

### CONDENSER AND RECEIVER OPERATION

CONDENSER CONTROL: THE CONDENSER CONTROL STRATEGY EMPLOYS AN AMBIENT TEMPERATURE (DRY BULB) DIFFERENTIAL TRACKING APPROACH THAT RESETS THE SATURATED CONDENSING TEMPERATURE CONTROL SETPOINT (CSP). THE CONTROL ALGORITHMS AND THE INPUT/OUTPUT POINTS REQUIRED TO ACHIEVE CONDENSER FAN SPEED CONTROL AND CONDENSER CAPACITY SPLIT CONTROL SHALL RESIDE IN, AND BE A FUNCTION OF, THE MANUFACTURER PROVIDED CONTROLS. ALL CONDENSER CONTROL FUNCTION SHALL BE THE RESPONSIBILITY OF THE OEM.

AIR COOLED CONDENSERS SHALL APPLY A SINGLE VFD PER CONDENSER AND SHALL CONTROL THE SPEED OF ALL FANS COLLECTIVELY AS ONE COMMON VARIABLE FREQUENCY CONTROL. THE VFD SPEED COMMAND, FROM MINIMUM SPEED TO MAXIMUM SPEED, SHALL BE A FUNCTION OF AMBIENT DRY BULB TEMPERATURE SUCH THAT A CONSTANT TEMPERATURE DIFFERENCE (TD) IS MAINTAINED BETWEEN THE SATURATED CONDENSING TEMPERATURE AND AMBIENT TEMPERATURE. REFERENCE THE DX R407A EMS REFRIGERATION SETTINGS TABLE. THE LOWER LIMIT SHALL BE DETERMINED BY THE OEM. A FAN SPEED BYPASS MODE THAT OVERRIDES ALL FANS TO 100% SPEED AND AVAILABLE CAPACITY SURFACE AREA TO 100% SHALL BE INCLUDED. THE BYPASS MODE SHALL ENABLE THE CONDENSER FAN CONTROL(S) TO DISABLE THE VFD AND INITIATE A VFD BYPASS. THE BYPASS MODE IS INITIATED BY THE VFD FAULT. THE VFD BYPASS MODE OVERRIDES THE VFD BYPASS MODE IS INITIATED BY THE VFD FAULT.

SURGE RECEIVERS SHALL HAVE A NORMALLY CLOSED SURGE SOLENOID THAT SHALL OPEN WHEN THE DISCHARGE TEMPERATURE IS BELOW THE SURGE SOLENOID CUT-IN TEMPERATURE. THE SURGE SOLENOID SHALL CLOSE WHEN THE DISCHARGE TEMPERATURE IS ABOVE THE SURGE SOLENOID CUT-OUT TEMPERATURE DETERMINED BY THE OEM.

THE FOLLOWING RECEIVED ALARM EVENTS SHALL BE COMMUNICATED BY THE OEM CONTROL TO THE BAS: HIGH PRESSURE LOW LEVEL ALARM, RECEIVER DISCHARGE ALARM.

DEFROST EXPANSION VALVE CASE AND WALK-IN EVAPORATOR OPERATION DISCUSS TEMPERATURE CONTROL.

FIXTURES SHALL BE DEFINED AS REFRIGERATED DISPLAY CASES AND REFRIGERATED WALK-IN COOLER AND FREEZER COILS. CIRCUITS SHALL BE DEFINED AS A GROUP OF FIXTURES WHICH SHARE A COMMON SET OF TEMPERATURE CONTROL VALVES. EACH REFRIGERATION CIRCUIT SHALL HAVE A NORMALLY CLOSED LIQUID LINE SOLENOID VALVE (LLSV) AND ELECTRONIC PRESSURE REGULATOR (EPR) USED TO MAINTAIN CASE TEMPERATURE CONTROL (PARAMETERS).

