

Target Corporation Refrigeration Operational Standards ROG

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Operational Guidelines

Lighting Guidelines

Lighting Strategy

Expanded Lighting operational Standards can be found [here](#).

Pre-2009 Store Lighting Panel

SALES FLOOR LIGHTING CONTROLS			
THE SALES FLOOR LIGHTING IS MADE UP OF A MANUFACTURED WIRING SYSTEM AND CONTROLLED BY AN ENERGY MANAGEMENT SYSTEM. SALES FLOOR LIGHTING IS DIVIDED INTO FOUR(4) EQUALLY SPACED PROGRAMS TO ENSURE EVEN LAMP BURN AND AN EVEN ILLUMINATED SALES FLOOR THAT CAN BE CONTROLLED IN 25% INCREMENTS.			
TEST THE SALES FLOOR EMS CONTROLLED LIGHTING SYSTEM TO VERIFY THE ALTERNATING ZONES AND ENSURE THAT THE FOUR(4) ALTERNATING ZONE PATTERN IS MAINTAINED AS SHOWN ON THIS SHEET.			
ON POWER LOSS, EMS TURNS ON EMERGENCY LIGHTS.			
■ ■ ■ ■ *A*	■ ■ ■ ■ *B*	■ ■ ■ ■ *A*	■ ■ ■ ■ *B*
■ ■ ■ ■ *C*	■ ■ ■ ■ *D*	■ ■ ■ ■ *C*	■ ■ ■ ■ *D*
■ ■ ■ ■ *B*	■ ■ ■ ■ *A*	■ ■ ■ ■ *B*	■ ■ ■ ■ *A*
■ ■ ■ ■ *D*	■ ■ ■ ■ *C*	■ ■ ■ ■ *D*	■ ■ ■ ■ *C*
■ ■ ■ ■ *A*	■ ■ ■ ■ *B*	■ ■ ■ ■ *A*	■ ■ ■ ■ *B*
■ ■ ■ ■ *C*	■ ■ ■ ■ *D*	■ ■ ■ ■ *C*	■ ■ ■ ■ *D*
■ ■ ■ ■ *B*	■ ■ ■ ■ *A*	■ ■ ■ ■ *B*	■ ■ ■ ■ *A*
■ ■ ■ ■ *D*	■ ■ ■ ■ *C*	■ ■ ■ ■ *D*	■ ■ ■ ■ *C*
PROGRAM *A*: TYPE *A1*			
PROGRAM *B*: TYPE *A2*			
PROGRAM *C*: TYPE *A1*			
PROGRAM *D*: TYPE *A2*			
IF ON EMERGENCY CIRCUIT (SHADED SYMBOL) TYPE *A3*			

Post-2009 Store Lighting Panel

SALES FLOOR LIGHTING CONTROLS			
THE SALES FLOOR LIGHTING IS CONTROLLED BY AN ENERGY MANAGEMENT SYSTEM. SALES FLOOR LIGHTING IS DIVIDED INTO EIGHT(8) EQUALLY SPACED PROGRAMS TO ENSURE EVEN LAMP BURN AND AN EVEN ILLUMINATED SALES FLOOR THAT CAN BE CONTROLLED IN 1/8 INCREMENTS.			
TEST THE SALES FLOOR EMS CONTROLLED LIGHTING SYSTEM TO VERIFY THE ALTERNATING ZONES AND ENSURE THAT THE EIGHT(8) ALTERNATING ZONE PATTERN IS MAINTAINED AS SHOWN ON THIS SHEET.			
ON POWER LOSS, EMS TURNS ON EMERGENCY LIGHTS.			
■ ■ ■ ■ *A*	■ ■ ■ ■ *E*	■ ■ ■ ■ *A*	■ ■ ■ ■ *E*
■ ■ ■ ■ *C*	■ ■ ■ ■ *G*	■ ■ ■ ■ *C*	■ ■ ■ ■ *G*
■ ■ ■ ■ *B*	■ ■ ■ ■ *F*	■ ■ ■ ■ *B*	■ ■ ■ ■ *F*
■ ■ ■ ■ *D*	■ ■ ■ ■ *H*	■ ■ ■ ■ *D*	■ ■ ■ ■ *H*
■ ■ ■ ■ *A*	■ ■ ■ ■ *E*	■ ■ ■ ■ *A*	■ ■ ■ ■ *E*
■ ■ ■ ■ *C*	■ ■ ■ ■ *G*	■ ■ ■ ■ *C*	■ ■ ■ ■ *G*
■ ■ ■ ■ *B*	■ ■ ■ ■ *F*	■ ■ ■ ■ *B*	■ ■ ■ ■ *F*
■ ■ ■ ■ *D*	■ ■ ■ ■ *H*	■ ■ ■ ■ *D*	■ ■ ■ ■ *H*
PROGRAM *A-H*: TYPE *A1*			
IF ON EMERGENCY CIRCUIT (SHADED SYMBOL) TYPE *A2*			

All lighting systems at Target are on a set schedule. These schedules differ based on a store's stocking/flow schedule. Overrides allow stores to manually turn on a system for a given amount of time. Once the time has elapsed, overrides can be repeated. If an override is set to off, the system cannot be manually turned on at the store level.

Included in the 2009 Prototype lighting strategy are 8 different lighting programs that are referred to as A, B, C, D, E, F, G and H. This differs from the Pre-2009 A, B, C, D lighting programs. Each lighting program represents 1/8th of the store lighting on the sales floor. As shown in the picture above, the programs of lights alternate down the store aisles to ensure that all parts of the store are equally lit by each program. Only two sets of lights (A, B, C, D, E, F, G, or H) will be on when a store is operating on 25% lighting; four sets will be on for 50% lighting. The actual lights that stay lit on 25%, 50%, and 75% settings rotate among programs (A, B, C, D, E, F, G, H) to keep bulb exposure consistent.

Target prototypes from 2009 and newer are designed with a Powerlink electrical panel, which utilizes breakers within this panel to control the lights. The signal is sent from the EMS system to the breakers. However, a manual override can also be done at this breaker by someone at the store if necessary. This differs from the pre-2009 prototype which

utilizes contactors instead of breakers to control the lighting. Most MR/RS stores do not get Powerlink panels if they did not previously have them. However, if **both** electrical closets are getting updated during the remodel they will be upgraded with Powerlink at that time. .

RSM Lighting Schedules

All lighting systems at Target operate on a set time schedule based on a when the store flow team arrives to stock the store. Refer to tables below for information regarding when these units turn on and off. System schedules are based on the store's hours of operation and then adjusted for time overlaps (e.g. + 00:01 for plus one minute or -00:01 for minus one minute). Some stores have adjusted schedules due to state laws.

Different lighting settings (e.g. 100% and 25%) can overlap even though they involve the same light fixtures. The system was designed this way to prevent a complete blackout when switching from one light setting to the next. For example, at closing time, the 25% light setting is set to turn on at -1 minute or one minute before closing. The 100% lights are consequently set to turn off right at closing. This same concept is used at opening time.

Overrides allow stores to manually turn on a system for a given amount of time. Once the time has elapsed, overrides can be repeated. If an override is set to off, the system cannot be manually turned on at the store level. Case lighting is controlled through the Einstein panel, independently in the REMS system, or in conjunction with display lighting in the EMS system. *Any permanent changes to these schedules must be approved and will be noted on store graphics.*

Lighting and HVAC Overrides Schedule Link

For Target lighting/HVAC override review, please go [here](#).

HVAC Guidelines

Expanded HVAC Operational Standards can be found [here](#).

All HVAC systems operate on a set time **schedule** based on a when the store flow team arrives to stock. During this time frame, HVAC units at the store will reflect occupied set points (see HVAC set points table). Outside of this time frame, HVAC units will reflect unoccupied set points.

Overrides allow stores to manually turn on a system for a given amount of time. Once the time has elapsed, overrides can be repeated. If an override is set to off, the system cannot be manually turned on at the store level. *Any permanent changes to these schedules must be approved and will be noted on store graphics.*

Condensate Vacuum Systems

Target currently utilizes Vacuum Pumps at certain Target stores to remove condensate drainage from the refrigerated market cases. Engineering makes that determination based on the location of existing under floor piping or the existing structural slab conditions.

The Acorn Vacuum System is a drainage system that uses vacuum pressure to collect and remove condensation from the refrigeration cases and deposit it in the mop basin in an enclosed room. The condensate vacuum system includes pumps, tanks, valves, and electrical control panel. These systems are used in some new stores as well as remodels.

The control panel will set off alarms that need to be attended to. There is an interactive user read out on the front of the panel and phone numbers to call to walk through the process of clearing an alarm. The alarm panel is also tied into the REMS panel which will notify the store and Facilities Management Operations Center (FMOC) of any alarms that needs to be addressed.

Some of the condensate vacuum skids may be connected to the emergency generator, but not all of them. Currently there is no tracking of which of these are tied into the generator and which are not. If the pump is tied into the generator, it will still work when there is a power outage.

There are phone numbers on the control panel for the support line of Acorn Vac.

Figure 1 – Acorn Vac skid with control panel.



Figure 2 – EVAC condensate vacuum skid with control panel



There are only 8 stores that utilize the EVAC condensate vacuum systems (this is different from the Acorn system).

T-0819, T-1385, T-1542, T-0012, T-1436, T-1443, T-1256, T-1804

Things to be aware of if there is an Acorn Vacuum system at the store:

1. If there is a scheduled power outage, the store will want to take necessary precautions with the product in the cases. The ice merchandiser should not be left full of ice, this will melt and run all over the floor.
2. When walking thru the market area, listen for a hissing sound. This sound is caused by something sticking in the extraction valve. To activate the valve, simply push the button on the valve (on top of the case) and that usually takes care of it. Pouring a little water in the case that is making the noise will also trigger the valve without having to climb on top of the case.
3. Price tags and other debris should be kept out of the bottom of the cases.
4. The mop basin in the vacuum room is used only for the discharge from the vacuum tanks. There should be no buckets, mops or cleaning supplies kept at this mop basin. This should be kept free of debris. Everything that is in the bottom of the cases will end up in the mop basin, so it will need to be cleaned out on a regular basis.
5. Water should be reported on the floor around the refrigerated cases.
6. Alarms on the control panel should be responded to.

Please utilize the following link http://wiki.target.com/tgtwiki/index.php/Condensate_Vacuum to locate the following information:

- Condensate Vacuum Equipment Use
- Maintenance
- Troubleshooting
- Service requests

The control panel will set off alarms that need to be attended to. There is an interactive user read out on the front of the panel and phone numbers to call to walk through the process of clearing an alarm. The alarm panel is also tied into the REMS panel which will notify the store and Facilities Management Operations Center (FMOC) of any alarms that needs to be addressed.

Some of the condensate vacuum skids may be connected to the emergency generator, but not all of them. Currently there is no tracking of which of these are tied into the generator and which are not. If the pump is tied into the generator, it will still work when there is a power outage.

There are phone numbers on the control panel for the support line of Acorn Vac.

Figure 1 – Acorn Vac skid with control panel

EMS Controllers

Target uses specific energy management system (EMS) software to control and/or monitor our Refrigeration, HVAC, and Lighting equipment:

Einstein 2 (E2) Controller:

1. The (E2) controller is a microprocessor-based control system used primarily to control and/or monitor refrigerated cases, compressor groups, condensers, and other mechanisms of refrigeration building control. These controllers are found at the majority of Target locations.
 - a. Note: Not all refrigerated cases are connected to the E2 controllers (i.e. Checklanes coolers, Food Avenue under counter equipment, etc.).
 - b. Note: Some Target locations utilize the E2 controllers to control and/or monitor the HVAC and Lighting equipment (City Targets: T3200, T3201, T3202, Super Target: T1767).
2. Target can interface with the E2 controllers via the following systems:
 - a. Ultrasite and Connect+: Allows team members to communicate with the E2 controller via a specified network computer IP address and view system point values. Alarms sent to SBN can be investigated with Ultrasite and Connect+ to help diagnose and troubleshoot the root cause(s)
 - b. Terminal Mode: This feature allows team members to see the screen of the E2 exactly as it is on site. This can be used to remotely assist technicians with what they are seeing on the store's E2 controller.
 - i. Note: Due to an identified security risk, terminal mode has been disabled via the built in webpage on the E2. Locally, technicians will need to log into the controller itself. Terminal mode within Ultrasite and Connect+ is the only available terminal access at Target.

