



USER MANUAL

SCS Controller – Faults and Alarms

Document # AO197_i4 Issue date: June 2025

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Overview

The SCS Controller contains the following fault protection mechanisms:



Alarms with no codes

The following faults only display an alarm symbol on the SCS Controller screen:

- Door Fail
- Excessive Door Open Counts
- Over Voltage
- Under Voltage



This fault type is logged but does not typically impact product temperature. Minimal action (and sometimes 'no action') is needed by the storekeeper or site manager to resolve these alarm types.



Alarms with codes

The following faults display an alarm symbol **and** an alarm code on the SCS Controller screen:

- dor / ALr 1 - Door Left Open Alarm
- ALr 8 - Low Product Temperature
- ALr 9 - High Product Temperature
- ALr 14 - Condenser Overtemp
- ALr 15 - Excessive Condenser Overtemp**
- ALr 17 - NTC Failure
- ALr 19 - Refrigeration Fail
- ALr 20 - Return Air Under Temp
- ALr 21 - Compressor Excessive Starts**
- ALr 22, ALr 23 - TRIAC Overcurrent
- ALr 24 - No High-side Communications
- ALr 25 - High-side update failure
- ALr 27 - Other Sensor Failure**
- ALr 28 - No Downward Tendency Lockout**
- ALr 29 - Excessive Overpressure Trips***
- ALr 30 - Excessive Short Defrosts***
- ALr 38 - Run – Lockout time
- ALr 39 - Grace Time – Lockout time



This fault type is logged and can result in warm or 'out of temperature' product. Some of these faults can be cleared by the storekeeper or site manager while others require servicing by a qualified technician.

Report the alarm early, and with the relevant alarm code, to minimise the asset down time.

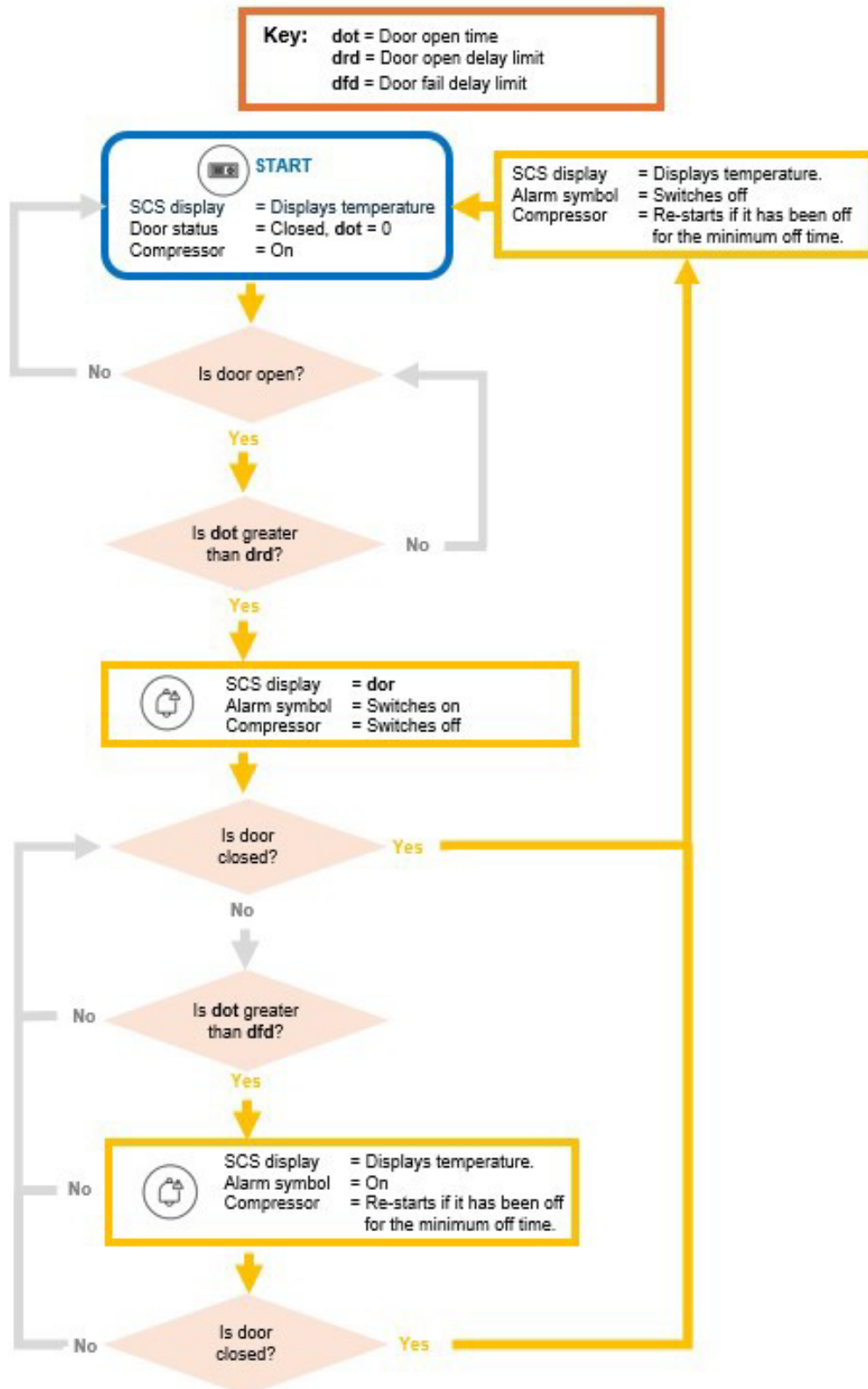
** FW version 1580 onwards

*** FW version 1700 onwards

Door open and door fail

Fault code	Software reference	Possible causes and actions
dor / ALr 1*	Door Open / Door Fail	<p>The door has been left open. The door may not be closed properly due to sagging and may require adjustment.</p> <p>1. Close the door to clear this fault.</p>

