

Door Security + Safety

DHI'S PUBLICATION FOR DOOR SECURITY + SAFETY PROFESSIONALS

APRIL 2022



Door and Hardware Trends in the Evolving Health Care Market

INSIDE:

- + THE DOOR TO IMPROVING HEALTH CARE OUTCOMES
- + HARDWARE TO THE RESCUE
- + THE TRIED AND TRUE INTERCOM
- + CASE STUDIES IN HEALTH CARE ACCESS CONTROL



BASIC REQUIREMENTS FOR ELECTRIFIED SYSTEMS



BRIAN C. CLARKE, AHC/EHC, DHT, DHC, CFDAI, CDT, CSI, is Director of Architectural Specifications, Hager Companies. Email: bclarke@hagerco.com.

ELECTRIFIED DOOR HARDWARE SYSTEMS ARE INCREASINGLY POPULAR COMPONENTS OF DOOR INSTALLATIONS. THERE ARE CERTAIN BASIC REQUIREMENTS FOR INSTALLING THESE SYSTEMS AND SEVERAL ASSETS NEEDED.

The four basic components required to create a complete electrified circuit include:

- Power Supply
- Switch
- Load
- Conductor

Most electrified door hardware operates on low voltage—either 12VDC (volts direct current) or 24VDC. Although in buildings the most common power provided to outlets is 120VAC (volts alternating current).



An electrified door hardware system power supply.

POWER SUPPLIES

The power supply takes the 120VAC building voltage and transforms it down to either 12VAC or 24VAC and then rectifies it to 12VDC or 24VDC. It must furnish the same voltage (12 or 24) as required by the load it will be powering. The current (amps) available from the power supply must be greater than that required by the total load of the system. It is recommended to have 50% more amperage (amp) than what is required by the total load requirement.

Here is an example:

2 ea electrified locks that use .333amp each + 2 ea card readers that use .5amp each = 1.666amps total.

The power supply would need to be at least two amps. Most power supplies are provided in increments of an amp:

1amp, 2amps, 3amps, etc.

SWITCHES

A switch is an electric component that can make or break an electrical circuit. It can interrupt the current or divert it from one conductor to another. It is used to control a locking device or to signal a monitoring device.

There are multiple types of switches.

NORMALLY CLOSED (NC) SWITCH

This NC switch (A) allows power to the load through its normal state. In practice, for example, this would be used in a “push to exit” button—if you push the button it will open the circuit and stop the flow of electricity to the load. Imagine a remote push button located at the reception desk unlocking the lock (a fail safe product).

NORMALLY OPEN (NO) SWITCH

In this NO switch (B), the electrical connection is open, not allowing power to the load. In practice, for example, this would be used with a doorbell—when the button is pressed, the circuit becomes complete and the doorbell rings.

MAINTAINED SWITCH

When the state is changed, it remains in that state until it is changed again. A light switch is an example.

MOMENTARY SWITCH

When the state is changed, it will automatically return to its original position. A doorbell is an example.

In this issue of *Door Security + Safety*, we bring back the popular “Tech Tips” department that appeared in this magazine in recent years. Each article highlights useful technology tips for door installation and service. If you have an idea for a Tech Tips article you want to submit, contact *Door Security + Safety* Editor Al Rickard, CAE, at arickard@dhi.org.



C COMMON WIRE GAUGES USED IN DOOR HARDWARE

Total Amps	Voltage	12 Gauge	14 Gauge	16 Gauge	18 Gauge	20 Gauge	22 Gauge
0.25 A	12V 24V	1500 ft 3000 ft	1000 ft 2000 ft	600 ft 1200 ft	375 ft 750 ft	225 ft 450 ft	
0.5 A	12V 24V	750 ft 1500 ft	500 ft 1000 ft	300 ft 600 ft	190 ft 375 ft	110 ft 225 ft	
0.75 A	12V 24V	500 ft 1000 ft	300 ft 600 ft	185 ft 375 ft	125 ft 250 ft	75 ft 150 ft	
1.0 A	12V 24V	400 ft 800 ft	250 ft 500 ft	150 ft 300 ft	100 ft 200 ft	50 ft 100 ft	
1.25 A	12V 24V	300 ft 600 ft	190 ft 380 ft	120 ft 240 ft	75 ft 150 ft	45 ft 90 ft	
1.5 A	12V 24V	250 ft 500 ft	150 ft 300 ft	100 ft 200 ft	65 ft 125 ft	40 ft 80 ft	
1.75 A	12V 24V	230 ft 460 ft	135 ft 275 ft	85 ft 170 ft	50 ft 100 ft	35 ft 70 ft	
2.0 A	12V 24V	200 ft 400 ft	120 ft 240 ft	75 ft 150 ft	45 ft 90 ft	30 ft 60 ft	
2.25 A	12V 24V	175 ft 350 ft	200 ft 400 ft	65 ft 130 ft	40 ft 80 ft	25 ft 50 ft	
2.5 A	12V 24V	150 ft 300 ft	95 ft 190 ft	60 ft 120 ft	35 ft 75 ft		
2.75 A	12V 24V	140 ft 280 ft	85 ft 170 ft	50 ft 100 ft			
3.0 A	12V 24V	130 ft 260 ft	80 ft 160 ft	50 ft 100 ft			

LOAD

A load is any part of a system that consumes power. Most locking loads have two options: fail safe and fail secure.

- Fail Safe: If power is lost to the lock, exit device trim, electromagnetic lock or strike, the system will be unlocked.
- Fail Secure: If power is lost to the lock, exit device trim or strike, the system will be locked.

CONDUCTORS

Conductors are needed to transmit 12VDC or 24VDC from the power supply to the load. These are usually metal wires encased in a protective coating.

Wire thickness is measured in gauge size. Common gauges used in door hardware are between 12 and 30 gauge. The smaller the gauge number, the thicker the wire. (C)

Distances electricity can travel depend on the gauge of the wire, as shown in the typical wire chart to the right.

Figure D is a simple diagram of four components in a complete circuit.

I hope this primer on electrified door hardware systems is a useful reference for installing and servicing these components. +