Web Control Controller:

1. Web Control is a web-based automated building control system used primarily to control and/or monitor HVAC and Lighting system values, schedules, zones, and equipment trends.

Refrigeration EMS Circuit Naming Convention

The Target Standard for naming **refrigeration** circuits in the EMS Einstein Controller software (E2) is listed below. Stores opened or remodeled after December 2015 will follow the format listed below. Existing stores may still reflect a non-standardized naming convention.

XXXX_XXX_XXX_X

System Operation

System Operation is defined as the aggregate of all assets dependent on other equipment to operate according to the design strategy.

S - Self Contained - (Compliance)

R – Refrigerant Distributed (Rack/CU)

C – Cascade System

T - Transcritical

W - Water Distributed (Micro Distributed)

G – Glycol Distributed (At Case)

E - Energy Management System

A – Accessory

System Configuration

System Configuration is defined as the dependency of system operation.

Subcooler- No naming Convention, identify as Verify QC (column H) Super Target Only

Suction Floating, follow R1OF_CMP_A example; R1OR_CMP_B or R2OR_CMP_B Super Target Only No Maximo Asset

A – Air Cooled

W – Water Cooled

L – Landlord

V - Vendor

C- Controls

O - CO2 refrigerant heat exchanger on Cascade System

G - Glycol heat exchanger on Cascade system

1 - 1st Suction Group sales floor cases (Per system Identifier)

2 - 2nd Suction Group sales floor cases (Per same system identifier as 1, ect)

System Location

System Location is defined as the physical location of that asset within the store.

Store

O - Offstage | BACKROOM

M - Grocery/Market | SALESFLOOR

F – Front of Store | FRONT_END

B – Starbucks | STARBUCKS

A – Food Ave/Café | FOOD_AVENUE

L - Liquor | LIQUOR_STORE

S - Sales | SALESFLOOR

U - Grocery Pick-Up | GPU

Remote

R – Roof | ROOF

G - Ground | EXTERIOR

P - Parking Ramp | PARKING_RAMP

C – Common Area | COMMON_AREA

T - Trash Room/Trash Cooler

System Temperature

System Temperature is defined as the operating temperature of the Asset.

System Temperature

F – Freezer (-10)

R – Refrigerator (34)

L - Floral

G - Grab & Go

X - Meal Destination

2 – Multiple suction groups compressor rack

Product Temperature

2 – Dual Temp Case

I – Ice (-8)

S – Seafood Freezer (-5)

K – Bakery Freezer (-5)

M – Meat (30)

- Meat Prep (38)

D – Dairy/Bakery/Deli Cooler (34)

B – Beverage/Beer (34)

P – Produce (36)

A – Ambient/Prep (58)

System Asset

System Asset is an identifier of the physical asset type.

Guest Facing

XXD - Door Display Case (X=Number of Doors)

XXF - Feet of display Case (X=Linear Feet)

ISL - Island Display Case

BNK - Bunker Display Case

BIN - Produce Bin

CLC - Check Lane Cooler

GDM - Glass Door Merchandiser

SDC - Seafood Display Case

SBX - Starbucks Display Case

FLX - Flexible Merchandiser

IMD - Ice Merchandiser

Off Stage

ACC - Air Cooled Condenser

ACF - Air Cooled Fluid Cooler

ACU - Air Cooled Condensing Unit (Compliance)

ADC - Adiabatic Condenser

ADF - Adiabatic Fluid Cooler

CMP - Compressors (Compliance)

CTU - Countertop Unit

DSL - Dry Storage Labeling

ECC - Evaporative Cooled Condenser

EFC - Evaporative Fluid Cooler

EVP - Evaporator Coil

FWW - Fabricated Wall Walk-in

ICE - Ice Maker

MPR - Meat Prep Room

PMP - Pump Skid

PTB - Prep Table

REM - Refrigeration Energy Management

RIU - Reach In - Stock Room Upright

RTR - Retarder

RSD - Roll Seal Door

SPR - Spare

SUB - Subcooler

SKY - Sky Cool Panels

SKP - Sky Cool Pump

SKH - Sky Cool Heat Exchanger

UCU - Under Counter Unit

WIB - Walk-in Box

WWC - Water Water Chiller (Compliance)

WCU - Water cooled Condensing Unit (Compliance)

HTX - Heat Exchanger

System Identifier

System Identifier is a unique letter that denotes the dependency as described in System Operation. For Self Contained assets a number sign is utilized to identify total asset count. For Lettered systems this Identifier represents a refrigerant charge utilized for Compliance reporting.

A-Z Systems with dependencies

or

Stand alone self contained systems

System Circuit Identifier

System Circuit Identifier is a unique number identifying a branch of the System identifier. Each branch shall have a different number. For Self Contained each asst gets a unique number according to guidelines (Below or to right)
01-99 for F&B systems

100-999 for Stand alone self contained systems

Number of Assets in System

Number of assets identifies the number of physical assets connected to that Circuit according to guidelines (Below or to the right)

0-9 Number of assets that make up Doors (XXD) or Feet (XXF)

or

A-Z Number of assets that make up Island o Bunker configuration

Refrigeration Lighting

Lighting Control:

- Refrigeration lighting is currently controlled by the following:
 - REMS System (Einstein Controllers)
 - Typically controls case lighting in the following locations:
 - Stores opened or remodeled after 2011
 - You may find new or remodeled stores with REMS control prior to 2011
 - EMS System (Web Control)
 - Typically controls case lighting in the following locations:
 - Stores opened or remodeled prior to 2011
 - You may find new or remodeled stores with REMS control prior to 2011
 - Case control (this is controlled by the case itself).
 - Includes older equipment or self-contained units that have the lights controlled within the case itself (i.e. TRUE cases).

Lighting Schedules:

- These stores typically utilize the following lighting schedule:

- Sales floor cases: Time of store open to time of store close.
- Walk in Freezers and Coolers: No schedule exists at this time.

LED Lighting:

- LED Lighting has been implemented in many P Fresh, City, Small Format stores, and Super Target's.
 - Sales Floor Freezer and Cooler Cases **with** doors and Sales Floor Open Cases
 - These lights are **not** motion activated and are always on during normal **schedule hours**.
 - Walk in Coolers:
 - LED lights in Walk in Coolers are controlled by a switch and are **not** motion activated
 - After 2012, LED Lighting was implemented in the Walk-in Coolers
 - Walk in Freezers:
 - LED lights in Walk in Freezers are controlled by a switch and are not motion activated
 - After 2012, LED Lighting was implemented in the Walk-in Freezers

Suction Pressure/Temperature settings by Refrigerant Type: (P Fresh, City, Super, and P&G Stores)

Suction Temp (F)	Suction Pressure by Refrigerant Type					
	R-404A	R-134A	R-22	R-407A	R-744	
-26*	12-13	--	6.5-7.5	5-6		8-9
-25*	12-13	--	7-8	5.5-6.5		
-24	13-14	--	7.5-8.5	6-7		
-22**	15-16	--	8.5-9.5	7-8	185-192	
-18***	17-18	--	11-12	9-10	188-196	11-12
-15****	19.5-20.5	--	13-14	11-12	196-204	
-14	20-21	--	13.5-14.5	12-13		
+15	49-50	15-16	37-38	36.5-37.5		38-39
+16	50-51	15-16	38.5-39.5	37.5-38.5		
+18**	52-53	16.5-17.5	40.5-41.5	39.5-40.5		48-50
+20	55-56	18-19	42.5-43.5	42-43		
+22***	57.5-58.5	19.5-20.5	45-46	44-45		
+24	60.5-61.5	21-22	47-48	46.5-47.5		
+26*	63-64	22-23	49.5-50.5	49-50		

*This used to be the suction temp setting for stores with Walk in Freezers on the Rack, but since the -15 to -10 adjustment on the Walk in Freezers, should no longer be the case and should be set at -22 for the suction temp.

**Rack contains re-used Tyler cases

*** Rack does not contain re-used Tyler cases

**** Suction Settings may differ with Zero Zone Cases

Note: Stores which utilize floating suction may float within a wider range of its specified pressure above.

Defrost Types and Descriptions: All Prototypes (P Fresh, City, Super, and P&G Stores)

Electric Defrost

This style of defrost removes frost from the evaporator. Instead of utilizing hot gas, electric defrosts utilize cowl rod heaters similar to those used in an electric oven. The heating elements are turned “on” for defrost and “terminated” (turned off) based on an adequate temperature within the unit.

Advantages of Electric Defrost:

- Systems are easy to service and maintain by refrigeration technicians.
- Reduced ice formation, which can sometimes be found in other hot gas systems. This is due to the heating element residing within the drain pan to melt any ice formation.

Disadvantages of Electric Defrost:

- Increased length of time required to defrost the case
- Increased energy needed during defrost versus a hot gas system.

Loop systems:

A loop system refers to the refrigerant piping arrangement. In this type of system, there is one large liquid line and one large suction line that goes from the rack to the sales floor. This differs from a hot gas system which selectively diverts gas to **individual** refrigeration circuits. For this reason, a loop system will not function with a hot gas defrost and instead utilizes electric defrost.

Hot Gas (Straight-Time) Defrost

As part of the refrigeration process, normally directed gas / vapor to the condenser is diverted to the evaporator for defrost. Depending on the refrigerant, gas temperatures range from 140 to 230 degrees. Heat removed from 75% of the refrigerated equipment is used to defrost 25% of it, and this ratio should not be exceeded. The rack will not have enough load to keep the compressors running if too many circuits are placed into defrost at the same time. This is the reason why defrost times are scattered throughout the day and not scheduled all at once in Ultrasite.

This type of defrost is normally limited or terminated based on temperature to prevent the case from getting too warm during a defrost cycle.

Advantages of Hot Gas Defrost:

- You get 2 ½ to 3 times the amount of energy out for the energy put in (i.e. free heat due to rerouting gas).
- The defrost cycle is very quick compared to an electric defrost cycle

Disadvantages of Hot Gas Defrost:

- Knowledge required; maintenance of this type of system requires a more detailed understanding of the process, which not all refrigeration technicians are trained on.
- More maintenance is required to sustain this type of system. This is due to the constant expansion and contraction of the copper piping during defrost, which can cause separation along areas where the pipe soldering has occurred. This can eventually lead to leaks

Hot Gas Pulsed Defrost

Pulsed defrost works in much the same way as noted above, except that the hot gas is turned on and off intermittently during the defrost cycle time period. Pulsed defrost turns on for 4 minutes initially, and is set to maintain 70 degrees with a 5 degree dead band. Therefore, when the temperature sensor mounted on the evaporator coil gets up to 72.5 degrees, the defrost turns off. If the temperature falls to 67.5 degrees, the defrost turns on. This may turn on and off in intervals of one minute or longer.

Advantages of Pulsed Defrost:

- The prevention of case overheating, which is typical of a “straight time” gas defrost.
- Maximization of the thermal energy (BTUH) available in the hot gas / vapor. This is because gas is allowed to regenerate from time defrost is pulsed off to time that it is pulsed back on.
- Energy efficiency: this type of gas defrost is in most instances more energy efficient than “straight time” gas defrost. This is because cases are not as warm following defrost, and not as much energy is necessary to lower the temperature.
- Decreased ice formation and adequate heating of the drain pan for condensation drainage.
- Prevention of a de-merchandising/deicing event at that store.

Disadvantages of Pulsed Defrost (similar to those noted in “straight time” hot gas defrosts):

- Knowledge required: maintenance of this type of system requires a more detailed understanding of the process, which not all refrigeration technicians are trained on.
- More maintenance is required to sustain this type of system. This is due to the constant expansion and contraction of the copper piping during defrost, which can cause separation to occur along areas where the pipe has been soldered. This can eventually lead to leaks.

