

CONTROLTEC INSTALLATION GUIDE

Purpose

ControlTec's AS20z Anti-sweat system when applied to a store's freezers, coolers or walk-ins of any type will greatly reduce energy cost while maintaining appearance to properly operating displays. Display door and frame life will be extended by reducing operating time. Condensation on displays is unattractive to consumers and develops unsightly corrosion over time. This will ultimately lead to premature failure of equipment. The AS20z patented design stops condensation before it starts thus preventing the corrosion process.

The system is expandable to monitor, track and identify trends of Case operating conditions by recording internal case and external door and frame temperatures wirelessly. All data is stored through an online server. Minor adjustments can be made on line should equipment performance change. Performance can be monitored for regular maintenance evaluations. With this proactive approach to troubleshooting, maintenance problems can be detected before they become costly repairs or loss of sales or product.

The system can be further expanded to minimize or avoid catastrophic failures cost with automated alarming and emergency communication to assigned contact.

Pre-installation procedure will identify and document pre-existing conditions in the store and refrigerated cases. Items needing repair will be documented and submitted to store management for signoff. Proper mapping and labeling will simplify this process as well as facilitate future online calibration to maximize savings.

Installation completion procedure will confirm operation of anti-sweat controls and operating condition of refrigerated cases upon completion. Store management signoff is required and any store equipment damaged or not operating to spec is the store's liability and responsibility to repair.

Scope

This guide will specify what is recommended for proper installation and how to start. Each application is unique therefore installations will vary. ControlTec mechanical installation is simple with focus on proper placement of sensors and COMMz communication device to maximize performance. The Store requirements are based on aesthetics and local electrical codes. This guide will specify what is expected for a typical application not including local codes. Installation suggestions are given for a typical application with some variations noted. Instructions are given for inspecting and calibrating equipment being installed that can be done on line or on site.

Pre Installation

- **Before you start** – Make sure there is uninterrupted power in the store to the freezers. Ensure the frame and door heaters are always on. You may need to disable a “Clicks-On” device at the power panel if installed.
- **Labeling** – Start by labeling all cases being upgraded using our naming convention. The naming convention is simple with a common sense approach. A store has a Front wall, Left wall, Right wall and Back wall with Aisles and End caps in the center. All cases in an aisle will be named by the aisle. The set of doors nearest the front of the store is #1. The doors are noted as the right hand (R) or left hand (L) side of the aisle when viewed from the front of the store. Use a labeler that will produce clear (black on white) vinyl labels with adhesive backing. Place label on clean flat surface at top of case above where DP sensor is located. Document (name) and (last 5 digits of AS20z serial number) on Installation Form supplied.

Example: 8R1 is the first set of doors on the right hand side of aisle 8.

8L4 is the fourth set of doors on the left hand side of aisle 8

End cap are between aisles so when viewing from the front of the store we reference the aisle to the left. End caps at the front of the store are #1 and at the back of the store #2.

Example: 7EC1 is the End cap between aisle 6 & 7 toward the front of the store.

8EC2 is the End cap between aisle 7 & 8 toward the back of the store.

Walk in coolers and normal temp coolers can be located on any wall of the store. When facing any wall the first set of doors begins to the left. If there is refrigeration at the front of the store such as a Florist then stand in the store facing the front wall to determine door #1.

Example: RW1 is the first set of doors on the right wall toward the back of the store.

LW1 is the first set of doors on the left wall toward the front of the store.

BW6 is the sixth set of doors on the back wall. The fifth set is to the left

FW2 is second set of doors on the front wall of the store. The first set of doors is to the left.

NOTE- Adding description such as Dairy ,Deli, Bakery and Florist” is acceptable and useful in locating devices.

If there is a freezer section not located on walls or by aisle then when facing from the front of the store the first row is to the left and can be noted as F1, the next row F2, etc...

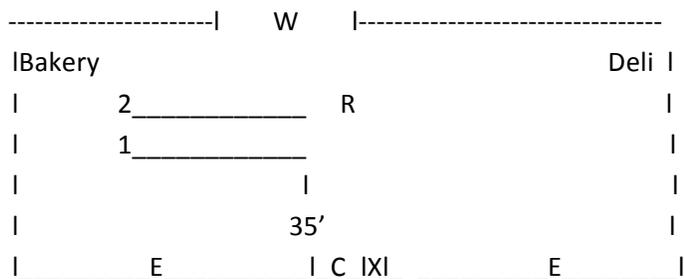
Example: F1R2 is the second set of doors on the right hand side in the first row of freezer section.

