

## Application Note

# NT Series Toggle Switches Receive ISA 12.12.01 Electrical Approval for Class I and Class II Hazardous Material Refrigerants

### Background

Globally there is an initiative for the reduction of chlorofluorocarbon (CFC) and hydrofluorocarbon (HFCs) refrigerants due to their classification as Global Warming Potential (GWP) and Ozone Depletion Potential (ODP) chemicals. Legislative actions and laws are being implemented globally, including the United States of America's Environmental Protection Agency (EPA) Significant New Alternatives Policy (SNAP) Program. The intent is to phase out GWP/ODP refrigerant chemicals from common use and move to environmentally friendly hydrocarbon refrigerants like CO<sub>2</sub>, propane and butane.

The use of hydrocarbons may create a potentially explosive environment. These chemicals fall under Class I and Class II hazardous material designation. As such, applications involving hydrocarbon based refrigerants require sealed sensing and control devices to minimize the risk of an explosion. ISA 12.12.01 is an ANSI/ISA standard that sets forth the requirements for electrical devices where Class I and II chemicals are used.

The construction of Honeywell's NT Series 1NT91-2 and 2NT91-2 toggle switches are suitable for industrial applications where hazardous environmental conditions are present, such as refrigeration equipment control systems. The Honeywell 1NT Series and 2NT Series offer environmental protection to ISA Standard 12.12.01 in conjunction with Underwriters Laboratory (UL) Test Standard UL1054. Honeywell is one of the first manufacturers of these switches to receive this approval.



### Approved Products

#### Honeywell NT Series Toggle Switch

- Quick Connect Spade Terminals
- UL L191 Electrical Rating
  - 15 A, 125, 250, 277 Vac; ½ HP, 125 Vac;
  - 1 HP, 250, 277 Vac; 5 A, 125 Vac “L”
- Sealed to NEMA 3, 3R, 4, 13 and IP67
- Operating Temperature -40 °C to 71 °C [-40 °F to 160 °F]



**1NT91-2**  
1 Pole, 2 Position



**2NT91-2**  
2 Pole, 2 Position

### Solution

Standalone refrigerators are found in many stores and businesses all over the globe. Standalone refrigeration devices are all-in-one self-contained units that encase the controls, electronics and storage area in a single enclosure. With their own closed loop refrigerant system, they operate as an individual unit. This portability and modularity makes them more cost effective for convenience stores, small grocery stores, fast food restaurants, and vending locations as they can be moved around easily. These locations and applications don't need large centralized refrigeration systems.

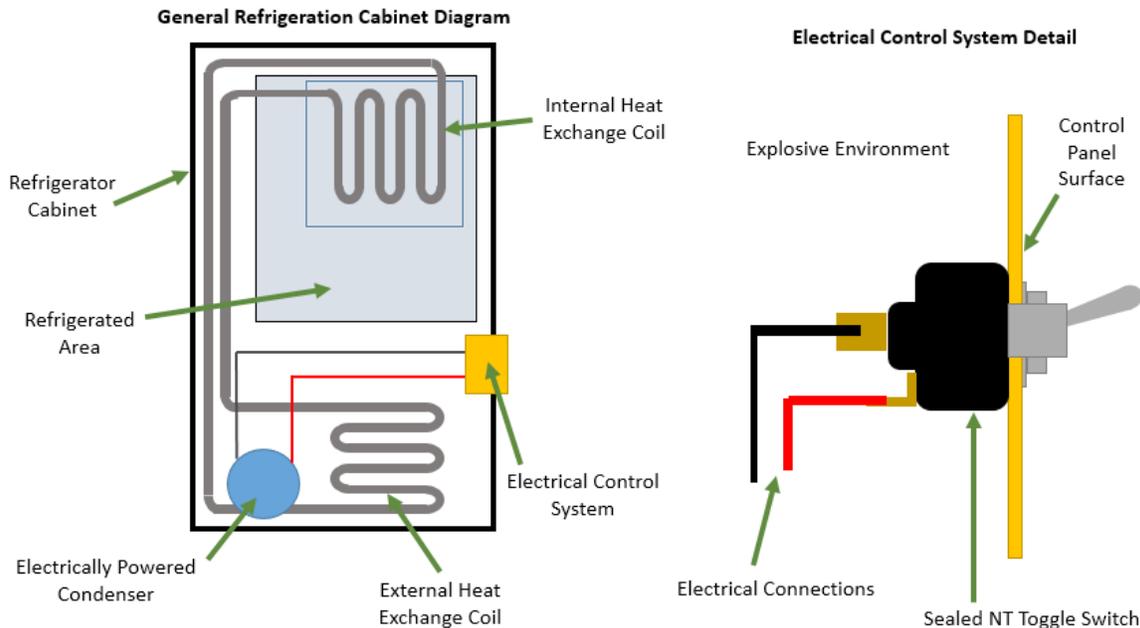
The devices must use a local control system because they are a standalone units. These systems control power, refrigeration levels and temperature and may even have connectivity to the internet or an intranet. One way to control power and other functions is to use mechanical switches, toggles and other products. Since the control systems are potentially close to flammable hydrocarbon refrigerant the switches and toggles must be certified to a standard, such as ISA 12.12.01. Honeywell's 1NT91-2 and 2NT91-2 toggles are certified ISA 12.12.01 and are designed to replace unsealed switches controlling the refrigeration motor.

The NT Series of switches come in a compact and panel-mount style package. This allows them to be easily mounted inside of control panels or in inconspicuous locations on refrigerators and other types of coolers.

## Features and Benefits

- Enables electrical system control in explosive environments as defined by ISA Standard 12.12.01 and UL Test Standard UL1054
- Step-design housing provides added space between terminals
- Single pole (1NT91-2), and double pole (2NT91-2) circuitry options provide flexibility for complex control systems
- Seals between the toggle lever and bushing, as well as between the cover and case allow the switch to be used in demanding applications
- Panel mount features, compact size and standard terminal sizes allow for easy integration as well as minimal installation time

## Block Diagram



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