All P Fresh stores with hot gas availability will receive a pulsed defrost strategy going forward. However, not all cases with a hot gas defrost utilize a pulsed defrost. Refer to the Defrost/Alarm schedule for listings of which cases utilize this type of defrost.

Defrost termination and Minimum Defrost Duration

Freezers (and sometimes coolers) operate with defrost terminations and minimum defrost durations. This means that the defrost cycle will run for the intended duration unless it reaches a temperature higher than what is specified for that time period. If this occurs, the defrost cycle will then terminate. Cases which have defrost terminations and minimum defrost durations are called out in the Defrost/Alarms section of the document.

Defrost/Alarm Settings: P Fresh, Flex Format, Super, P&G Stores

BRAND /MODEL	FIXTURE TYPE	TEMP SET POINT (F)	DUAL TEMP SET POINT (F)	HIGH ALARM LIMIT (F)	DUAL TEMP HIGH ALARM LIMIT (F)	LOW ALARM LIMIT (F)	DUAL TEMP LOW ALARM LIMIT (F)	ALARM DELAY *(MIN)	TYPICAL DEFROST TYPE	# OF DEFROSTS PER DAY	DEFROST DURATION (MIN)	DEFROST TERM (F)	MIN DEFROST (MIN)
TYLER	*WHEN IN DEFROST, 30 MIN ADDED TO ALARM DELAY (SEE ABOVE) BEFORE HIGH TEMP ALARM TRIGGERED (I.E. IF ALARM DELAY IS 60 MIN, WILL NOT ALARM UNTIL 90 MIN) **P&G AND SELECT SUPER TARGET PROTOTYPES WITH NO EEPR CONTROL MAY STILL REFLECT A -12 SET POINT ***NON-PFAB STORES PRODUCE CASES REFLECT 36 DEG SET PT & HIGH ALARM SET PT OF 46, PFAB STORES REFLECT 34 DEG SET PT & HIGH ALARM SET PT OF 41 ****NON-PFAB STORES MEAT CASES REFLECT 28 DEG SET PT & HIGH ALARM SET PT OF 38-40, PFAB STORES REFLECT 30 DEG SET PT & HIGH ALARM SET PT OF 40												
LRPHP	ISLAND PRODUCE	36	--	46	--	26	--	60	OFF TIME	6	12	--	--
N2MHP	MULTI-DECK MEAT	28	--	40	--	20	--	60	OFF TIME	6	16-26	48 (WHERE APPLICABLE)	15-20 (WHERE APPLICABLE)
N3HMGHP	MULTI-DECK MEAT	29	--	40	--	20	--	60	OFF TIME	6	32	--	--
N5FG(N)(A)	IC GLASS DOORS	**-8	--	5	--	--	--	60	PULSED HOT GAS	1	25	70	4
									ELECTRIC	1	60	55 (WHERE APPLICABLE)	30
									HOT GAS	1	18-25	65	8
	DUAL TEMPERATURE	**-8	34	5	41	--	26	60	PULSED HOT GAS	1	25	70	4
									HOT GAS	1	18-25	65	8
									ELECTRIC	1	60	55 (WHERE APPLICABLE)	30
									OFF TIME	1	60	--	--
N5NGN(A)/P5NGN(A)	MED TEMP GLASS DOORS	34	--	41	--	26	--	60	OFF TIME	1	60	--	--
N6DHPL / N6DHPACL / N6DHPM	MULTI-DECK PRODUCE	***34/36	--	***41/46	--	26	--	60	OFF TIME	6	16-26	48 (WHERE APPLICABLE)	15-20 (WHERE APPLICABLE)
	MULTI-DECK BEVERAGE / BEER	34	--	41	--	24	--	60	OFF TIME	6	16-26	48 (WHERE APPLICABLE)	15-20 (WHERE APPLICABLE)
	MULTI-DECK DAIRY	34	--	41	--	26	--	60	OFF TIME	6	16-26	48 (WHERE APPLICABLE)	15-20 (WHERE APPLICABLE)
	MULTI-DECK MEAT	****28/30	--	****38/40	--	20	--	60	OFF TIME	6	16-26	48 (WHERE APPLICABLE)	15-20 (WHERE APPLICABLE)
N6MHPM	MULTI-DECK MEAT	****28/30	--	****38/40	--	20	--	60	OFF TIME	6	16-26	48 (WHERE APPLICABLE)	15-20 (WHERE APPLICABLE)
	MULTI-DECK DAIRY	34	--	41	--	26	--	60	OFF TIME	6	16-26	48 (WHERE APPLICABLE)	15-20 (WHERE APPLICABLE)
	MULTI-DECK PRODUCE	***34/36	--	***41/46	--	26	--	60	OFF TIME	6	16-26	48 (WHERE APPLICABLE)	15-20 (WHERE APPLICABLE)
N6PHP(M)	MULTI-DECK PRODUCE	***34/36	--	***41/46	--	26	--	60	OFF TIME	6	12	--	--
NPW	ISLAND PRODUCE	36	--	46	--	26	--	60	OFF TIME	1	60	--	--

BRAND /MODEL	FIXTURE TYPE	TEMP SET POINT (°F)	DUAL TEMP SET POINT (F)	HIGH ALARM LIMIT (F)	DUAL TEMP HIGH ALARM LIMIT (F)	LOW ALARM LIMIT (F)	DUAL TEMP LOW ALARM LIMIT	ALARM DELAY *(MIN)	TYPICAL DEFROST TYPE	# OF DEFROSTS PER DAY	DEFROST DURATIO N (MIN)	DEFROST TERM (F)	MIN DEFROST (MIN)
NTJ (E) (CX) /NFJE (CX)	COFFIN DUAL TEMP	**-8	24/27	5	38	--	18	60	HOT GAS	1 TO 3	16-30	65-Defrost Term Sensor,	12
									ELECTRIC	1	60	50	30
	IC GLASS DOORS	**-8	--	5	--	--	60	PULSED HOT GAS	1	25	70	4	
								ELECTRIC	1	45	55 (WHERE APPLICABLE)	30	
								HOT GAS	1	18-25	65	8	
P5FG (N)	DUAL TEMPERATURE	**-8	34	5	41	--	26	60	PULSED HOT GAS	1	25	70	4
									HOT GAS	1	18-25	65	8
									ELECTRIC	1	60	55 (WHERE APPLICABLE)	30
									OFF TIME	1	60	--	--
HUSSMANN		*WHEN IN DEFROST, 30 MIN ADDED TO ALARM DELAY BEFORE HIGH TEMP ALARM TRIGGERED (I.E. IF ALARM DELAY IS 60 MIN, WILL NOT ALARM UNTIL 90 MIN) **P&G AND SELECT SUPER TARGET PROTOTYPES WITH NO EEPR CONTROL MAY STILL REFLECT A -12 SET POINT ***NON-PFAB STORES PRODUCE CASES REFLECT 36 DEG SET PT & HIGH ALARM SET PT OF 46, PFAB STORES REFLECT 34 DEG SET PT & HIGH ALARM SET PT OF 41 ****NON-PFAB STORES MEAT CASES REFLECT 28 DEG SET PT & HIGH ALARM SET PT OF 38-40, PFAB STORES REFLECT 30 DEG SET PT & HIGH ALARM SET PT 40											
C2XXEP	OPEN LOW PROFILE MEAT	30		40	--	20	--	60	OFF TIME	2	30	--	--
C4LE	MULTI-DECK PRODUCE	36	--	*41/46	--	26	--	60	OFF TIME	4	30	48 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
C5E / C5LE	MULTI-DECK PRODUCE CASE	***34/36	--	***41/46	--	26	--	60	OFF TIME	4	30	48 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
	MULTI-DECK MEAT	29/30	--	40	--	20	--	60	OFF TIME	4	30	48 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
	MULTI-DECK DAIRY	31		41	--	26	--	60	OFF TIME	4	30	48 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
C5X-LEP	MULTI-DECK MEAT	30	--	40	--	20	--	60	OFF TIME	2	30	48 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
	MULTI-DECK PRODUCE	***34/36	--	***41/46	--	26	--	60	OFF TIME	2	30	48 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
	MULTI-DECK DAIRY	34	--	41	--	26	--	60	OFF TIME	2	30	48 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
D5(E) / D5(LE)	MULTI-DECK BEER /	34	--	41	--	26	--	60	OFF TIME	4	35	48 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
	MULTI-DECK DAIRY	34		41	--	26	--	60	OFF TIME	4	35	48 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
	MULTI-DECK DELI	32		41	--	26	--	60	OFF TIME	4	35	45 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)

BRAND /MODEL	FIXTURE TYPE	TEMP SET POINT (F)	DUAL TEMP SET POINT	HIGH ALARM LIMIT (F)	DUAL TEMP HIGH ALARM LIMIT (F)	LOW ALARM LIMIT (F)	DUAL TEMP LOW ALARM	ALARM DELAY *(MIN)	TYPICAL DEFROST TYPE	# OF DEFROSTS PER DAY	DEFROST DURATION (MIN)	DEFROST TERM (F)	MIN DEFROST (MIN)
DK	MULTI-DECK DAIRY	34	--	41	--	26	--	60	OFF TIME	6	40	--	--
ESBDHV	MULTI-DECK DELI	29	--	41	--	20	--	60	OFF TIME	2	60-90	45-60 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
E2SP	BAKERY SERVICE	30	--	41	--	20	--	60	OFF TIME	2	60	48 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
E3	MULTI-DECK DELI /BAKERY	29	--	41	--	24	--	60	OFF TIME	4	40	45 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
ID5SM	MULTI-DECK DAIRY (HAPPY COW)	32	--	41	--	26	--	60	OFF TIME	6	20	--	--
IM-04	ISLAND MEAT	34	--	41	--	26		60	OFF TIME	6	20	--	--
ISLA	ISLAND MULTI-DECK MEAT	27	--	40	--	20	--	60	OFF TIME	6	20	45 (WHERE APPLICABLE)	10 \ (WHERE APPLICABLE)
	ISLAND MULTI-DECK DAIRY	32	--	41	--	26	--	60	OFF TIME	6	20	45 (WHERE APPLICABLE)	10 \ (WHERE APPLICABLE)
LW	SINGLE DECK FROZEN FOOD	**-8	5	--	--	--	--	60	HOT GAS	1	15-18	48 (where applicable)	8
									ELECTRIC	1	60	48 (where applicable)	20
P2	MULTI-DECK PRODUCE	36	--	46	--	26	--	60	OFF TIME	4	30	48 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
Q3.5	MULTI-DECK DELI/BAKERY	31		41		26		60	OFF TIME	6	25	45	15 (WHERE APPLICABLE)
Q4-DC	BAKERY/DELI SERVICE	28	--	41	--	20	--	60	OFF TIME	3	40	45	15 (WHERE APPLICABLE)
R3	MULTI-DECK DELI	30	--	40	--	20	--	60	OFF TIME	4	40	45 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
RI-3N	MULTI-DECK DELI	30	--	41	--	24	--	60	OFF TIME	6	20	48 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
	MULTI-DECK PRODUCE	***34/36	--	***41/46	--	26	--	60					
RL/ RLN	IC GLASS DOORS	**-8	--	5	--	--	--	60	PULSED HOT GAS	1	25	70	4
									HOT GAS	1	20	65/70	8
									ELECTRIC	1	45	50/55	20
	DUAL TEMPERATURE	**-8	34	5	41	--	26	60	PULSED HOT GAS	1	25	70	4
									ELECTRIC	1	60	50/55	20
									OFF TIME	1	60	--	--
RMN	MED TEMP GLASS DOORS	34	--	--	41	--	26	60	OFF TIME	1	60	--	--
SFNG	ENDCAP BUNKER OF ISLA	-6	27	5	38	--	18	60	ELECTRIC	2	30	48 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
Q2	Experience Center	36	-	46	-	26	-	60	OFF TIME	4	30	-	-