NOTE- Do not use the same name twice. Attempting to do so will produce an error message until corrected.

Do not use “-“ or “space” in location names . This will help with sorting by location later.

- **Mapping:** A simple map of the store will help in setting up wireless communication between Controllers, Repeaters and COMMz for maximizing signal strength. An example is provided below. On the back of this page draw your store following these guidelines. Begin by drawing the store outline. Write an “E” for identifying all public entry and exits on the box. The Office can be shown as a box with an “X” in it. Walk-ins can be shown as a box with a “W” in it. Bakery and Deli can be identified similarly. Refrigerated aisles can be shown as a single line oriented approximately to scale within your store map with the “aisle number” at the end of each line. The COMMz requires an internet connection usually located in an office, customer service center or cashier station. The COMMz should be located as close to AS20z controllers as possible and high on the wall to avoid customer traffic interference. Pace off nearest AS20z location and write the number of feet between COMMz and nearest AS20z ie: <-----35’----->. If the Ethernet port is too far away then a longer Ethernet cable may be required to get the COMMz closer to AS20z. A Repeater is used to improve the wireless network signal range and routing and should be placed near the middle of the refrigerated section and identified on map as “R”. Location may change depending on layout of store. Both the COMMz and Repeater have directional antenna built in. The top of the COMMz and Repeater housing should be pointed in the direction signal is to travel. The top is identified by the side with flashing lights. If the box is not mounted properly and simply set on a desk then the antenna direction would be pointed to the sky and the signal will not be as reliable.

• **Map Example:**



• **Inspect & Document**

Once cases are labeled and power has been on for approx 1 hour inspect each door and frame for operating condition. Record findings on spread sheet per instructions below. Examples are also shown.

- Document- Controller Name, ID, case content and number of doors per case.
- Document- low or no voltage to both door and frame.
- Document- number of Amps per door (Use an “Amp probe” on both door and frame wiring together to obtain value. This number can be re-used on “identical” makes and models with equal number of doors.
- Document- Document Case type as “F” for Freezer or “C” for Cooler. (Typical amp usage for freezer is 1.85 “min” and cooler 1.00)
- Document- Case and Door manufacturer
- Document- Case temperatures. (the coldest location will be near the refrigeration fan or in the rear)
- Inspect- every door for weak closers that will not close on their own from 2 inches open.
- Document- any door that will not close on their own. If any door with a sensor sticks open then it will freeze the sensor and heaters will stay on. This will result in significant energy loss and can be monitored online. If a door without a FT sensor is stuck open then it will frost up without online visibility and become a hazard. Tension closer hinge to achieve desired operation.
- Document- moisture on door glass and condensation on door frames. (Note: as controllers take over and limit heating this condition will worsen). Fix damaged door heater.
- Document- damaged or leaking seals. Leaks will result in energy loss, sweating and frost build up and wet floor liability.
- Document- “frame temperature” of frame where FT sensor will be mounted using an “Infra Red Thermometer”. The lower right hand corner of a case is usually the coldest spot and easiest for wire routing. A “max frame temp” can be obtained at the same location after heaters have run continuously for 1 hour. This reading is important in determining poor heater performance needing attention.
- Inspect- all other frame surfaces on the case for a lower temperature reading than where FT sensor will be located.
- Document- any surface colder than FT sensor location and note as “minimum temp”. If cold spot is from seal leak that cannot be repaired make sure it is documented. Accuracy of noted temperature deviation is critical at initial set as it is used for online calibration to maximize savings later. Blind adjustments can be made maximize savings without sweating only if initial information is accurate.
- Inspect- all surfaces between doors and frames for sweating or frost build up.
- Document- any sweating conditions no matter what the cause or if mentioned previously.
- Document- wireless signal strength between AS20z controller and COMMz. This can be done online after COMMz is installed and connected to a pre-designated Ethernet port. The sooner this connection is made the sooner ControlTec can assist with store setup and calibrating the controllers to the stores equipment conditions. Having someone on site while this is done further increases the accuracy of setup and future adjustments.