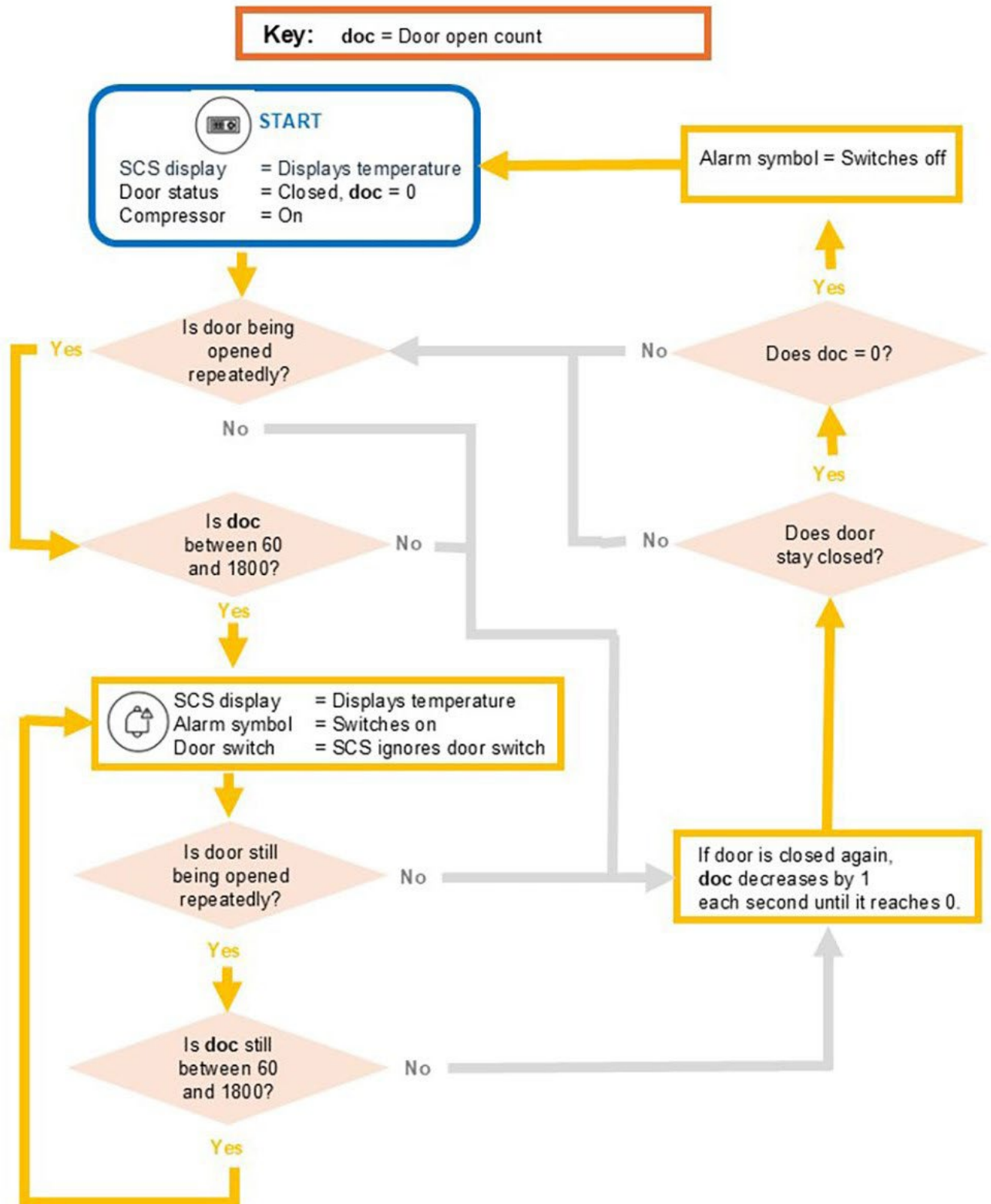
* FW version prior to 1574 used fault code 1



* FW version prior to 1574 used fault code 1

Excessive door openings

Fault code	Software reference	Possible causes and actions
ALr 1*	Excessive Door Open Counts	<p>The door has been left open. The door may not be closed properly due to sagging and may require adjustment.</p> <ol style="list-style-type: none"> 1. Close the door to clear this fault.