BRAND /MODEL	FIXTURE TYPE	TEMP SET POINT (F)	DUAL TEMP SET POINT (F)	HIGH ALARM LIMIT (F)	DUAL TEMP HIGH ALARM LIMIT (F)	LOW ALARM LIMIT (F)	DUAL TEMP LOW ALARM LIMIT (F)	ALARM DELAY *(MIN)	TYPICAL DEFROST TYPE	# OF DEFROSTS PER DAY	DEFROST DURATIO N (MIN)	DEFROST TERM (F)	MIN DEFROST (MIN)
HILL PHOENIX		*WHEN IN DEFROST, 30 MIN ADDED TO ALARM DELAY BEFORE HIGH TEMP ALARM TRIGGERED (I.E. IF ALARM DELAY IS 60 MIN, WILL NOT ALARM UNTIL 90 MIN) **P&G AND SELECT SUPER TARGET PROTOTYPES WITH NO EEPR CONTROL MAY STILL REFLECT A -12 SET POINT ***NON-PFAB STORES PRODUCE CASES REFLECT 36 DEG SET PT & HIGH ALARM SET PT OF 46, PFAB STORES REFLECT 34 DEG SET PT & HIGH ALARM SET PT OF 41											
JNRBHA	MED TEMP GLASS DOORS	34	--	--	41	--	26	60	OFF TIME	1	50-60	40-48 (WHERE APPLICABLE)	20 (WHERE APPLICABLE)
JNRBHL	MED TEMP GLASS DOORS	34	--	--	41	--	26	60	OFF TIME	2	30	40-48 (WHERE APPLICABLE)	20 (WHERE APPLICABLE)
JNRZHA	IC GLASS DOORS	** -8	--	5	--	--	--	60	ELECTRIC	1	40-45	48 (WHERE APPLICABLE)	20 (WHERE APPLICABLE)
JNRZHL	IC GLASS DOORS	** -8	--	5	--	--	--	60	PULSED HOT GAS	1	25	70	4
									ELECTRIC	1	46	60	20
	DUAL TEMPERATURE	** -8	34	5	41	--	26	60	PULSED HOT GAS	1	25	70	4
									ELECTRIC	1	60	60	20
									OFF TIME				
OB	ORCHARD BIN	36	--	46	--	26	--	60	--	--	--	--	--
OHPH	MULTI-DECK PRODUCE CASE	36	--	46	--	26	--	60	OFF TIME	3	45	--	--
ONNS	MULTI-DECK BEVERAGE CASE	36	--	48	--	26	--	60	OFF TIME	6	40	47 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
ONRB	MULTI-DECK DELI GLASS DOORS	36	--	41	--	26	--	60	OFF TIME	4	30	47 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
OIP	ISLAND PRODUCE	34		48		26		60	OFF TI ME	3	44	38 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
ONRZH /ORZH	IC GLASS DOORS CASE	** -8	--	5	--	--	--	60	HOT GAS	1	24	73	10
									ELECTRIC	1	46	60	20
	DUAL TEMPERATURE	** -8	34	5	41	--	26	60	ELECTRIC	1	60	60	20
									OFF TIME				
	MED TEMP GLASS DOORS	--	34	--	41	--	26	60	OFF TIME	1	60	--	--

BRAND /MODEL	FIXTURE TYPE	TEMP SET POINT (F)	DUAL TEMP SET POINT (F)	HIGH ALARM LIMIT (F)	DUAL TEMP HIGH ALARM LIMIT (F)	LOW ALARM LIMIT (F)	DUAL TEMP LOW ALARM LIMIT (F)	ALARM DELAY *(MIN)	TYPICAL DEFROST TYPE	# OF DEFROSTS PER DAY	DEFROST DURATIO N (MIN)	DEFROST TERM (F)	MIN DEFROST (MIN)
OWIZ /OWEZ	COFFIN DUAL TEMP	-6	27	5	38	--	18	60	HOT GAS	1	20	60	10
									ELECTRIC	1	60	50	20
O3UM	MULTI-DECK MEAT	30	--	40	--	20	--	60	HOT GAS	3	15	45	5
									OFF TIME	3	40	45	15
O5DM	MULTI-DECK PRODUCE CASE	36	--	46	--	26	--	60	OFF TIME	4	32	47 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
	MULTI-DECK DAIRY	34	--	41	--	26	--	60	OFF TIME	4	32	47 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
	MULTI-DECK BEER/BEVERAGE	34		41		26		60	OFF TIME	4	32	47 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
	MULTI-DECK MEAT CASE	30	--	40	--	20	--	60	OFF TIME	4	32	47 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
	MULTI-DECK MEAT CASE	30	--	40	--	20	--	60	HOT GAS	4	32	47 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
O5DM-NRG	MULTI-DECK PRODUCE	***34/36	--	***41 /46	--	26	--	60	OFF TIME	6	30	47 (WHERE APPLICABLE)	15 (WHERE APPLICABLE)
O5DR-NRG	MULTI-DECK DAIRY	34	--	41	--	26	--	60	OFF TIME	6	40	42	15 (WHERE APPLICABLE)
O5M-NRG	MULTI-DECK MEAT	30	--	40	--	20	--	60	OFF TIME	6	40-45	42-45	15 (WHERE APPLICABLE)
	MULTI-DECK MEAT ON CU	28	--	40	--	20	--	60	OFF TIME	6	40-45	42-45	15 (WHERE APPLICABLE)
	MULTI-DECK PRODUCE	***34/36	--	***41 /46	--	26	--	60	OFF TIME	6	40-45	48	15 (WHERE APPLICABLE)
	MULTI-DECK DAIRY	34	--	41	--	26	--	60	OFF TIME	6	40-45	48	15 (WHERE APPLICABLE)
	MULTI-DECK PROMOTION	32	--	40	--	26	--	60	OFF TIME	6	40-45	48	15 (WHERE APPLICABLE)
O5M	MULTI-DECK MEAT/ GRAB &	30	--	40	--	20	--	60	OFF TIME	6	40-45	42-45	15 (WHERE APPLICABLE)
	MULTI-DECK PRODUCE	***34/36	--	***41 /46	--	26	--	60	OFF TIME	6	40-45	48	15 (WHERE APPLICABLE)
	MULTI-DECK DAIRY	34	--	41	--	26	--	60	OFF TIME	6	40-45	48	15 (WHERE APPLICABLE)
	MULTI-DECK BEER/BEVERAGE	34	--	41	--	26	--	60	OFF TIME	6	40-45	48	15 (WHERE APPLICABLE)
	MULTI-DECK PROMOTION	32	--	40	--	26	--	60	OFF TIME	6	40-45	48	15 (WHERE APPLICABLE)
OB	Tiered Orchard Bin	36	-	46	-	26		60	OFF TIME	4	15-20	-	-

BRAND /MODEL	FIXTURE TYPE	TEMP SET POINT (F)	DUAL TEMP SET POINT (F)	HIGH ALARM LIMIT (F)	DUAL TEMP HIGH ALARM LIMIT (F)	LOW ALARM LIMIT (F)	DUAL TEMP LOW ALARM LIMIT (F)	ALARM DELAY *(MIN)	TYPICAL DEFROST TYPE	# OF DEFROSTS PER DAY	DEFROST DURATIO N (MIN)	DEFROST TERM (F)	MIN DEFROST (MIN)
SMD	Service Deli Bakery	28		38		18		60	OFF-TIME	4	65		36
PFI	Produce Island	27		41		26		60	OFF-TIME	6	45		15 (WHERE APPLICABLE)
HSC	Produce table	36	-	46	-	26		60	OFF TIME	3	15-20	-	-

BRAND /MODEL	FIXTURE TYPE	TEMP SET POINT (F)	DUAL TEMP SET POIN T (F)	HIGH ALARM LIMIT (F)	DUAL TEMP HIGH ALARM LIMIT (F)	LOW ALARM LIMIT (F)	DUAL TEMP LOW ALARM LIMIT (F)	ALARM DELAY *(MIN)	TYPICAL DEFROST TYPE	# OF DEFROST S PER DAY	DEFROST DURATIO N (MIN)	DEFROST TERM (F)	MIN DEFROST (MIN)
ZERO ZONE		*WHEN IN DEFROST, 30 MIN ADDED TO ALARM DELAY BEFORE HIGH TEMP ALARM TRIGGERED (I.E. IF ALARM DELAY IS 60 MIN, WILL NOT ALARM UNTIL 90 MIN)											
RVZC30	IC GLASS DOORS	**-8	--	5	--	--	--	60	HOT GAS	1	30	65	10
									PULSED HOT GAS	1	25	70	4
									ELECTRIC	1	45	50	20
	DUAL TEMPERATURE	**-8	34	5	41	--	26	60	HOT GAS	1	30	65	10
									PULSED HOT GAS	1	25	70	4
									ELECTRIC	1	60	50	20
									OFF TIME	1	60	65	10
RVCC30	MEDIUM TEMP GLASS DOORS	--	34	--	41	--	26	60	OFF TIME	2	30	--	--
VRBH	REACH IN BEER GLASS DOOR	34	--	41	--	26	--	60	OFF TIME	2	30	40	15 (WHERE APPLICABLE)
BARKER													
BDPF	MULTI-DECK DELI	28	--	41	--	20	--	60	OFF TIME	4-6	20-30	48	15 (WHERE APPLICABLE)
BDPTD	MULTI-DECK DELI / SUSHI / CHEESE	28	--	41	--	20	--	60	OFF TIME	6	20-30	48	15 (WHERE APPLICABLE)
BLF	BAKERY SERVICE	28	--	41	--	20	--	60	OFF TIME	4-6	20-30	48	15 (WHERE APPLICABLE)
BMD	MULTI-DECK DELI/MEAT	28	--	40/41	--	20	--	60	OFF TIME	6	20-30	48	15 (WHERE APPLICABLE)
QC72 / QC96	MULTI-DECK DELI	28	--	41	--	20	--	60	OFF TIME	6	20-30	--	--
Carter		*All cases have a 6 F deadband *Example: To achieve a -8 F case temperature, case will float down to -11 F and float up to -5 F											
ID	MULTI-DECK DAIRY	31	-	41	-	26	-	60	OFF TIME	6	45	52	20
ID	MULTI-DECK MEAT	27	-	41	-	26	-	60	ELECTRIC	6	45	52	20
ID	MUTLI-DECK PRODUCE	33	-	41	-	26	-	60	OFF TIME	6	45	52	20
ND	ISLAND CASE DAIRY	29	-	41	-	26	-	60	ELECTRIC	6	40	52	20
FC	GLASS DOOR MED TEMP	32	-	41	-	26	-	60	ELECTRIC	6	45	46	15

FD	DUAL TEMP GLASS DOOR CASE	-11	31	5	41	-	26	60	ELECTRIC	2	45	39	10
Floraline													
SP-60	OPEN FLORAL	34	--	55	--	20	--	60	OFF TIME	2	60	--	---
Traullsen													
G31310	Self contained Upright Door case-Freezer	-10	-	10	-	-	-	60					
G20010	Self contained Upright Door case-Cooler	35	-	41	-	26	-	60					

****Note: existing Super Targets with Manual EPR control will retain their previous settings within the sales floor freezers and will not necessarily reflect the -8 degree set point listed in the table above. Click here for a listing of these stores: [No EEPR Control](#).**

