

TR-406 TimeRITE Digital Defrost Controller w/Temperature and Pressure Functions NEMA1 - NEMA4 Enclosure

The TR-406 Digital Defrost & Temperature Controller is a "3 Function Controller". It provides calendar-based defrost schedules/cycles with unlimited duration and frequency selection, box temperature status & control w/coil temperature limit control and compressor pressure functions...Hi, Lo & Oil...(if selected during programming). It features a locking cover that can be converted easily from NEMA4 to NEMA1. It contains 3 hi-current Form C Relays to control Evap. Fan, Def. Heater and Compressor as well as a lo-current Form C Relay for temperature status/alarm. Light-Emitting Diodes (LEDs) indicate the controller status and operation. Operates at 120/240VAC.

Infinitely adjustable temperature & pressure set-points, anti-short cycle delay, differential points and unlimited defrost schedule capability are built-in and are programmable via PC, Smart-Phone or a Network link that is Bacnet compliant. Cooler or Freezer modes are selectable. Two temperature sensors are provided with the controller. Pressure transducers are optional. Retrofits easily.

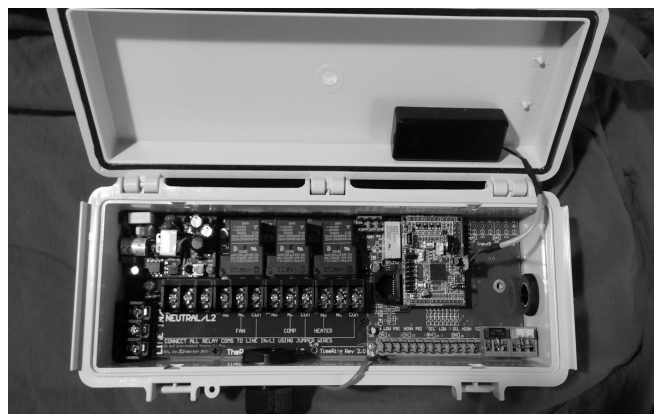
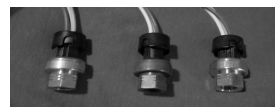


Figure 1: TR-406 Defrost/Temp/Pressure Control with NEMA 4/1 Enclosure (Temp. Sensors not shown)



**Figure 2: Pressure Sensors (Optional)
(M#100CP2-107 & 100CP2-108)**

Features and Benefits

Easy-to-Use PC or Smart-Phone interface program

Set-points (all types) and time/calendar schedules for defrost frequency, durations including holidays, etc. are all user programmable in minutes

Infinitely Variable Temperature Differential

Allows the user to set a precise (to 0.5F°) temperature differential across the entire temperature range

Adjustable Anti-Short Cycle Delay (0 to 20 Minutes in 1-Minute Increments)

Ensures that the system remains off for a user-set time delay, which helps avoid hard starts, nuisance overload outages, and unnecessary equipment wear

Jumper Selectable Temperature Application

Allows the user to choose "freezer" or "cooler" temperature ranges with a 'suit-case' jumper to ensure correct & accurate temperature control

Enclosure is UL rated high-impact, UV resistant plastic; NEMA1/NEMA4 rated (convertible)

Provides for surface mount indoor or outdoor applications

Universal Hi-Voltage & Current Design

Is 110-130/208-240 Volt capable and provides Hi Current (25A) relay direct-connection control for all commonly used HVAC/R components

Application

IMPORTANT: The **TR406 Controller** is intended to be used to both control equipment under normal operating conditions and to act as a limit or safety control as well, though it may be applied in either or both as needed.

The TR406 Digital Defrost & Temperature + Pressure Controller can be used on any freezer or cooler equipment that requires defrost operation. Typical applications would include but not be limited to:

- ⌚ Walk-In freezers and walk-in coolers
- ⌚ Reach-In freezers and coolers
- ⌚ Display-type freezers and coolers
- ⌚ Process freezers and/or coolers of any type
- ⌚ Any/All freezers and/or coolers requiring defrost

FCC Compliance

This device complies with Part 15 of the FCC Rules and operation is subject to the following conditions:

1. This device may not cause harmful interference;
2. This device must accept any interference that may cause undesired operation,

This device has been both laboratory and field tested and has been found to comply with the limits outlined for a Class A digital device pursuant to Part 15 of the FCC Rules. The designated limits as such designed to provide reasonable protection against harmful interference when and while this device is operated in a commercial/industrial environment. This device generates, uses and can/does generate radio frequency energy that if not installed and used in accordance with the instructions supplied, may cause harmful interference to radio communications. Residential application of this device may or may not cause or be likely to cause harmful interference, in which case the user will be required to correct the interference at their own expense and effort.