* FW version prior to 1574 used fault code 1

Low Product Temperature

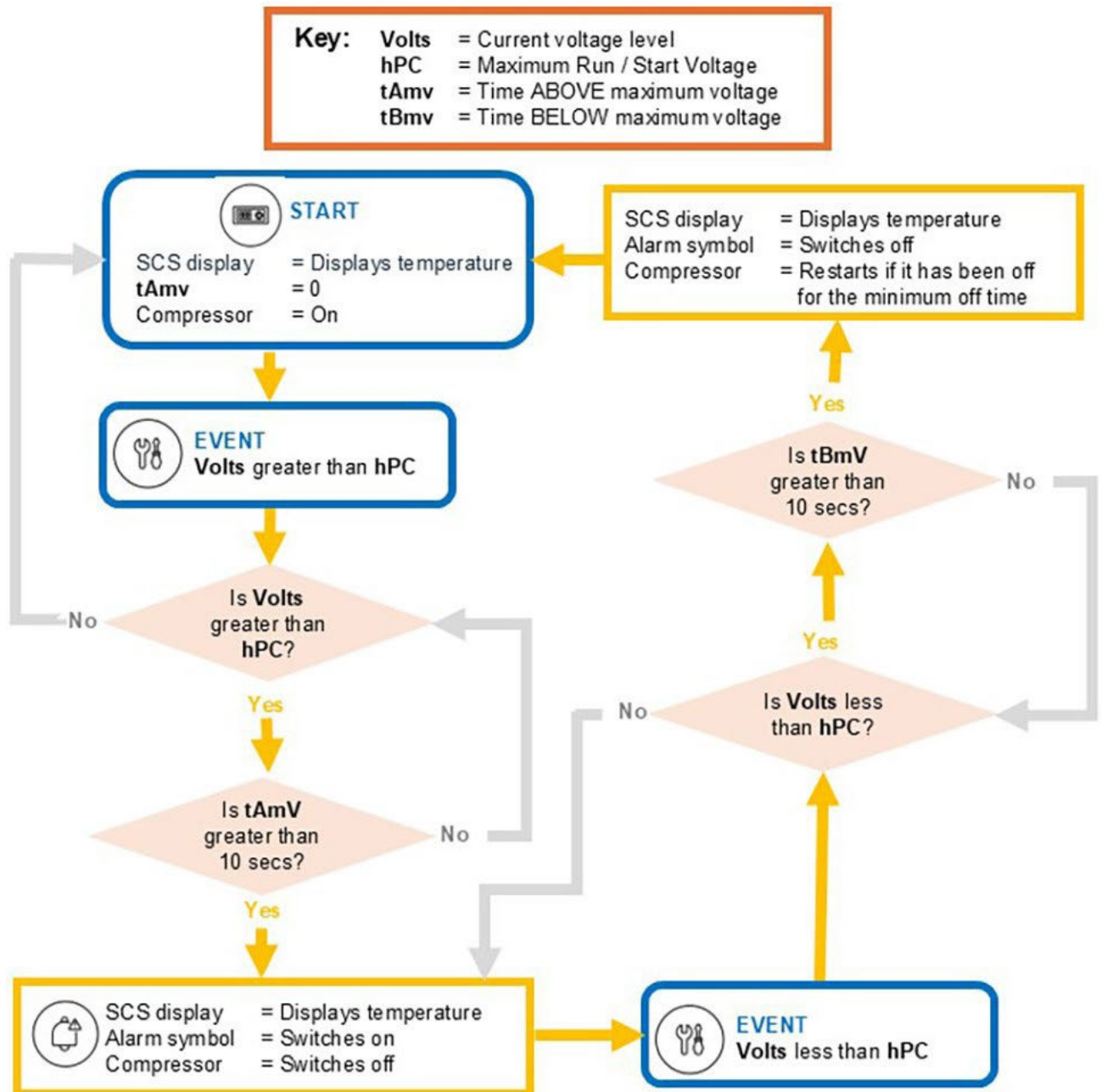
Fault code	Software reference	Possible causes and actions
ALr 8	Low Product Temperature	<p>The return air temperature has fallen below the low temperature threshold for longer than the "Temperature Out-of-spec Alarm Delay" period.</p> <ol style="list-style-type: none"> 1. Validate that the "Low Temperature Alarm Input Value" is set correctly and is at least 1°C below the "Operational Cut-off Temperature Input Value."

High Product Temperature

Fault code	Software reference	Possible causes and actions
ALr 9	High Product Temperature	<p>The return air temperature has risen above the high temperature threshold.</p> <ol style="list-style-type: none"> 1. Validate that the "High Temperature Alarm Input Value" is set correctly and is at least 1°C above the "Operational Cut-off Temperature Input Value." 2. Check that the "Temperature Out-of-spec Alarm Delay" is at least 30 minutes longer than the "Maximum Defrost Cycle Time." 3. Ensure there are no refrigeration issues.

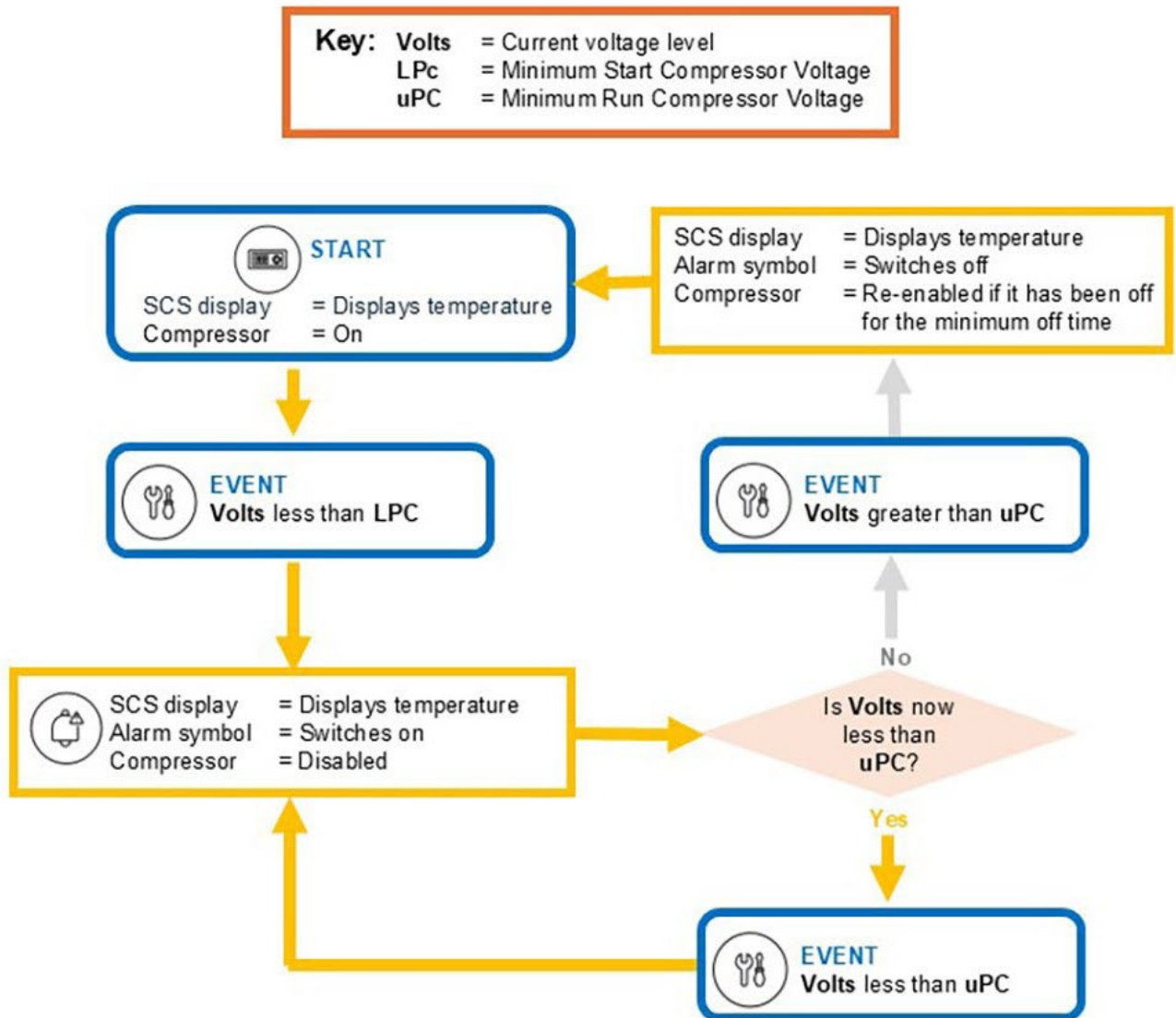
Over Voltage

Fault code	Software reference	Possible causes and actions
-	Over voltage	When the voltage of a cooler is greater than the maximum run, or start voltage, for more than 10 seconds, the SCS Controller can switch off the compressor to protect the asset and trigger an alarm to alert the site manager or staff.