BRAND /MODEL	FIXTURE TYPE	TEMP SET POINT (F)	DUAL TEMP SET POINT (F)	HIGH ALARM LIMIT (F)	DUAL TEMP HIGH ALARM LIMIT (F)	LOW ALARM LIMIT (F)	DUAL TEMP LOW ALARM LIMIT (F)	ALARM DELAY *(MIN)	TYPICAL DEFROST TYPE	# OF DEFROSTS PER DAY	DEFROST DURATIO N (MIN)	DEFROST TERM (F)	MIN DEFROST (MIN)
<div>*WHEN IN DEFROST, 30 MIN ADDED TO ALARM DELAY BEFORE HIGH TEMP ALARM TRIGGERED (I.E. IF ALARM DELAY IS 60 MIN, WILL NOT ALARM UNTIL 90 MIN)</div> <div>** SOME SELECT OLDER SUPER TARGETS MAY HAVE A 45 MIN AND NOT 60 MIN DEFROST DURATION (MOST HAVE 60)</div> <div>***NOT ALL WALK IN FOOD AVENUE COOLER/ FREEZER DEFROSTS CONTROLLED BY E2 CONTROLLER</div> <div>****SOME SELECT OLDER SUPER TARGETS MAY HAVE A 40 MIN AND NOT 60 MIN DEFROST DURATION (MOST HAVE 60)</div> <div>*****SOME SELECT OLDER SUPER TARGETS MAY STILL HAVE -15 DEGREE TEMP SET PT IN WALK IN FREEZERS IF SPECIAL EQUIPMENT EXISTS WHICH DOES NOT ALLOW A -10 DEGREE SET PT</div>													
--	WALK IN DAIRY COOLER	34	--	41	--	26	--	60	OFF TIME	3	**60	--	--
--	WALK IN DRY STORAGE AREA	58	--	68	--	40	--	90	OFF TIME	2	50	--	--
--	***WALK IN FOOD AVENUE COOLER	34	--	41	--	26	--	60	--	2	60	--	--
--	WALK IN MEAT COOLER	28	--	38	--	18	--	60	ELECTRIC	3	30	55	10
									HOT GAS (ON RTCR)	3	16	65	10
--	WALK IN MEAT PREP / PRODUCE PREP AREA	38	--	60	--	28	--	90	OFF TIME	2	60	--	--
--	WALK IN LABELING ROOM	58	--	68	--	40	--	90	OFF TIME	2	50	--	--
--	WALK IN PRODUCE COOLER	36	--	46	--	26	--	60	OFF TIME	3	****60	--	--
--	WALK IN BAKERY / DELI COOLER	34	--	41	--	26	--	60	OFF TIME	3	****60	--	--
--	WALK IN BEER COOLER / CAVE	34	--	41	--	26	--	60	OFF TIME	3	60	--	--
--	*** WALK IN FOOD AVENUE FREEZER	-5	--	10	--	--	--	60	ELECTRIC	3	30	55	10
--	MAIN/GPU WALK IN FREEZER	*****-10	--	10	--	--	--	60	ELECTRIC	3	30	55	10
									HOT GAS	3	16	65	10
--	WALK IN GPU COOLER	34	--	41	--	--	--	60	ELECTRIC	3	30	55	10
--	WALK IN BAKERY / DELI FREEZER	-5	--	10	--	--	--	60	HOT GAS	3	16	65	10 (WHERE APPLICABLE)
--	WALK IN SEAFOOD FREEZER	-5	--	10	--	--	--	60	HOT GAS	3	16	65	10 (WHERE APPLICABLE)

****A few select Super Targets may still have -15 degree set point in Walk in Freezers if special equipment exists which does not allow a -10 degree set point. For a list of these stores, refer to this [link](#).

BRAND /MODEL	FIXTURE TYPE	TEMP SET POINT (F)	DUAL TEMP SET POIN T (F)	HIGH ALAR M LIMIT (F)	DUAL TEMP HIGH ALARM LIMIT (F)	LOW ALAR M LIMIT (F)	DUAL TEMP LOW ALAR M LIMIT	ALARM DELAY *(MIN)	TYPICAL DEFROST TYPE	# OF DEFROSTS PER DAY	DEFROST DURATION (MIN)	DEFROST TERM (F)	MIN DEFROST (MIN)
STAND ALONE / SELF CONTAINED UNITS													
*WHEN IN DEFROST, 30 MIN ADDED TO ALARM DELAY BEFORE HIGH TEMP ALARM TRIGGERED (I.E. IF ALARM DELAY IS 60 MIN, WILL NOT ALARM UNTIL 90 MIN)													
**TEMPERATURE & DEFROST SETTINGS ON STAND ALONE CASES NOT UNDER CONTROL OF E2. HIGH & LOW ALARM LIMITS CURRENTLY ONLY MONITORED SETTINGS ON THESE CASES.													
ZERO ZONE													
2RVCP30	**FOOD AVENUE/ SERVICE COOLER	34	--	41	--	26	--	60	--	--	--	--	--
HILL PHOENIX													
ONNRS	**GRAB & GO COOLER	34	--	41	--	26	--	60	--	--	--	--	--
O3UMA	**GRAB & GO COOLER	34	--	41	--	26	--	60	--	--	--	--	--
HSC	**SINGLE DECK PRODUCE	36	--	46	--	26	--	60	--	--	--	--	
OB	**SINGLE DECK PRODUCE	36		46		26		60					
PF	**GRAB & GO COOLER FLORAL MEAL DESTINATION	34 FLORAL 34-38	--	41	--	--	--	--	--				
HUSSMANN													
Q2-SS-SC	**EXPERIENCE CENTER CASE	28	--	41	--	20	--	60	--	--	--	--	--
ID5SM	MULTI-DECK TASTE of TARGET	32	--	41	--	26	OFF TIME	20	OFF TIME	6	20	--	--
TRUE													
TVM-48SL-HC~SW01	**BABY COOLER	34	--	41	--	26	--	30	--	--	--	--	--
TVM-48SL-HC~SW01	**BABY COOLER	34	--	41	--	--	--	--	--				
FGD COOLER	OPU/GPU COOLER	34	--	--	--	--	--	--	--				

FGD FREEZER	OPU/GPU FREEZER	-5	--	--	--	--	--						
MISCELLANEOUS													
STRUCTURAL CONCEPTS OASIS	**SBUX WOC (Starbuck's Wall of Chill)	34	--	41	--	26	--	60	--	--	--	--	--
AHT GD XL SLIM	**FRESH PET COOLER	30	--	41	--	20	--	60	--	--	--	--	--
--	**FOOD AVENUE/ SERVICE FREEZER	-8	--	10	--	--	--	60	--	--	--	--	--
SOUTHERN CASE ARTS	FLORAL BEVERAGE GNG	34	--	--	--	--	--	--	--				

REMS Settings: (P Fresh, City, Super and P&G Stores)

Condensers	Name	Input	Set Point	High Limit (trips)	Low Limit	Delay (High Alarm)	Seasonal Split	Floating Condenser	Notes
Air Cooled, Pressure Controlled	Fan (Pressure) Control Set Point	Discharge pressure	86F (Hot Gas Defrost) 70 F (Electric Defrost)	129F	-	5 sec	Yes	-	Discharge pressure is maintained through cycling of fans. In Ultrasite condenser fan set point: 190 psig R404A, 95 psig R134a, 177 psig R407A. For FMOC alarming purposes: High alarm: 350 psig R404A, 195 psig R134a, 330 psig R407A.
	Condenser Hold Back Valve	Drop leg pressure	72F (Hot Gas Defrost) 60 F (Electric Defrost)	-	-	-	-	-	Mechanical A8 or A9 valves field set and verified. Electronic hold back valve controlled via REMs program.
	Receiver Pressurization Valve	Receiver pressure	67F (Hot Gas Defrost) 50 F (Electric Defrost)	-	-	-	-	-	Mechanical A8 or A9 valves field set and verified. Electronic receiver pressurization valve controlled via REMs program.
	Split	OAT	60 F	-	-	-	-	-	Split: Once the OAT temp falls below 57.5 F, split valve is energized "closed" the "summer only" half of the condenser fans are disabled, and the refrigerant is diverted to the "full time" side of the condenser only. When OAT rises above 62.5 F, split valve de-energizes "opening" the "summer only" half of the condenser and enabling the "summer only fans.
	Un-Split	Discharge pressure	102 F					-	Super Targets: When discharge pressure rises above 101 F, condenser is taken out of "Split Mode

	Fast Recovery	Discharge pressure	117 F	-	-	-	-	-	Medium Pressure Refrigerants (R404A, R449A, R448A, R407A, R22 fast recovery PSI = 300 Low Pressure Refrigerants R134A, R513A, R450A fast recovery PSI = 165
	Surge Ambient Cooling	Drop Leg pressure/temp	CI 12 F, CO 10 F	-	-	-	-	Yes	Condenser sub-cooling is calculated by converting the drop leg pressure to temperature then subtract the actual drop leg temperature from the conversion.

Evaporative Condenser	Drop Leg Temp	Drop Leg Temp – Temperature Differential Strategy	25° above outdoor Wet Bulb Temp (min. 78°, max. 110°)	129F	-	5 sec	N/A	-	See subheadings for evaporative condenser below. Super Targets: Fast Recovery enabled at 300psi Discharge Pressure. Each fan has a proof input for proof failure alarming
	Discrete Spray	Condenser Pump	-	-	-	-	-	-	Turns on anytime pump is OFF
	Condenser Water Temp	Water Sump Temp Sensor	Cl: 34 F, CO 32 F	-	32 F	-	-	-	-
	Condenser Flow Switch	Flow Switch Dry Contacts Relay	Flow Switch Dry Contacts Relay	Alarms when OFF (no relay closure)	-	1 min	-	-	Flow switch will be ON (relay closed) as long as pump is working and water flow to condenser is good. No flow, or impeded flow, will cause flow switch contacts to open (OFF in E2), which will generate an alarm, call for the pump to turn off, and discrete spray will turn on.
	Condenser Pump Proof	Current sensing relay	-	No relay closure	-	5 sec	-	-	When E2 calls for pump, contactor energizes. Current Sensing Relay closes. After 5 seconds, if CSR does not match E2, alarm is generated.
	Condenser Fan Proof	Current sensing relay	-	No relay closure	-	-	-	-	When E2 calls for a fan, contactor energizes. Current Sensing Relay closes. After 30 seconds, if CSR does not match E2, alarm is generated.
	Evap Condenser Pump	Always On	-	-	-	-	-	-	Condenser water temp must be above 34°, flow switch must be “ON” signaling good flow; pump will shut off if either of these are not ok.

Compressor Racks	Name	Input	Set point (Control point)	High Limit (trips)	High Alarm Delay (seconds or minutes)	Low Limit	Low Limit Delay (minutes)	Notes
Compressor Racks (All refrigerants except R744)	Compressors	Suction Transducer	Store Specific	8-12 psig above set point	60 min	8-12 psig below set point	60 min	When Floating Suction is programmed, set-point adjusts from design set-point to design +5-6 psig based on the temp of the designated lead circuit. As long as the lead circuit is "satisfied" set-point will adjust up in 1 pound increments. If the lead circuit is no longer satisfied, set-point is adjusted down in 1lb increments. The Float interval is 5 minutes. Floating suction is enabled after the store opens and only enabled on medium temperature RTCR's.
	Compressor Proof	Current sensing relay	-	No relay closure	35 min	-	-	When E2 calls for a compressor, contactor energizes Current Sensing Relay closes. After 35 minutes, if CSR does not match E2, alarm is generated.
	Compressor Oil fail	Dry contact	-	No relay closure	30 min	-	-	Alarm, compressor shut-down.
	Discharge Trip	Discharge Transducer	129 F	129 F	5 sec	-	-	All compressors shutdown off, and all condenser fans on.
	Mechanical Sub-cooler	Sub-cooler in-let temp	CI 45 F, CO 35 F	-	-	-	-	Control of liquid feeding electronic expansion valve.
	Mechanical Subcooling Lockout	Sub-cooler out-let temp	CI 34 F, CO 35 F	-	-	-	-	Control of the Sub-cool Controller board "pump-down".
	Mechanical Sub-cooling CDS/TXV (existing PUC design)	Sub-cooler liquid out temp	40 F	-	-	-	-	
	Receiver Liquid Level	Receiver float	-	100%	60 min	5%	60 min	Alarm only
	High Low Bypass	0-500 lb. Transducer	-	48 F	5 min	-	-	Alarm only. Note: for FMOC Ultrasite alarm purposes- In Ultrasite, high alarm value is 100 for R404a, 43 for R134a, and 85 for R407a.
	Rupture Disk	0-500 lb. Transducer	-	15 psig : R134a, 50 psig: R404A, 71 psig: R407A	10 min	-	-	Alarm only

