalent locked rotor current can be used with table 430-151 to determine an equivalent HP rating. Select a disconnect switch:

- greater than or equal to 115 percent of the equivalent full load current; and,
- greater than or equal to the equivalent HP rating.

Selecting switches per IEC

Utilization categories

Nature of current	Utilization category		Typical applications
	Frequent operation	Infrequent operation	
Alternating current	AC-20A	AC-20B	<ul style="list-style-type: none"> Connecting and disconnecting under no-load conditions Switching of resistive loads including moderate overloads (PF > 0.95) Switching of mixed resistive and inductive loads, including moderate overloads (PF > 0.65) Switching of motor loads or other highly inductive loads (PF > 0.45 below 100A; PF > 0.35 above 100A)
	AC-21A	AC-21B	
	AC-22A	AC-22B	
	AC-23A	AC-23B	
Direct current	DC-20A	DC-20B	<ul style="list-style-type: none"> Connecting and disconnecting under no-load conditions Switching of resistive loads including moderate overloads (L/R < 1ms) Switching of mixed resistive and inductive loads, including moderate overloads e.g., shunt motors (L/R < 2.5ms) Switching of highly inductive loads e.g., series motors (L/R < 15ms)
	DC-21A	DC-21B	
	DC-22A	DC-22B	
	DC-23A	DC-23B	
Mechanical endurance	Number of operations	Number of operations	
100A	10,000	2000	
315A	8000	1600	
>315A	2000	400	

- Category AC-23 includes occasional switching of individual motors. The switching of capacitors of tungsten filament lamps shall be subject to agreement between manufacturer and user.