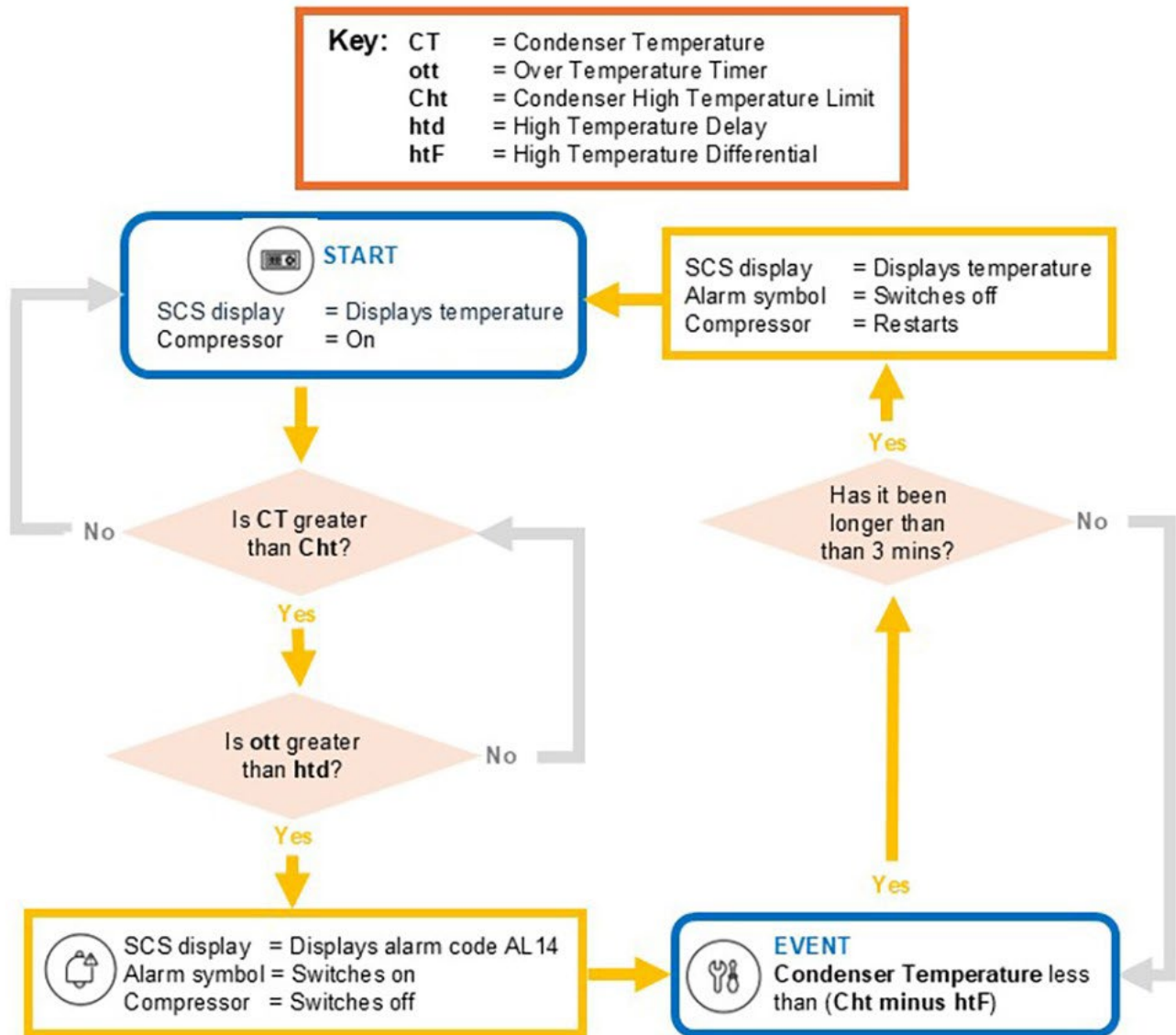
Under Voltage

Fault code	Software reference	Possible causes and actions
-	Under Voltage	When the voltage of a cooler is below the Minimum Start Compressor Voltage, the SCS Controller can switch off the compressor to protect the asset and trigger an alarm to alert the site manager or staff.