Compressor Racks	Name	Input	Set point (Control point)	High Limit (trips)	High Alarm Delay (seconds or minutes)	Low Limit	Low Limit Delay (minutes)	Notes
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Compressor Racks (R744a) Sub-Critical	Compressors	Suction Transducer	-	315 psi	-	160 psi Pump-down	-	Pressure and Temperature ranges will be entered for all set-point data based on refrigeration schedule R1
	Compressor Proof CO2 LT Compressors	Current sensing relay	-	No relay closure	-	-	-	Summation of all compressor proof fails Immediate CO2 Main Liquid Line Shut-down
	Compressor Proof MT Compressors	Current sensing relay	-	No relay closure	-	-	-	Summation of all compressor proof fails Immediate CO2 Main Liquid Line Shut-down
	Condenser Evaporator	Dixell Controlled						Based on design
	Discharge Trip	Discharge psi 0-650 lb. Transducer	Variable 450 - 550 psig Alarm	-	5 sec	-	-	All compressors shutdown off, Immediate Main Liquid Line Shut-down
	LT CO2 Suction Pressure Trip Set-point	Suction psi 0-500 lb. Transducer	High 315 psig Low 160 psig	-	5 sec	-	-	Alarm suction group shut down
	MT High Suction Pressure Shut-down	MT Suction psi 0-200 lb. transducer	CI 20 psig, CO 17 psig	-	1 min	-	-	Alarm suction group shut down
	Receiver Liquid Probe	Receiver Electronic Probe	-	-	15 min notice	5%	-	CO2 Receiver Liquid Level 15% Warning 5% Alarm
	Receiver Liquid Float	Receiver Electronic Float	-	-	15 min notice	5%	-	CO2 Receiver Liquid Level 15% Warning 5% Alarm
	Receiver Liquid Level	Receiver Electronic Eye	-	-	15 min notice	5%	-	CO2 Receiver Liquid Level 15% Warning 5% Alarm

Compressor Racks (R744a) Trans-Critical	LT Compressors	Suction Transducer	-	285 psi	-	-	-	Pressure and Temperature ranges will be entered for all set-point data based on refrigeration schedule R1
	MT Compressors			565 psi	-	-	-	
	Compressor Proof CO2 LT Compressors	Current sensing relay	-	No relay closure	-	-	-	Summation of all compressor proof fails Immediate CO2 Main Liquid Line Shut-down
	Compressor Proof MT Compressors	Current sensing relay	-	No relay closure	-	-	-	Summation of all compressor proof fails Immediate CO2 Main Liquid Line Shut-down
	Gas Cooler Adiabatic	Based on Manufacturer						

	Discharge Trip	Discharge psi 0-650 lb. Transducer	520 psig Alarm	-	5 sec	-	-	All compressors shutdown off, Immediate Main Liquid Line Shut-down
	MT CO2 Suction Pressure Trip Set-point LT CO2 Suction Pressure Trip Set-point	Suction psi 0-500 lb. Transducer	High 565 Low 300 psig High 285 Low 140 psig	-	5 sec-	-	-	Alarm
	Receiver Liquid Probe	Receiver Electronic Probe	-	-	15 min notice	5%	-	CO2 Receiver Liquid Level 15% Warning 5% Alarm
	Receiver Liquid Float	Receiver Electronic Float	-	-	15 min notice	5%	-	CO2 Receiver Liquid Level 15% Warning 5% Alarm
	Receiver Liquid Level	Receiver Electronic Eye	-	-	15 min notice	5%	-	CO2 Receiver Liquid Level 15% Warning 5% Alarm

Walk In Unit Values	Door Switch	Door switch control panel	-	Open door	35 min	-	-	When door open, suction valve and liquid line solenoid close (freezer only). Strobe light flashes when door open. If door open more than 15 minutes, horn sounds. After 35 minutes, alarm is generated to FMOC.
	Door never opens alarm	Door switch control panel	-	Door unopened	48 hours or more	-	-	If door is showing unopened over 48 hours, alarm comes into FMOC. This is a sign there may be something wrong with door switch. Typically door should be open more often with deliveries, stocking, etc. This was implemented in new and MR/RS stores starting in 2014, but will not be done retroactively at existing locations.
	*Industry standard is 100 ppms for Leak Transducers, but high alarm limits may reflect different values in Ultrasite depending on Refrigerant type.							
	R-404A	Leak Transducer	-	*65	No Delay	-	-	If Refrigerant Leak Transducer reaches high alarm limit: Alarm generated to FMOC, W/I box will shut down, Refrigerant Leak Indicators energize, and the front office enunciator energizes. All will return to normal once falls below alarm limit. Alarm needs to be acknowledged in the Einstein.
	R-134A	Leak Transducer	-	*250	No Delay	-	-	
	R-407A	Leak Transducer	-	*100	No Delay	-	-	
	R-448A / R-449A	Leak Transducer	CI 500, CO 450	100	10 min.	-	-	If the Refrigerant Leak sensor reaches 100 ppm, an alarm will be generated to FMOC, Refrigerant Leak Indicators energize, (alarm silences and resets when level drops to 50 ppm, alarm must be acknowledged) and front office enunciator energizes. At 500 ppm the box LLS will be shut down, resets when ppm level drops to 450. Horn will remain on until the front office alarm panel is silenced.
	R-744 EMC Leak Detection	Leak Transducer	-	*2000	No Delay	-	-	If Refrigerant Leak Transducer reaches high alarm limit: Alarm generated to FMOC, W/I box will shut down, Refrigerant Leak Indicators energize, and the front office enunciator energizes. All will return to normal once falls below alarm limit. Alarm needs to be acknowledged in the Einstein.
Walk In Unit Values	IRLDS Leak Detection	Infrared Leak Detection System		*750	10 min.	-	-	If the Refrigerant Leak sensor reaches 750 ppm, an alarm will be generated to FMOC, the box will shut down, and the Refrigerant Leak Indicators energize. All will return to normal once ppm falls below 745 ppm. Horn will remain on until the front alarm panel is silenced.

P Fresh Refrigeration Guidelines

Checklists:

Compressor Rack R404A Settings

Yes or No		Description
RTCR A	RTCR B	
		Condenser fan (THIS IS THE CURRENT REMS SETTING) 190 psi (Hot Gas Defrost) 150 psi (Electric Defrost)
		Minimum condensing pressure 160 PSIG (75F)
		Hold back 150 PSIG (70F) (10 PSIG LESS THAN MINIMUM CONDENSING)
		Receiver pressure 140 PSIG (65F) 10 PSIG LESS THAN HOLD BACK VALVE)
		Split 60F (THIS IS CURRENT REMS SETTING for Pressure Control)
		Split 50F (THIS IS CURRENT REMS SETTING for Floating Condensing Control)
		Un-split 240 PSIG (THIS IS CURRENT REMS SETTING)
		Fast recovery 300 PSIG (THIS IS CURRENT REMS SETTING) 117F
		Mechanical HPS 350 PSIG
		Mechanical LPS -20 degree (16 PSIG REMS SETPOINT) / on @ 10 PSIG / off @ 3 PSIG / stage up time Stage 1 0-1 seconds, all remaining stages 30 seconds
		Mechanical LPS +18 degree (54 PSIG REMS SETPOINT) / on @ 45 PSIG / off @ 38 PSIG / stage up time delay Stage 1 0-1 seconds, all remaining stages 30 seconds
		Mechanical condenser fan switches (if equipped) to operate in the range: CUT IN 190-200-210 PSIG / CUT OUT 170-180-190 PSIG (MECHANICAL PRESSURE CONTROLS HAVE TO MAKE FOR REMS RELAYS TO WORK).
		Defrost differential valve 20-25 PSIG (nothing in defrost) (10 PSIG compensation for liquid lift).
		Receiver heater set-points On @ 45 F Off @ 50 F (use receiver outlet temp).
		Sub-cooling mechanical EPR – Set to 65 psig (30 F evaporator temperature – adjust as required to maintain 40 F exiting liquid temperature from sub-cooler).
		<u>Sporlan Sub-cool Controller</u>

		Sub-cooler Return Gas High Limit: 120 F
		Sub-cooler OFF Temperature Differential : 10 F
		Superheat Set point : 10 F
		Refrigerant – System dependent
		Liquid Proportional Gain set-point :1.0
		Liquid Integral Gain set-point : 60
		Liquid Derivative Gain set-point : 0
		Superheat Proportional Gain set-point :1.0
		Superheat Integral Gain set-point :120
		Superheat Derivative Gain set-point : 0
		Low Superheat Integral Gain :10
		Valve Steps – 1596 (valve type/size: SE-.5, SEI-1, SER-1.5, SEI-2, SEI-3.5, SEI-6, SER-6, SEI-11, SER-11, SER-20).
		Valve Steps – 2500 (valve type/size: SER-B, C, D, G, J, K, L).
		Valve Steps – 3193 (valve type/size: SEI-30).
		Valve Steps – 6386 (valve type/size: SEI-50, SHE-100, SHE-175).
		Evaporative Condenser Fan set-points 25 F above wet bulb, minimum 78 F, and maximum 110 F. (THIS IS THE CURRENT REMS SETTING)
		Evaporative Condenser Fan Fast Recovery 300 PSI. (THIS IS THE CURRENT REMS SETTING)
		Evaporative Condenser Pump set-points, sump temp above 34 F pump on. (THIS IS THE CURRENT REMS SETTING)
		Evaporative Condenser Discrete Spray set-point, pump proof fail, discrete spray on. (THIS IS THE CURRENT REMS SETTING)
		Evaporative Condenser Loss of Flow set-point, loss of flow, pump off. (THIS IS THE CURRENT REMS SETTING)

Sub-cooler Note: Rack is supplied with a liquid sub cooler. Refrigerant from the main liquid line feeds sub cooling circuit with Sporlan Sub-cooler Controller controlling a Sporlan electronic expansion valve (EEV). On suction side of sub cooling circuit a mechanical evaporator pressure regulating valve is provided to maintain a set evaporator pressure for sub-cooler operation. Suction gas is used then for vapor injection of Copeland Scroll compressors.

Reciprocating compressor racks: Medium temp RTCR is designed to sub-cool low temp RTCR liquid.

Condensing Unit R404A Settings

Yes or No	Description
	Condenser fan (s) turn on 235 PSIG / turn off 190 PSIG (multiple fans stage every 10 PSI)
	Head pressure control set 180 PSIG)
	Liquid De-superheating TEV set at 40 degrees F at center of valve swing.
	High Pressure Switch setting 350 PSIG
	Low temperature Low Pressure Switch - set to maintain -10 degree F box temperature Food Avenue Freezer -5F
	Medium temperature Low Pressure Switch - set to maintain the following box temperatures – Meat +28F Dairy +34F Produce +34F Dry Storage +58F Food Ave Cooler +34F (COPELAND ZB SCROLL MINIMUM SUCTION PRESSURE IS 17 PSIG)

Condensing Unit R404A Settings with Hot Gas Bypass

Yes or No	Description
	Hot Gas Bypass Dual Temp. Set valve to open when suction PSI falls below 15 PSIG.
	Hot Gas Bypass Med Temp. Set valve to open when suction PSI falls below 50 PSIG.
	Crankcase Pressure Regulator valve Low Temp. Set to throttle compressor suction pressure @ 30-35 PSIG. Set valve immediately after start-up when evaporator is close to room temp.
	Crankcase Pressure Regulating valve Med Temp. Set to throttle compressor suction pressure @ 80-85 PSIG. Set valve immediately after start-up when evaporator is close to room temp.
	Dual Temp Low Pressure Switch set to maintain case low temperature set-point

Condensing Unit R448A/R449A Settings

Yes or No	Description
	Condenser fan (s) turn on 225 PSIG / turn off 177 PSIG (multiple fans stage every 10 PSI)
	Head pressure control set 167 PSIG)
	Liquid De-superheating TEV set at 40 degrees F at center of valve swing.
	High Pressure Switch setting 350 PSIG
	Low temperature Low Pressure Switch - set to maintain -10 degree F box temperature Food Avenue Freezer -5F
	Medium temperature Low Pressure Switch - set to maintain the following box temperatures – Meat +28F Dairy +34F Produce +34F Dry Storage +58F Food Ave Cooler +34F (COPELAND ZB SCROLL MINIMUM SUCTION PRESSURE IS 17 PSIG)