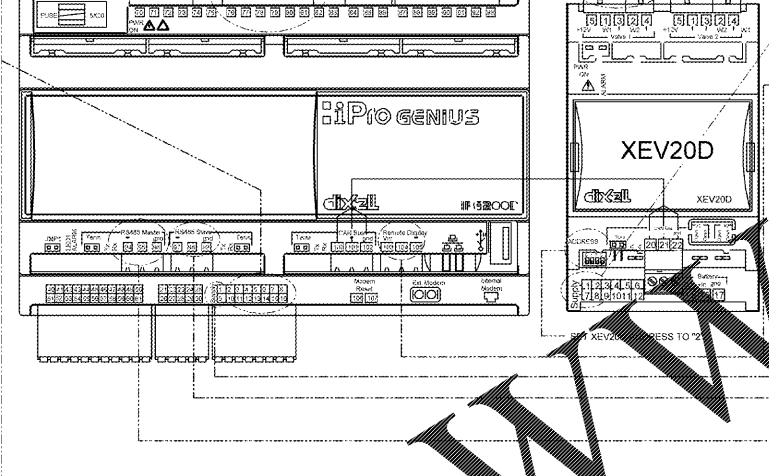
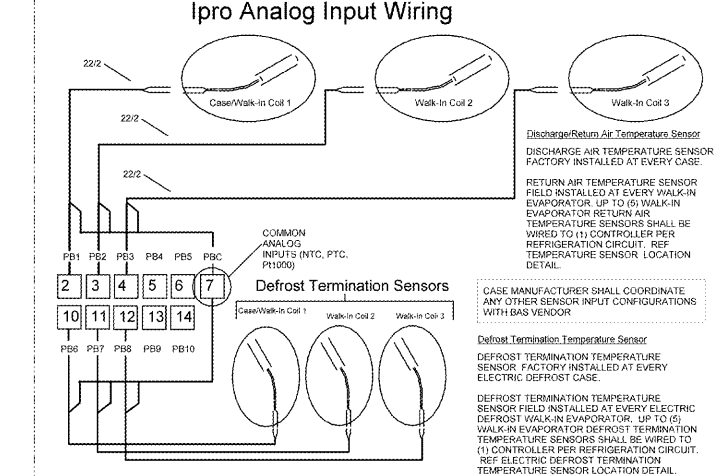
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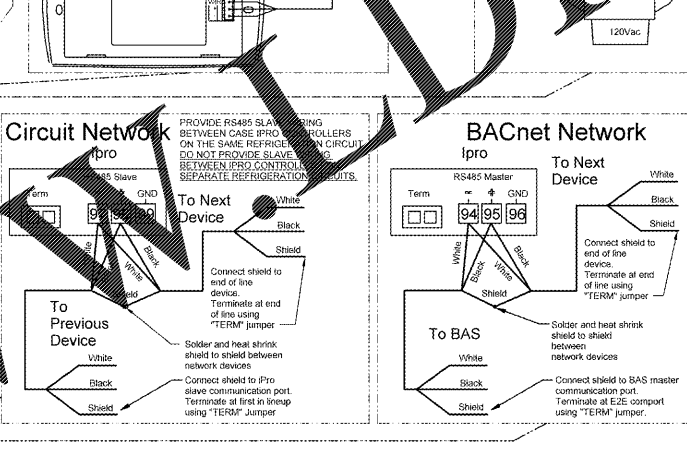
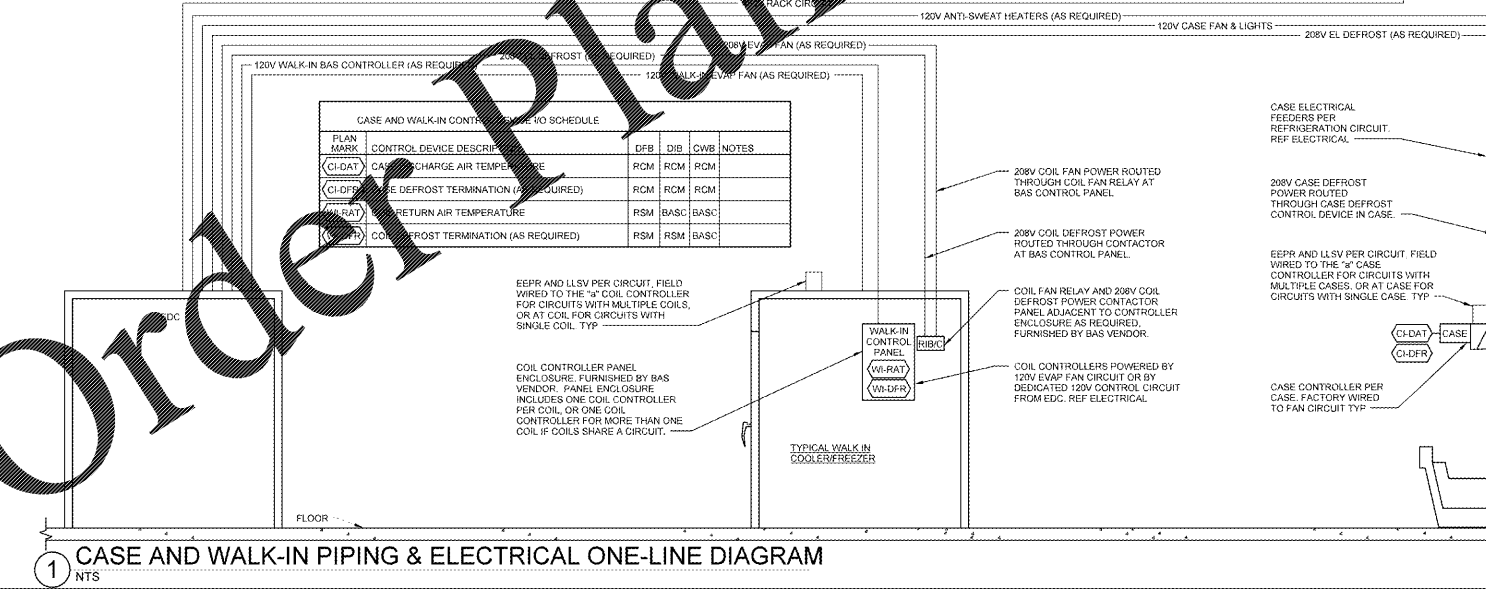
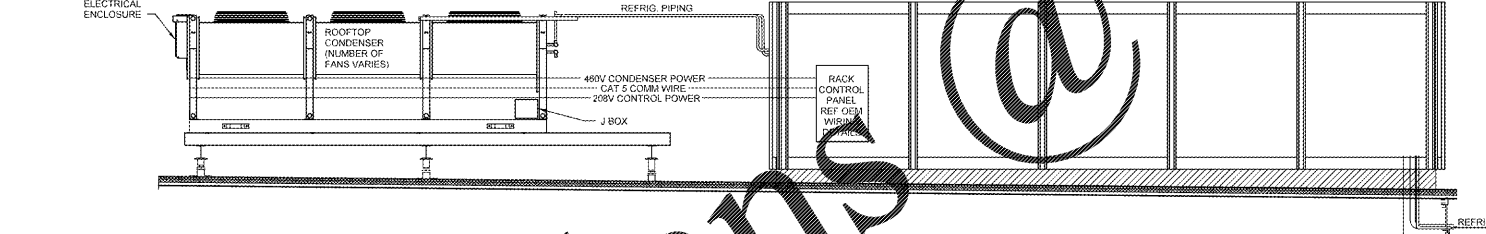
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OFF-CYCLE: WHEN A DEFROST EVENT IS INITIATED, VIA COMMAND FROM THE BAS, THE OFF-CYCLE DEFROST FOLLOWS THE SAME TIME TEMPERATURE SEQUENCES AS ELECTRIC DEFROST LESS THE INITIATION AND TERMINATION OF THE ELECTRIC DEFROST HEATERS. ALL FANS STAY ON CONTINUOUSLY THROUGH THE DEFROST EVENT.