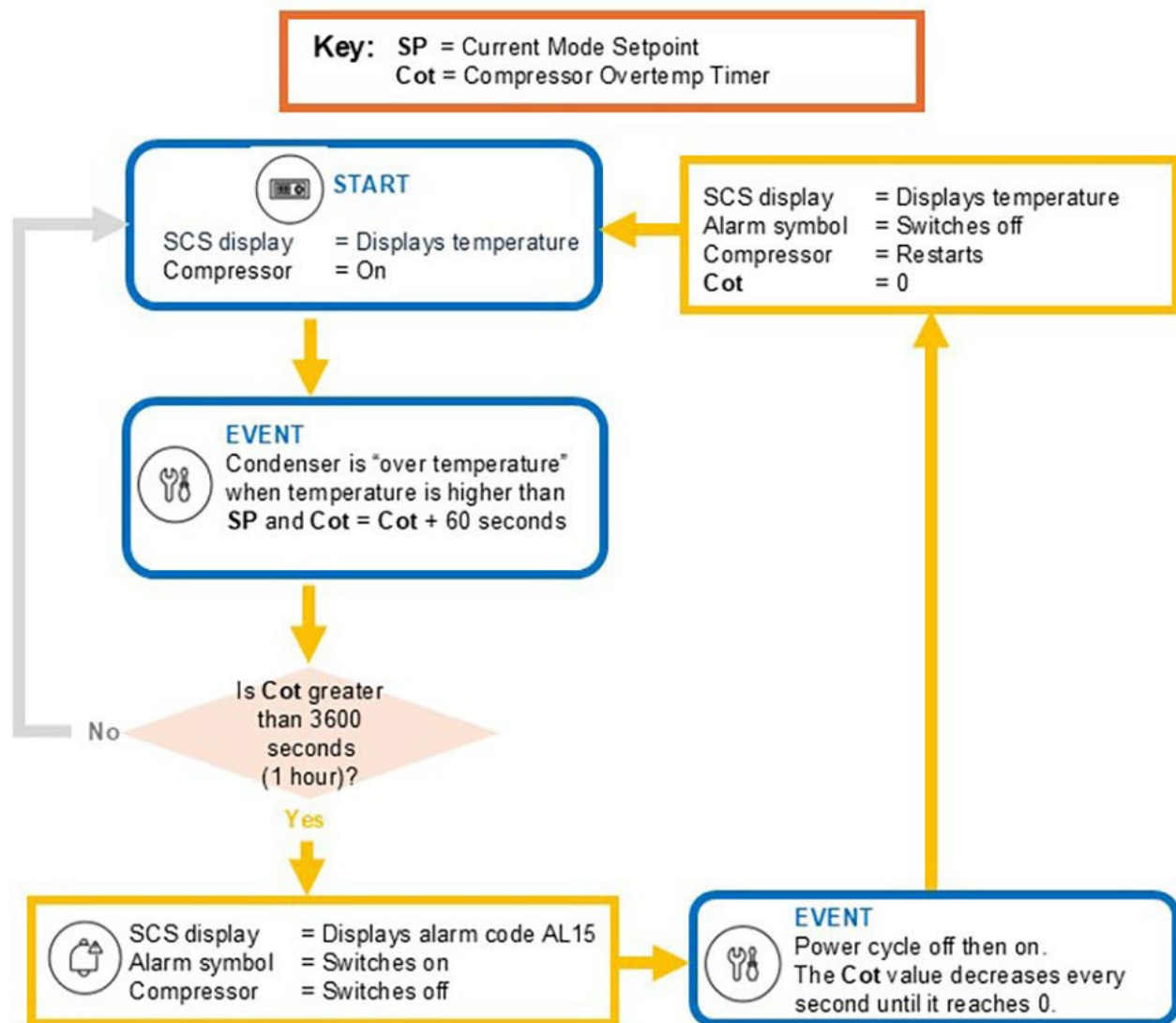
Condenser over temperature

Fault code	Software reference	Possible causes and actions
ALr 14	Condenser Overtemp	<p>The condenser has seen multiple overtemperature conditions in a short space of time.</p> <ol style="list-style-type: none"> 1. Check that nothing is blocking the condenser e.g. boxes 2. Then reset by power cycling. <p>If this fault continues to happen, check that the condenser fan is functioning correctly.</p>