FYI

NOTE- if condensation is spotted where voltage is also detected the cause could be:

1) Worn and failing heaters or 2) Treated air from case leaking into kick plate area. Document any leaks from case into kick plate area and seal ASAP. Re-check temp if modifications are made. If there are no leaks then heating element may be faulty. If possible, remove the strike plate to record temperature of heating element. **Be careful-** heating element is very hot if working properly. Document temperature in installation notes if found to be insufficient.

NOTE- Controller does not control power to glass in doors. If door is sweating then check glass for voltage, etc..

NOTE- If an Amp Probe is not available then it may be possible to get Amp values from case frame. Freezers typically run 1.0-3.0 amps per door. Therefore a (5) door case @ rated at 4.95 amps is 1.0 amps per door. Typically there are two amp values noted on case labeling. One is for frame and the other for doors. The frame value would be divided by the number of doors and then added to door value for the correct individual door total.

NOTE- at the bottom of the door frame in the right hand corner there is a hole with a plastic cap used for optional door mount. This hole can be used for sensor routing.

NOTE- Typical Freezer case temps are: Ice cream (-11deg) frozen peas (-5deg).
Typical Coolers case temp is (35 deg min to 41deg max)

NOTE- Frame Heaters will vary and must be calibrated individually. Some heaters can only get so hot. Some heaters are slow in temperature rise. Frame heater performance can be affected by cases with very cold temperatures. They can also be affected by cases with treated air leaking into kick plate area.

INSTALLATION

Set up Account- Site Info- Account name, address and phone number.

Business contact name, phone, cell, email, pager

Technical contact name, phone, cell, email, pager

Refrigeration Company and contact name, phone, cell, email, pager

Set up Site- Site Info- Store name, address, phone number and cost of energy

Store manager, name, phone, cell, email, pager

Server alarm contact #1 name, phone, cell, email 1, email 2, pager

Server alarm contact #2 name, phone, cell, email 1, email 2, pager

Set up Network- Configuration: DHCP, Static IP,

IP address, Subnet and default Gateway, Port

Install FT sensor- Locate in the bottom right hand corner to the back of the frame. This is typically the coldest spot and also nearest to heating element. Clean surface. Place sensor to mark mounting hole location. Pre-drill 1/16" hole. Remove adhesive backing from sensor and seat flush to frame. Install mounting screw. Note- it is important to seat the sensor flush for best heat transfer and accurate readings. Location mentioned is also important to get best response time. Sensor wire can be routed through the 1" diameter optional door mounting hole covered with a plastic cap. If no hole exists then drill a 5/16 dia hole under the sensor housing near the end where the wire exits housing and route wire through hole.

Install DP sensor- Locate on the right hand side of the case. Loosen trim. Route the sensor wire underneath the trim. Do not Always avoid high voltage wiring and fluorescent lighting as their noise could disrupt sensor communication. Do not force wiring with tools as this may stress or break the wires internally.

Install CT sensor- route the sensor wire under the freezer and up the backside. Drill a 5/16 dia hole through back of case where treated air flows in. Slide sensor through hole and seal around internal and external surfaces with silicone.

Install AS20z controller- locate to the right side near by the FT sensor location. Connect AC wiring per schematic. Make sure both door and frame heater are being cycled-not just frame. Flashing yellow light indicates proper operation of controller. Green flashing light indicates communication with COMMz. Communication link cannot occur until the AS20z has been allowed to join the network via the online CaseManager software. Red light indicates heater are energized. Heaters will stay on if DP or FT sensors are damaged. Avoid high voltage areas or areas where moisture may concentrate. Bundle sensor wires away from other other electronics and wiring when possible. The AS20z housing is design to limit moisture penetration with a tight fit on sensor wiring. Do not pinch wire in housing or failure may occur.

Install COMMz- Locate Ethernet port designated by Store Technical contact. If location is too remote then an Ethernet cable may need to be installed to a location with a power source nearer to the AS20z locations. The COMMz should be mounted 6' or higher on a wall facing the AS20z and Repeater locations.

Install Repeater- Locate a power source near the center of the refrigerated section. This may vary depending on distance to COMMz and nearest AS20z. If walkins are or other controllers are spread out then Repeater location may need to change or additional Repeater added to pick up all controllers.