Condensing Unit R448A/R449A Settings with Hot Gas Bypass

Yes or No	Description
	Hot Gas Bypass Dual Temp. Set valve to open when suction PSI falls below 15 PSIG.
	Hot Gas Bypass Med Temp. Set valve to open when suction PSI falls below 50 PSIG.
	Crankcase Pressure Regulator valve Low Temp. Set to throttle compressor suction pressure @ 30-35 PSIG. Set valve immediately after start-up when evaporator is close to room temp.
	Crankcase Pressure Regulating valve Med Temp. Set to throttle compressor suction pressure @ 80-85 PSIG. Set valve immediately after start-up when evaporator is close to room temp.
	Dual Temp Low Pressure Switch set to maintain case low temperature set-point

Rooftop Compressor Rack R134A Settings (if applicable)

Yes or No	Description
	Condenser fan 95 PSIG
	Minimum condensing pressure 78 PSIG (75F)
	Hold back 71 PSIG (70F)
	Receiver pressure 65 PSIG (65F)
	Split 60F (THIS IS CURRENT REMS SETTING)
	Un-split 125 PSIG
	Fast recovery 165 PSIG (117F)
	Mechanical HPS 195 PSIG
	Mechanical LPS +22 degree (20 PSIG REMS SETPOINT) / on @ 22 PSIG / off @ 18 PSIG / stage up time delay Stage 1 0-1 seconds, all remaining stages 30 seconds
	Mechanical condenser fan switches (if equipped) to operate in the range: CUT IN 115, 125, and 135 PSIG / CUT OUT 100, 110, 120 PSIG (MECHANICAL PRESSURE CONTROLS HAVE TO MAKE FOR REMS RELAYS TO WORK).

Rooftop Compressor Rack R513A Settings (if applicable)

Yes or No	Description
	Condenser fan 95 PSIG
	Minimum condensing pressure 78 PSIG (75F)
	Hold back 71 PSIG (70F)
	Receiver pressure 65 PSIG (65F)
	Split 60F (THIS IS CURRENT REMS SETTING)
	Un-split 125 PSIG

	Fast recovery 165 PSIG (117F)
	Mechanical HPS 195 PSIG
	Mechanical LPS +22 degree (20 PSIG REMS SETPOINT) / on @ 22 PSIG / off @ 18 PSIG / stage up time delay Stage 1 0-1 seconds, all remaining stages 30 seconds
	Mechanical condenser fan switches (if equipped) to operate in the range: CUT IN 115, 125, and 135 PSIG / CUT OUT 100, 110, 120 PSIG (MECHANICAL PRESSURE CONTROLS HAVE TO MAKE FOR REMS RELAYS TO WORK).

RTCR Compressor Rack CO2 Lower Cascade (R-744) Settings

Yes or No	Description
	Low Side Operating Range 200 – 275 psig @ -20 evaporator design
	Low Suction Alarm Set-point <160 psig
	High Suction Alarm Set-point >315 psig
	High Side Operating Range 400 – 500 psig
	Low Discharge Alarm Set-point < 400 psig
	High Discharge Alarm Set-point > 500 psig
	Discharge Safety Trip 510 psig CI, Reset 475 psig
	Pressure Regulating Relief Valve 560 psig
	Main Pressure Relief 625 psig
	Master Defrost Shutdown 500 Separator psig
	Compressor Max Low Side Relief 350 psig
	Compressor Mechanical LPS CO 150 psig, Minimum Differential 58 psi
	Compressor Mechanical HPS CO 530 psig, Minimum Differential 58 psi
	Compressor Mechanical stage up time delays 30 seconds for first compressor, then 60s spread (30s, 90s, 150s...)
	<p>Main Liquid Solenoid Valve CO2: Valve shall close under any of the following conditions;</p> <ul style="list-style-type: none"> • ACU (auxiliary condensing unit is turned on (if applicable). • Main Liquid Line Solenoid Valve switch is turned off. • Rack experiences a Master Defrost Shutdown. • Rack Phase Loss. • Controller out-put opens (out-put shall open when all CO2 compressors are in oil or proof fault condition.
	<p>Main Liquid Line Solenoid Valve HFC: Valve shall close under any of the following conditions;</p> <ul style="list-style-type: none"> • Controller out-put opens (out-put shall open when all HFC compressors are in oil or proof fault condition. • Rack Phase Loss. • HFC Main Liquid Line Solenoid Valve switch is turned off. • CO2 discharge pressure falls below 290 psig.

	Air Cooled De-superheater CI 35 CO 30 deg F Ambient Temperature
	CO2 Receiver Liquid Level 15% Warning 5% Alarm

*Note: The CO2 system currently utilizes the Smart Valve for subcooling and is not controlled by the E2 Controller.

CO2 Note: Refer to manufacturers Installation/Start-up/Operational manuals SNLTX2 and Second Nature Secondary Refrigerant documents for set-up, evacuation, charging, sequence of operations, and troubleshooting guides.

Compressor Rack R448A/R449A Settings (if applicable)

Yes or No		Description
Rack A	Rack B	
		Condenser fan 177 PSIG (85 F Midpoint)
		Minimum condensing pressure 154 PSIG (75 F Midpoint)
		Hold back 140 PSIG (70 F Midpoint)
		Receiver pressure 128 PSIG (65 F Midpoint)
		Split 60F (THIS IS CURRENT REMS SETTING for Pressure Control)
		Split 50F (THIS IS CURRENT REMS SETTING for Floating Condensing Control)
		Un-split 210 PSIG (94 F)
		Fast recovery 300 PSIG (117 F)
		Mechanical HPS 330 PSIG (130 F)
		Mechanical LPS -20 degree on @ 2 PSIG below REMS / off @ 3 PSIG / stage up time stage up time delay, Stage 1 0-1 seconds, all remaining stages 30 seconds
		Mechanical LPS +18 degree (48 PSIG REMS SETPOINT) / on @ 38 PSIG / off @ 28 PSIG / stage up time delay, Stage 1 0-1 seconds, all remaining stages 30 seconds
		Mechanical condenser fan switches (if equipped) to operate in the range: CUT IN 165-180-195 PSIG / CUT OUT 150-165-180 PSIG (MECHANICAL PRESSURE CONTROLS HAVE TO MAKE FOR REMS RELAYS TO WORK).

Super Target Refrigeration Guidelines

Checklists:

Compressor Rack R404A Settings

Yes or No		Description
Rack A	Rack B	
		Condenser fan 190 PSIG (THIS IS THE CURRENT REMS SETTING)
		Minimum condensing pressure 160 PSIG (75F)
		Hold back 150 PSIG (70F) (10 PSIG LESS THAN MINIMUM CONDENSING)
		Receiver pressure 140 PSIG (65F) (10 PSIG LESS THAN HOLD BACK VALVE)
		Split 60F (THIS IS CURRENT REMS SETTING for Pressure Control)
		Split 50F (THIS IS CURRENT REMS SETTING for Floating Condensing Control)
		Un-split 240 PSIG (THIS IS CURRENT REMS SETTING)
		Fast recovery 300 PSIG (THIS IS CURRENT REMS SETTING) 117F
		Mechanical HPS 350 PSIG
		Mechanical LPS -28 degree on @ 2 PSIG below REMS / off @ 3 PSIG / stage up time delays stage up time delay, Stage 1 0-1 seconds, all remaining stages 30 seconds
		Mechanical LPS +18 degree on @ 9 PSIG below REMS/ off @ 38 PSIG / stage up time delay stage up time delay, Stage 1 0-1 seconds, all remaining stages 30 seconds
		Mechanical condenser fan switches (if equipped) to operate in the range: CUT IN 190-200-210 PSIG / CUT OUT 170-180-190 PSIG (MECHANICAL PRESSURE CONTROLS HAVE TO MAKE FOR REMS RELAYS TO WORK).
		Defrost differential valve 20-25 PSIG (nothing in defrost) (10 PSIG compensation for liquid lift).
		Sub-cooling mechanical EPR – Set to 65 psig (30 F evaporator temperature – adjust as required to maintain 40 F existing liquid temperature from sub-cooler).
		<u>Subcoolomatic Controller:</u>
		Sub Cooled Liquid Temperature (LQSP): 40 F liquid temperature exiting
		Superheat set point :10 F
		Refrigerant : System dependent
		Valve size : “SMAL”
		Derivative set-point : 0

		Proportional gain set-point :10
		Integral set-point : 10
		<u>Sporlan Sub-cool Controller:</u>
		Sub Cooled Liquid Outlet Temperature Set-point (LoSP) : 40 F liquid temperature exiting
		Sub-cooler Return Gas High Limit: 120 F
		Sub-cooler OFF Temperature Differential : 10 F
		Superheat Set point : 10 F
		Refrigerant : System Dependent
		Liquid Proportional Gain set-point: 1
		Liquid Integral Gain set-point: 60
		Liquid Derivative Gain set-point: 0
		Superheat Proportional Gain set-point : 10
		Superheat Integral Gain set-point : 120
		Superheat Derivative Gain set-point: 0
		Low Superheat Integral Gain : 10
		Valve Steps – 1596 (valve type/size: SE-.5, SEI-1, SER-1.5, SEI-2, SEI-3.5, SEI-6, SER-6, SEI-11, SER-11, SER-20).
		Valve Steps – 2500 (valve type/size: SER-B, C, D, G, J, K, L).
		Valve Steps – 3193 (valve type/size: SEI-30).
		Valve Steps – 6386 (valve type/size: SEI-50, SHE-100, SHE-175).
		Evaporative Condenser Fan set-points 25 F above wet bulb, minimum 78 F, and maximum 110 F. (THIS IS THE CURRENT REMS SETTING)
		Evaporative Condenser Fan Fast Recovery 300 PSI. (THIS IS THE CURRENT REMS SETTING)
		Evaporative Condenser Pump set-points, sump temp above 34 F pump on. (THIS IS THE CURRENT REMS SETTING)
		Evaporative Condenser Discrete Spray set-point, pump proof fail, discrete spray on. (THIS IS THE CURRENT REMS SETTING)
		Evaporative Condenser Loss of Flow set-point, loss of flow, pump off. (THIS IS THE CURRENT REMS SETTING)

Sub-cooler Note: Rack is supplied with a liquid sub cooler. Refrigerant from the main liquid line feeds sub cooling circuit with Sporlan Sub-cooler Controller controlling a Sporlan electronic expansion valve (EEV). On suction side of sub cooling circuit a mechanical evaporator pressure regulating valve is provided to maintain a set evaporator pressure for sub-cooler operation. Suction gas is used then for vapor injection of Copeland Scroll compressors. **Reciprocating compressor racks:** Medium temp RTCR is designed to sub-cool low temp RTCR liquid.

