THE PULS
ADVANTAGE

NEC CLASS 2 POWER SOLUTIONS

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NEC Class 2 Power Solutions
What Is The Difference From Standard Supplies?

The National Electrical Code (NEC) is the North American guideline for all electrical installations. NEC Article 725 is titled Class 1, Class 2, and Class 3 Remote-Control, Signaling and Power-Limited Circuits. In this issue, we will primarily focus on power limited Class 2 circuits and power sources. It is important to understand that NEC Class 2 is not to be confused with Class I, Division 2 - Electrical Equipment for Hazardous Locations.

Class 2 Circuit

A Class 2 circuit is the portion of the wiring system between the load side of a Class 2 power source and the connected equipment. Due to its power limitations, a Class 2 circuit considers safety from a fire initiation standpoint and provides acceptable protection from electric shock.

For reference, a Class 3 circuit is similar to a Class 2 circuit but is connected to a Class 3 source and considers safety from a fire initiation standpoint only. Additional protection is required to prevent electric shock.
A Class 1 circuit is connected to a power limited source but offers no protection from fire or electric shock.
A Class 2 circuit offers the highest degree of protection. A Class 2 circuit is limited either “Inherently”, where no overcurrent protection is required, or “Non-Inherently”, where overcurrent protection is required.

The maximum circuit voltage for a Class 2 Inherently Limited Power Source is 150 V and 60 V for a Non-Inherently Limited Power Source. A Class 2 circuit can be either AC or DC. All PULS Class 2 Supplies are inherently protected. A good example of a Class 2 circuit that everyone can understand is the doorbell at your home. The doorbell transformer (Class 2 Source) has the input wiring inside an approved UL enclosure, but the output terminals are exposed where an individual can reach up and touch. Even if a person was touching the terminals, the power source will not deliver enough energy to cause an electric shock under any circumstances. The doorbell wires are routed along joist and studs and at some point they enter the wall on the way up to the chimes where they can make physical contact with "Kraft" back insulation. If a nail or a screw is accidentally driven through the wires and creates a short, the doorbell transformer will not deliver enough energy to cause the wires to heat up where it catches the paper-lined insulation on fire. Although this is an example of an AC Class 2 application, the same principle applies when using a PULS NEC Class 2 power supply. Class 2 circuits are intended for dry indoor locations.

Class 2 Wiring Methods

A Class 2 circuit is characterized by its usage and power limitations and differs from light and power circuits which are covered by chapters 1 through 4 of the National Electrical Code. The differences deal with wire size, de-rating factors, overcurrent protection, insulation requirements, wiring methods and materials. In a Class 2 application, wiring can be exposed and does not need to be routed through conduit or other raceways. Typically, smaller wires can be used. However, special rated wires are required when installed in specific locations which are flame resistant and help prevent the spread of fire. Two or more Class 2 circuits are allowed in the same enclosure or raceway. However, Class 2 wiring must be separated from power and lighting and Class 1 circuit conductors. Circuits that do not meet Class 2 or Class 3 are often classified as a Class 1 Circuit.

Class 2 Power Source

Chapter 9, Table 11B, defines the power limitations of a Class 2 source. If a 24 VDC power supply (the most commonly used Class 2 voltage) is chosen for an application, then the maximum power allowed is 100 W. After a small start up window, the 100 W can not be exceeded under any circumstances including overload, short circuit or internal failure of the supply. If a power supply is used as the Class 2 power source, then the power supply must be a Listed Class 2 power supply (UL 508) and the power supply must be clearly marked as a Class 2 Power Source. The NEC Article 725 is the guideline for Class 2, but UL 1310 is the test standard for Class 2 units. This standard covers direct plug-in and cord-connected Class 2 units. UL 1310 sets power levels according to the NEC. Many industrial grade DIN rail mount power supplies may be tested to the UL 1310 standard; however, these power supplies are not covered by the standard. One advantage of using a Class 2 power supply is that if you have any devices that are not UL Approved and these devices are connected to a Class 2 source, UL typically does not require additional testing.

PULS has one of the largest selections of NEC Class 2 power supplies and other DC power solutions. No matter what the output voltage or your application, PULS can provide a supply that meets your requirements.

Download our **Product Selection Guide** or visit our website to review our comprehensive product portfolio.

Typical Applications & Use Cases

There are countless applications where Class 2 power supplies are required; industrial automation and process control applications; low-power digital devices; closed circuit TV systems; access control devices; alarm and surveillance camera systems; HVAC sensors, controllers and actuators; building automation controls and alarms; and smart building devices.

Industrial Automation & Process Control Applications

Closed Circuit TV Systems

Access Control Devices

Smart Building Devices

HVAC Sensors, Controllers & Actuators

Alarm & Surveillance Camera Systems

Building Automation Controls & Alarms

Sampling of PULS Products with NEC Class 2

PIANO

PIM90.245-L1
1-Phase, 24 V, 3.75 A, 90 W

DIMENSION

CS3.241
1-Phase, 24 V, 3.3 A, 80 W

DIMENSION

CD5.241-L1
DC/DC Converter
24 V, 3.8 A, 92 W

MiniLine

ML900.200
3-Phase, 24 V, 3.8 A, 90 W

PISA-M

PISA-M-4CL2
Electronic Circuit Breaker
4 NEC Class 2 Output Channels
24V, 3.75 A, 90 W or
12 V, 4.85 A, 58 W

PISA-B

PISA-B-8CL2-B1
Electronic Circuit Breaker
8 NEC Class 2 Output Channels
24 V, 30 A

FIEPOS
FIELD POWER SUPPLY

FPS300.246-049-102
Field Mounted Power Supply
IO-Link & 3 NEC Class 2 Outputs
1-Phase, 24 V, 12 A, 300 W

Check out the PULS Advantage Technical Library: *https://www.pulspower.com/us/support/downloads/the-puls-advantage/*

PULS

With full in-house control from concept to shipment and significant North American inventory, PULS ensures reliable availability for many DC power supplies and DC backup power solutions. Our product portfolio includes FIEPOS IP65/67 field mounted power supplies, DIMENSION, PIANO and MiniLine Series IP20 power supplies, along with DC-UPS, buffer modules, redundancy modules and PISA-B and PISA-M electronic circuit protection modules.

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