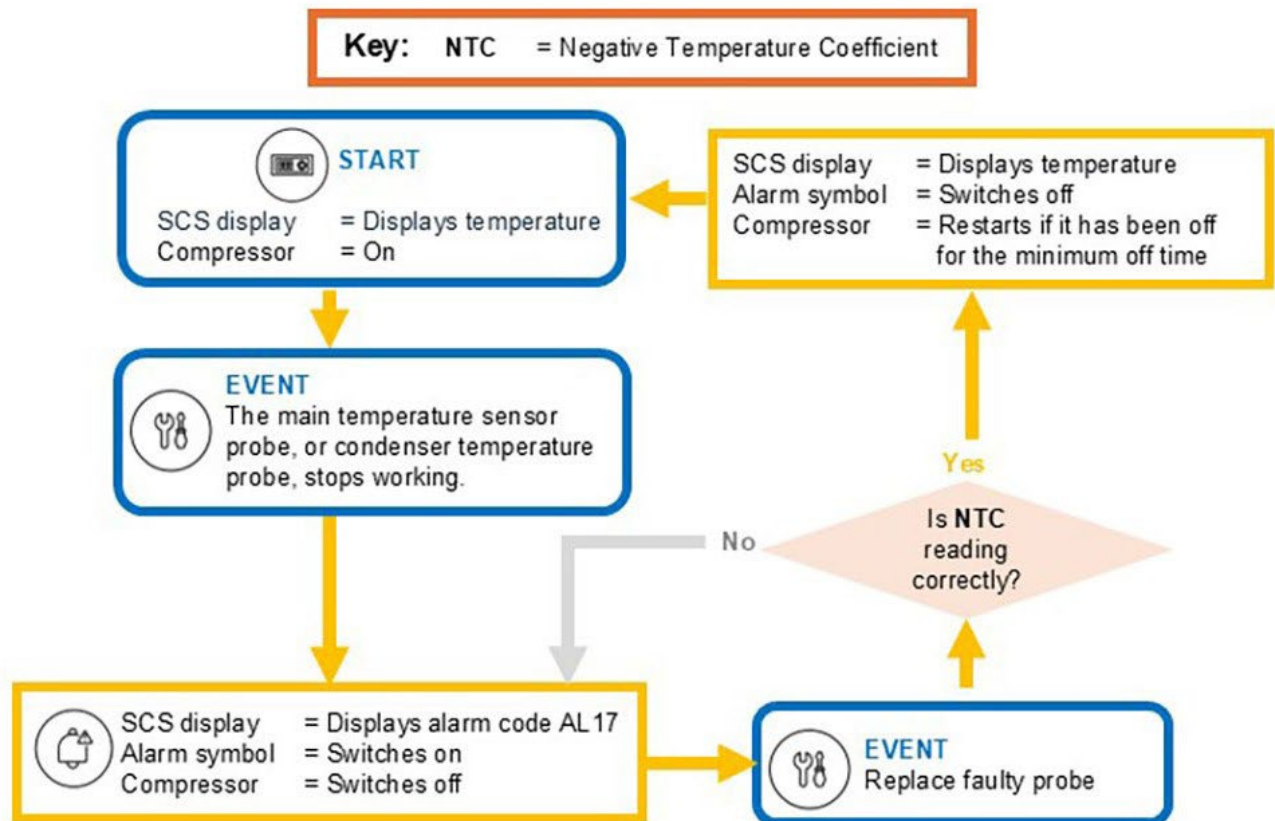
Excessive condenser over temperature

Fault code	Software reference	Possible causes and actions
ALr 15	Excessive Condenser Overtemp	<p>The condenser has seen multiple overtemperature conditions in a short space of time.</p> <ol style="list-style-type: none"> 1. Check that nothing is blocking the condenser e.g. boxes. 2. Then reset by power cycling. <p>If this fault continues to happen, check that the condenser fan is functioning correctly.</p>



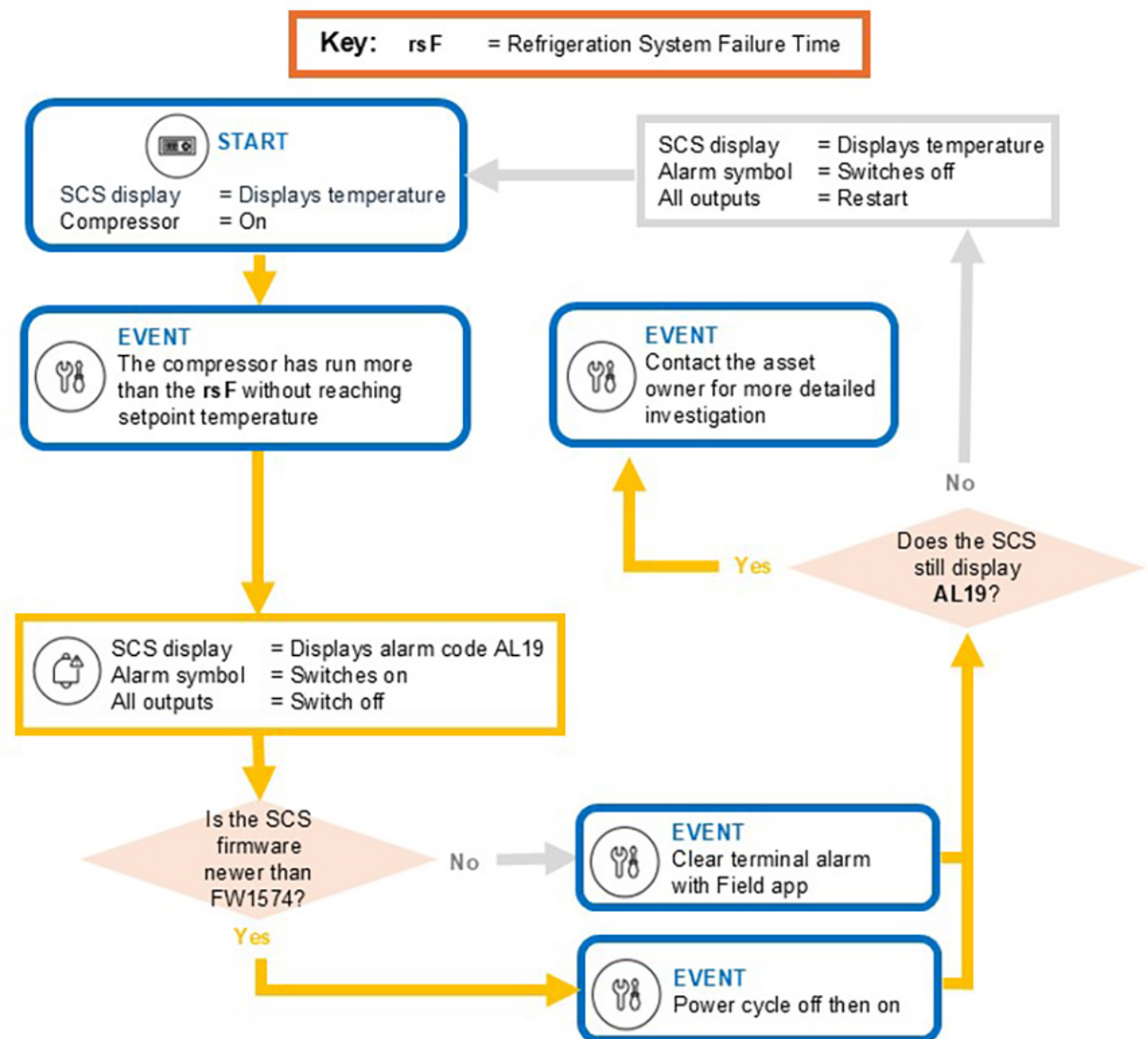
NTC failure

Fault code	Software reference	Possible causes and actions
ALr 17	NTC Failure	<p>Either the main temperature sensor probe or the condenser temperature probe (if fitted) has failed. The temperature probe needs replacing. The system will not run while this fault is present.</p> <ol style="list-style-type: none"> 1. Replace the temperature probe.