FIXTURE LIGHTING CONTROL: LIGHTS SHALL BE CONTROLLED BY THE LOCAL CASE CONTROLLER AND GOVERNED BY A SCHEDULE RESIDING IN THE MAIN BAS CONTROLLER.



## 2 CASE AND WALK-IN CONTROLLER WIRING



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### BACK COMPRESSOR AND SUBCOOLER OPERATION

PRIMARY PARALLEL DX SYSTEM: THE COMPRESSORS SHALL BE STAGED TO ACHIEVE THE SUCTION PRESSURE CONTROL SETPOINT (CSP) AS DETERMINED BY THE OEM. THE COMPRESSOR STAGING CONTROL OPERATION AND RESPONSE SHALL PREVENT EXCESSIVE COMPRESSOR CYCLING (START/STOPS). EXCESSIVE COMPRESSOR CYCLING IS DEFINED AS MORE THAN 8 CYCLE EVENTS IN 60 MINUTES.

THE EQUIPMENT MANUFACTURER SHALL INDICATE WHICH COMPRESSORS/LOADERS ARE TO OPERATE IN WHAT ORDER FOR THE CORRECT STAGING CAPACITY. WHEN A VFD IS APPLIED FOR STAGING CAPACITY CONTROL, IT SHALL BE THE DEFAULT LEAD COMPRESSOR AND SHALL OPERATE CONTINUOUSLY WITHOUT CYCLING. EQUAL RUN TIME ALGORITHMS SHALL BE APPLIED TO SYSTEMS WITH EVENLY SIZED COMPRESSORS.

THE FOLLOWING ALARM EVENTS SHALL BE COMMUNICATED BY THE OEM CONTROLLER TO THE BAS AND SHALL CYCLE OFF THE COMPRESSORS: COMPRESSOR HIGH PRESSURE SWITCH, COMPRESSOR OIL FAILURE SWITCH, RACK PHASE LOSS.

SUBCOOLER: THE RACK OEM SHALL DETERMINE THE FUNCTIONAL CONTROL AND OPERATION OF THE SUB-COOLER AND ASSOCIATED COMPONENTS TO MAINTAIN THE SUBCOOLED LIQUID TEMPERATURE WITHIN THREE DEGREES OF TARGET.

LIQUID PRESSURE REGULATOR: LIQUID PRESSURE REGULATOR SHALL MAINTAIN A LIQUID SUPPLY PRESSURE WITHIN FIVE POUNDS OF THE TARGET.

### DEFROST CONTROL TABLE OF EVENTS

| MODE                 | APPLICATION                | SUPPLY SOLENOID VALVES | FANS                    | DEFROST HEATERS |
|----------------------|----------------------------|------------------------|-------------------------|-----------------|
| PUMP/OUT             | ALL                        | OFF                    | ON                      | OFF             |
| DEFROST CYCLE        | ELECTRIC DEFROST - CASE    | OFF                    | ON OR OFF, PER CASE OEM | ON              |
|                      | OFF-CYCLE DEFROST - CASE   | OFF                    | ON OR OFF, PER CASE OEM | N/A             |
|                      | ELECTRIC DEFROST - WALK-IN | OFF                    | OFF                     | ON              |
| DRIP TIME            | OFF-CYCLE - WALK-IN        | OFF                    | ON                      | OFF             |
|                      | ELECTRIC DEFROST - CASE    | OFF                    | ON OR OFF, PER CASE OEM | OFF             |
|                      | OFF-CYCLE DEFROST - CASE   | OFF                    | ON OR OFF, PER CASE OEM | N/A             |
| FAN DELAY            | ELECTRIC DEFROST - WALK-IN | OFF                    | OFF                     | OFF             |
|                      | OFF-CYCLE - WALK-IN        | OFF                    | OFF                     | N/A             |
| RESUME REFRIGERATION | AS REQUIRED                | ON                     | OFF                     | OFF             |
|                      | ALL                        | ON                     | ON                      | OFF             |

## Order Plans

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CONSULTANTS: **Wilson B. Kaney & Company, Inc.**  
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 STORE NO. 1904  
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**Walmart**  
 LEESBURG, VIRGINIA

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REFRIG ENERGY MANAGEMENT DETAILS  
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