Condensing Unit R404A Settings

Yes or No	Description
	Condenser fan (s) turn on 235 PSIG / turn off 190 PSIG (multiple fans stage every 10 PSI)
	Head pressure control set 180 PSIG)
	Liquid De-superheating TEV set at 40 degrees F at center of valve swing.
	High Pressure Switch setting 350 PSIG
	Low temperature Low Pressure Switch - set to maintain -10 degree F box temperature
	Medium temperature Low Pressure Switch - set to maintain the following box temperatures – Meat +28F Dairy +34F Produce +34F Dry Storage +58F Food Ave Cooler +34F Food Avenue Freezer -5F (COPELAND ZB SCROLL MINIMUM SUCTION PRESSURE IS 17 PSIG)

Condensing Unit R404A Settings with Hot Gas Bypass

Yes or No	Description
	Hot Gas Bypass Dual Temp. Set valve to open when suction PSI falls below 15 PSIG.
	Hot Gas Bypass Med Temp. Set valve to open when suction PSI falls below 50 PSIG.
	Crankcase Pressure Regulator valve Low Temp. Set to throttle compressor suction pressure @ 30-35 PSIG. Set valve immediately after start-up when evaporator is close to room temp.
	Crankcase Pressure Regulating valve Med Temp. Set to throttle compressor suction pressure @ 80-85 PSIG. Set valve immediately after start-up when evaporator is close to room temp.
	Dual Temp Low Pressure Switch set to maintain case low temperature set-point

Condensing Unit R448A/R449A Settings

Yes or No	Description
	Condenser fan (s) turn on 225 PSIG / turn off 177 PSIG (multiple fans stage every 10 PSI)
	Head pressure control set 167 PSIG)
	Liquid De-superheating TEV set at 40 degrees F at center of valve swing.
	High Pressure Switch setting 350 PSIG
	Low temperature Low Pressure Switch - set to maintain -10 degree F box temperature Food Avenue Freezer -5F

	Medium temperature Low Pressure Switch - set to maintain the following box temperatures – Meat +28F Dairy +34F Produce +34F Dry Storage +58F Food Ave Cooler +34F (COPELAND ZB SCROLL MINIMUM SUCTION PRESSURE IS 17 PSIG)
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Condensing Unit R448A/R449A Settings with Hot Gas Bypass

Yes or No	Description
	Hot Gas Bypass Dual Temp. Set valve to open when suction PSI falls below 15 PSIG.
	Hot Gas Bypass Med Temp. Set valve to open when suction PSI falls below 50 PSIG.
	Crankcase Pressure Regulator valve Low Temp. Set to throttle compressor suction pressure @ 30-35 PSIG. Set valve immediately after start-up when evaporator is close to room temp.
	Crankcase Pressure Regulating valve Med Temp. Set to throttle compressor suction pressure @ 80-85 PSIG. Set valve immediately after start-up when evaporator is close to room temp.
	Dual Temp Low Pressure Switch set to maintain case low temperature set-point

Compressor Rack R407A Settings (if applicable)

Yes or No		Description
Rack A	Rack B	
		Condenser fan 177 PSIG (85 F Midpoint)
		Minimum condensing pressure 150 PSIG (75 F Midpoint)
		Hold back 138 PSIG (70 F Midpoint)
		Receiver pressure 127 PSIG (65 F Midpoint)
		Split 60F (THIS IS CURRENT REMS SETTING for Pressure Control)
		Split 50F (THIS IS CURRENT REMS SETTING for Floating Condensing Control)
		Un-split 224 PSIG 100 F Midpoint
		Fast recovery 300 PSIG 117F Midpoint
		Mechanical HPS 342 PSIG 130 F Midpoint
		Mechanical LPS -20 degree on @ 2 PSIG below REMS / off @ 3 PSIG / stage up time stage up time delay, Stage 1 0-1 seconds, all remaining stages 30 seconds
		Mechanical LPS +22 degree (43 PSIG REMS SETPOINT) / on @ 38 PSIG / off @ 28 PSIG / stage up time delay stage up time delay, Stage 1 0-1 seconds, all remaining stages 30 seconds
		Mechanical condenser fan switches (if equipped) to operate in the range: CUT IN 165-180-195 PSIG / CUT OUT 150-165-180 PSIG (MECHANICAL PRESSURE CONTROLS HAVE TO MAKE FOR REMS RELAYS TO WORK).

Compressor Rack R448A/R449A Settings (if applicable)

Yes or No		Description
Rack A	Rack B	
		Condenser fan 177 PSIG (85 F Midpoint)
		Minimum condensing pressure 154 PSIG (75 F Midpoint)
		Hold back 140 PSIG (70 F Midpoint)
		Receiver pressure 128 PSIG (65 F Midpoint)
		Split 60F (THIS IS CURRENT REMS SETTING for Pressure Control)
		Split 50F (THIS IS CURRENT REMS SETTING for Floating Condensing Control)
		Un-split 210 PSIG (94 F)
		Fast recovery 300 PSIG (117 F)
		Mechanical HPS 330 PSIG (130 F)
		Mechanical LPS -20 degree on @ 2 PSIG below REMS / off @ 3 PSIG / stage up time stage up time delay, Stage 1 0-1 seconds, all remaining stages 30 seconds
		Mechanical LPS +18 degree (48 PSIG REMS SETPOINT) / on @ 38 PSIG / off @ 28 PSIG / stage up time delay, Stage 1 0-1 seconds, all remaining stages 30 seconds
		Mechanical condenser fan switches (if equipped) to operate in the range: CUT IN 165-180-195 PSIG / CUT OUT 150-165-180 PSIG (MECHANICAL PRESSURE CONTROLS HAVE TO MAKE FOR REMS RELAYS TO WORK).

Super Target's with Remote Headers: Due to pressure drop with R448 & R449, the condensing set-point at 85F will not provide adequate liquid pressure to maintain case temperature. Because of this pressure drop the condensing set-point will vary depending on system characteristics. The condensing set-point shall be determined by Target Refrigeration Authority (TRA) or Target Refrigeration Operations Technical Lead (TL)

Superheat and Thermostatic Expansion Valve Adjustment Process

- ☐ Setting expansion valves is critical to the performance of a refrigeration system. Refrigeration Technician shall be prepared to execute the following steps in a slow, thorough and measured manner.
- ☐ Superheat shall only be measured with all evaporator covers, case bottom pans and cooler/freezer doors closed as applicable to case or evaporator coil under adjustment and evaluation.
- ☐ Top off receiver refrigerant level to 40% as required. Monitor receiver refrigerant level as the TXV adjustment progresses (additional refrigerant may be required to maintain the 40% level).
- ☐ Elevate the suction manifold so it is 5° F above the design saturated suction temperature (SST) of the warmest evaporator temperature line-up on the rack by manually toggling a combination of compressor horsepower off. THIS PROCEDURE PREVENTS COMPRESSOR CYCLING during the thermostatic expansion valve adjustment.
- ☐ Set all expansion valves of the warmest line-up first.
- ☐ Set all expansion valves on the next coldest line-up, using same method as with the warmest circuit.
- ☐ Set each low temperature evaporator superheat at 6° F, at the center of valve swing.
- ☐ Set each medium temperature evaporator superheat at 8° F, at the center of the valve swing.

NOTE: While setting superheats, the refrigerant charge MUST be monitored continuously. If the refrigerant levels at the receiver drop below 20% while setting superheats, expansion valve settings must be rechecked.

Anti-sweat Heaters: P Fresh, City, Super, and P&G Stores

The glass door frozen food cases that Target uses in the market area of P-stores, P Fresh, and within the grocery area of a Super Targets are equipped with anti-sweat heaters on the doors and door frames. These heaters are factory installed and are designed to warm the glass and metal surfaces of the door and door frame to prevent the formation of condensation.

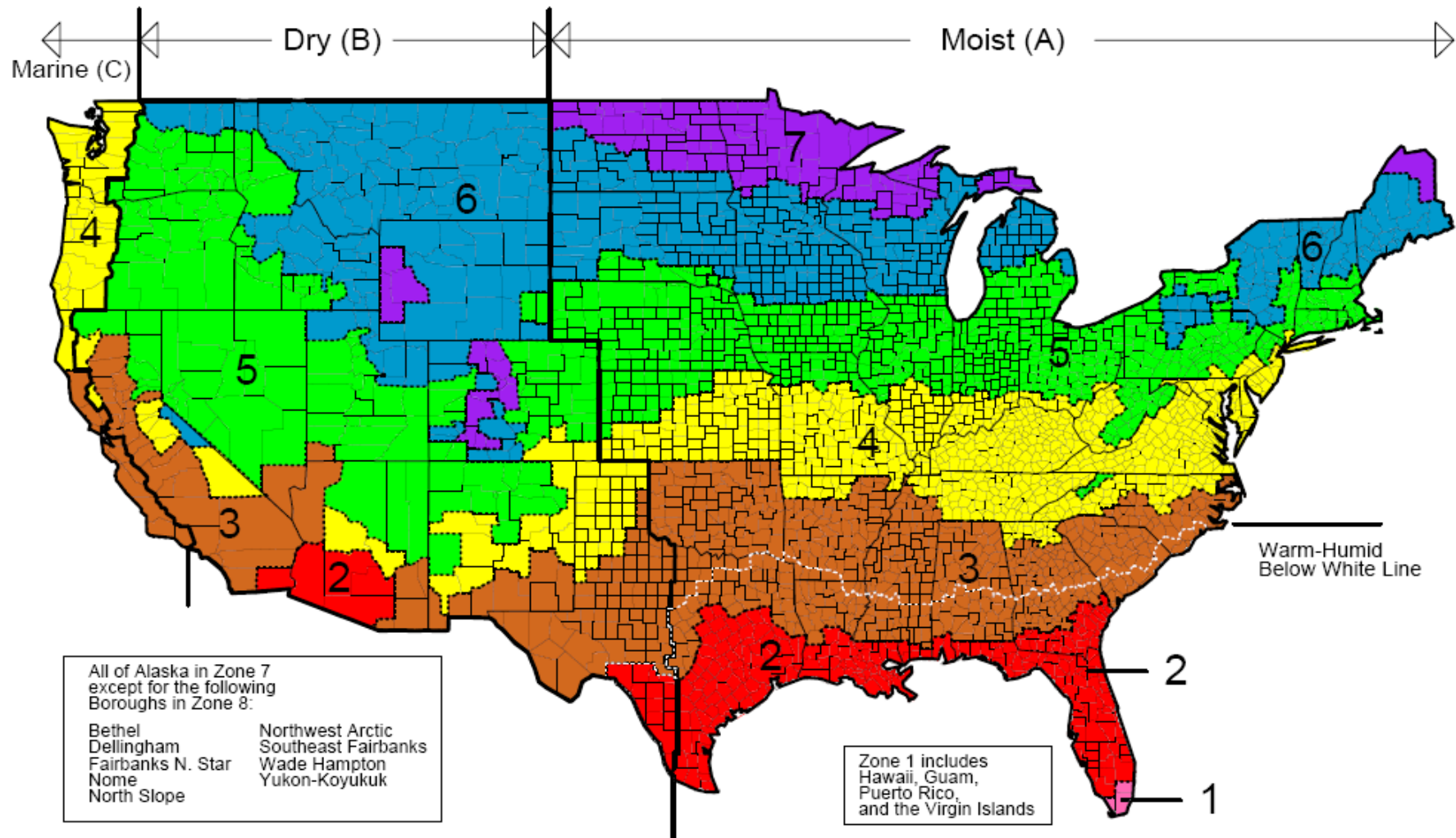
Target uses a strategy through one of the energy management systems to control the anti-sweat heaters based on store dew point temperature. During periods of low dew point, less energy is required to prevent condensation from forming. This is why Target's control system periodically cycles the anti-sweat heaters on or off to maintain a door, glass and frame temperature that is above the store dew point.

Target's control set points for the anti-sweat heaters are shown below.

DOE Climate Zone	All On (Dew point setting)	All On (%)	All Off (Dew point setting)	All Off (%)
Zone 1A	58° F	100%	35° F	15%
Zone 2A	58° F	100%	35° F	15%
Zone 2B	60° F	100%	35° F	15%
Zone 3A	58° F	100%	35° F	15%
Zone 3B	60° F	100%	35° F	15%
Zone 3C	60° F	100%	35° F	15%
Zone 4A	60° F	100%	35° F	15%
Zone 4B	60° F	100%	35° F	15%
Zone 4C	60° F	100%	35° F	15%
Zone 5A	60° F	100%	35° F	15%
Zone 5B	60° F	100%	35° F	15%
Zone 6A	60° F	100%	35° F	15%
Zone 6B	60° F	100%	35° F	15%
Zone 7A	60° F	100%	35° F	15%
Zone 7B	60° F	100%	35° F	15%
Zone 7C	60° F	100%	35° F	15%
Row 8D	60° F	100%	35° F	15%

Domestic: Map of DOE's Climate Zones

Map of DOE's Proposed Climate Zones



March 24, 2003