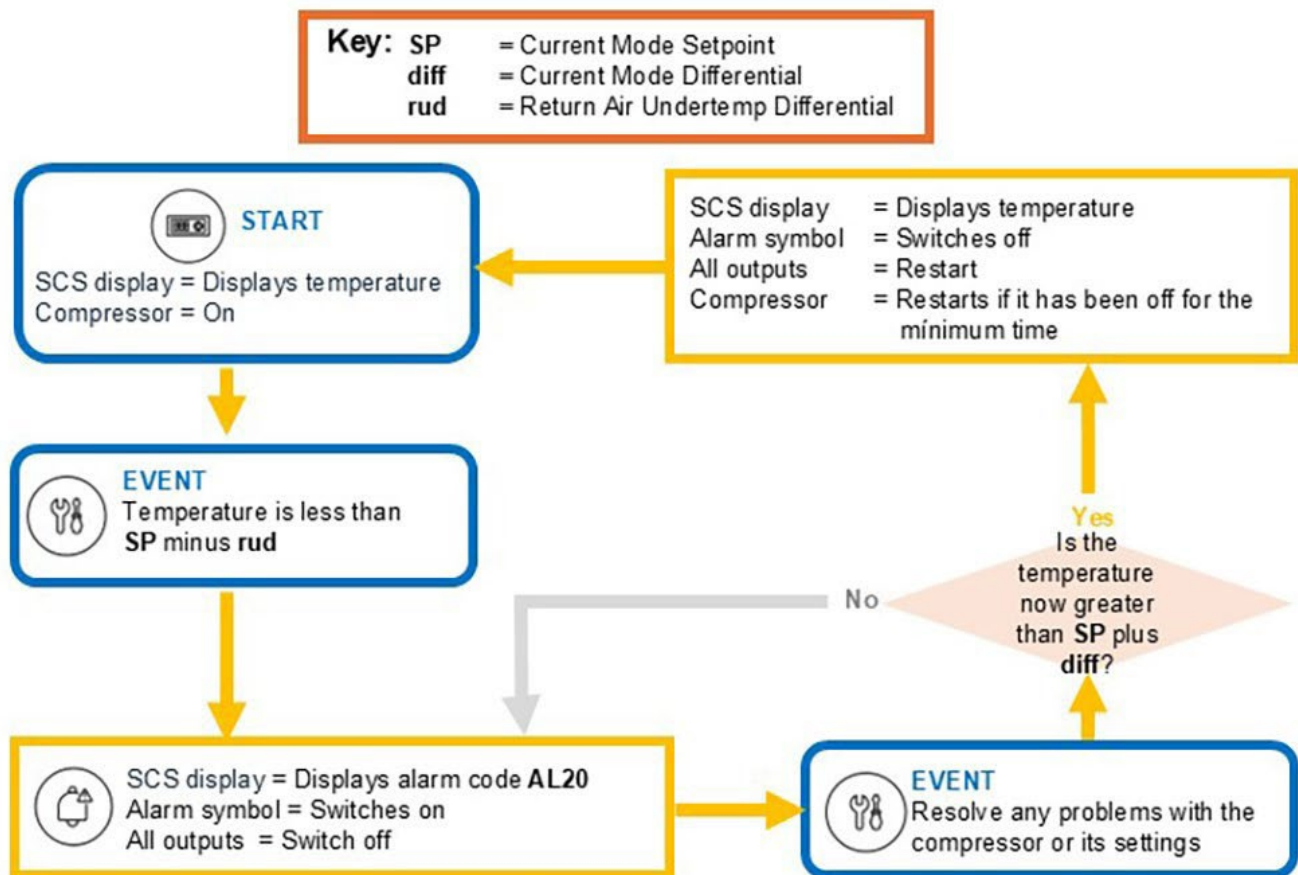
Refrigeration failure

Fault code	Software reference	Possible causes and actions
ALr 19	Refrigeration Failure	<p>The compressor has run continuously for the configured time without reaching the setpoint temperature. There are multiple possibilities preventing the system from achieving temperature.</p> <p>1. There are two actions:</p> <ul style="list-style-type: none"> (For all FW Versions prior to 1574) Write to the “Clear Terminal Alarm” parameter. (In all FW versions from 1574 onwards) Reset the system by power cycling off and on.



Return air under temperature

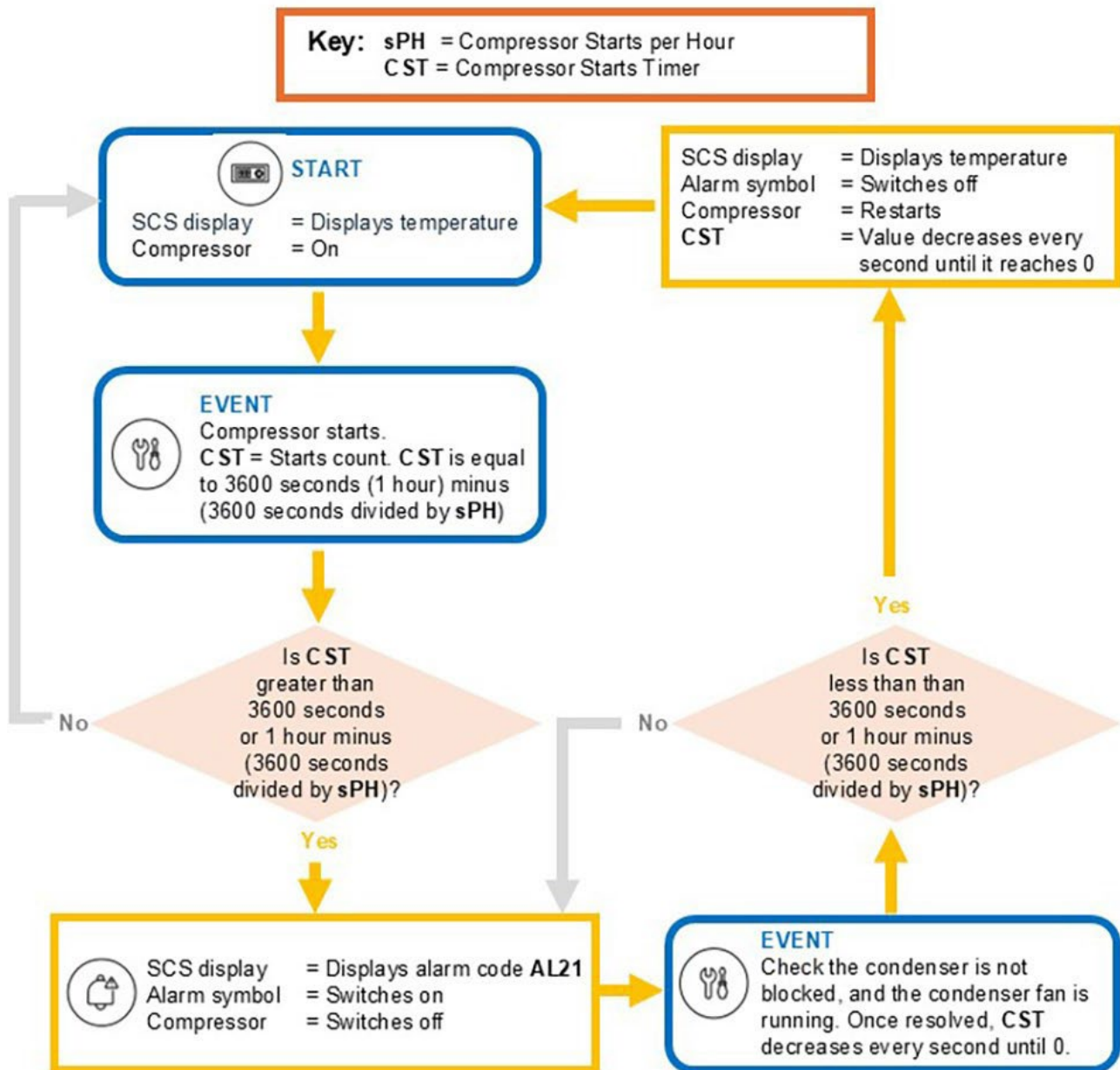
Fault code	Software reference	Possible causes and actions
ALr 20	Return Air Under Temperature	<p>The temperature has dropped below the normal mode setpoint by a specified amount. The product temperature keeps getting colder, even when the compressor is turned off.</p> <ol style="list-style-type: none"> 1. Check the compressor is correctly wired, and that the "Compressor State" parameter is set correctly. <p>If this doesn't resolve the issue it may be due to an external secondary compressor relay failure.</p>