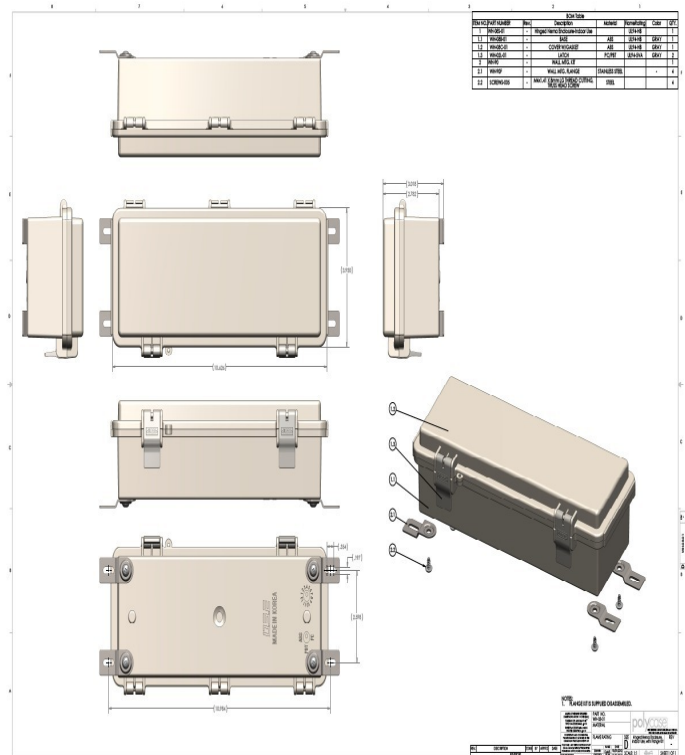
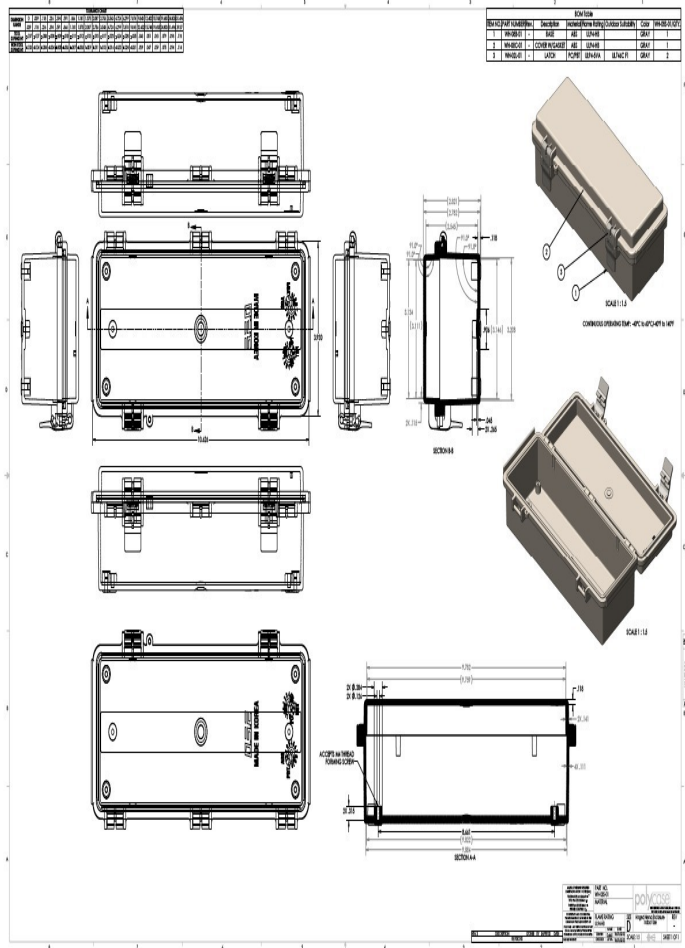
Canadian Compliance

This digital device does not exceed the Class A Limits for radio noise emissions from digital apparatus as set forth in the Radio Interference Regulations of the Canadian Department of Communications.

Additional Compliance

No other agency compliance terms are met or intended to be met by this device at this time.

Dimensions



Operation Overview

The TimeRITE TR-406 uses three connection interfaces for displaying to the user all of its set-points, status and to allow programming:

1. RJ45/CAT5 Direct-Connection
2. Permanent Network Connection RS485
3. Mini-USB Port Connection for 'Smart-Phone'

A “download-able” TimeRITE Software Program with instructions is available at:

theproductgroup.net/resources/downloads

Functional Description

The TimeRITE TR-406 primarily functions as a “Defrost Clock-Timer” as well as a freezer and/or cooler temperature controller. It will also function as a compressor system pressure controller (Lo, Hi, Oil) depending on the physical logistics of the installation application.

The controller contains 3 Form C 25A relays that are “channel specific” per connected load equipment:

- A. Compressor Control;
- B. Evaporator Fan Control;
- C. Defrost Heater Control;

The 2 temperature sensors that are inputs are also channel specific for “box ambient” temperature and evaporator “coil surface temperature.

Relays: Each relay (Compressor, Evaporator Coil & Defrost Heater) have LEDs adjacent them to indicate operation [ON/OFF].

Terminals: wiring connections are labeled for each relay and power connections as are the sensors... both pressure and temperature.

IMPORTANT: All wiring must conform to local, national, and regional regulations. Use copper conductors only for all wire connections. Do not exceed the electrical ratings for the for the equipment it is wired to.

Use wire no larger than 12 AWG when connecting to the high power terminal blocks

Temperature sensor signals may be affected by electrical interference. When extending sensor cable beyond 50 ft (15.2 m) use a twisted-pair, shielded cable to reduce electrical interference.

WARNING: Risk of Electrical Shock. To avoid the risk of electrical shock, disconnect all power sources to the control before wiring any connections. More than one disconnect may be required to completely de-energize the control and equipment.



Figure 3: TR-406 with NEMA 4/1 Enclosure – Vertical Position

Mounting: High impact housing can be mounted in a vertical or horizontal position via 3 metal “ear tabs” that screw into the rear of the housing in predetermined locations with starter holes. These brackets then are affixed to the desired mounting surface using appropriate screw fasteners.

User Operated Buttons: There are 3 user-interface buttons located on the circuit board:

- Manual Over-ride Button
- Limit Re-set Button
- Processor Re-set Button

Computer Interface:

Software used to program, monitor and modify the TR-406 is PC-type (NOT Mac) and will operate on Windows XP (any version) or later.

Smart Phone Interface:

Android & Iphone Apps are available at:

theproductgroup.net/resources/downloads