Max compressor starts in 1 hour

Fault code	Software reference	Possible causes and actions
ALr 21	Compressor Excessive Starts **	<p>The compressor has had repeated over temperature trips equaling the high temperature lockout count, within the specified period (This alarm is disabled by default. Parameter access is available upon request). The condenser sensor keeps seeing a high temperature.</p> <ol style="list-style-type: none"> 1. Check the condenser is not blocked, and the condenser fan is running.

** FW version 1580 onwards



TRIAC S1 overcurrent

Fault code	Software reference	Possible causes and actions
ALr 22	TRIAC S1 Overcurrent	<p>The loading on S1 draws too much current. A high current component, such as the compressor, has incorrectly been connected to the S1 output.</p> <ol style="list-style-type: none"> 1. Check the wiring.

TRIAC S2 overcurrent

Fault code	Software reference	Possible causes and actions
ALr 23	TRIAC S2 Overcurrent	<p>The loading on S1 draws too much current. A high current component, such as the compressor, has incorrectly been connected to the S1 output.</p> <ol style="list-style-type: none"> 1. Check the wiring.

Other sensor failure

Fault code	Software reference	Possible causes and actions
ALr 24	No High-side Communications**	<p>There has been no communication from the HS (High-Side) microcontroller.</p> <ol style="list-style-type: none"> 1. Contact AoFrio.

** Dual Firmware only

No Downward Tendency (NDT) lockout

Fault code	Software reference	Possible causes and actions
ALr 25	High-side update failure	<p>The HS microcontroller could not be updated after a firmware update using the DUAL code. Statistics cannot be recorded until the HS is updated.</p> <ol style="list-style-type: none"> 1. Check that the controller has mains power. If so, there is a hardware error, or the HS microcontroller firmware is damaged. 2. Contact AoFrio.

**Dual Firmware only

Other Sensor Failure

Fault code	Software reference	Possible causes and actions
ALr 27	Other Sensor Failure **	<p>A sensor other than the return-air-sensor has failed. The sensor needs replacing. The system, however, will continue to run by ignoring this sensor.</p> <ol style="list-style-type: none"> 1. Replace the sensor.

*** FW version 1700 onwards

No Downward Tendency Lockout

Fault code	Software reference	Possible causes and actions
ALr 28	No Downward Tendency lockout **	<p>The NDT defrost has been blocked the maximum number of times. There could be multiple possibilities that are preventing the system from reaching its desired temperature. The most likely causes are frozen evaporator coils, low refrigerant charge or slow fan speed.</p> <ol style="list-style-type: none"> 1. Check the evaporator coils, refrigerant and fan speed.

** FW version 1700 onwards

Excessive Overpressure Trips

Fault code	Software reference	Possible causes and actions
ALr 29	Excessive Overpressure Trips ***	<p>The compressor has had repeated over pressure trips equalling the Over pressure lockout count within the specified period. (This alarm is disabled by default. Parameter access is available upon request). The compressor is faulty or requires servicing. The condenser coil may be blocked and may require cleaning.</p> <ol style="list-style-type: none"> 1. Check the compressor and condenser coil.

*** FW version 1700 onwards

Excessive short defrosts

Fault code	Software reference	Possible causes and actions
ALr 30	Excessive Short Defrosts	<p>The defrost initiation probe has repeatedly triggered defrosts within the min allowable time between defrosts, equalling the Excessive Defrosts Lockout Count. (This alarm is disabled by default. Parameter access is available upon request). The defrost initiation probe is reading a low value within a short time of the compressor turning on.</p> <ol style="list-style-type: none"> 1. Check that the probe is not touching the evaporator coils, and that the evaporator fan is running.

Run – Lockout Time

Fault code	Software reference	Possible causes and actions
ALr 38	Run – Lockout Time	<p>The controller has not been connected by an application during the "Lockout Time." Therefore, the controller has turned off all outputs.</p> <ol style="list-style-type: none"> 1. Connect to the controller with any SCS application to reset the timer and restart operation. 2. Restart the controller for a "grace" period by entering a PIN code via the keypad.

Grace Time – Lockout Time

Fault code	Software reference	Possible causes and actions
ALr 39	Grace Time – Lockout Time	<p>The controller was not connected by an application during the "Run – Lockout Time." Then, the controller was reactivated via a keypad password (additional grace time) but has not been connected by an application during the "grace time – lockout time." Therefore, the controller has turned off all outputs.</p> <ol style="list-style-type: none"> 1. Connect to the controller with any SCS application to reset the timer and restart operation.

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