



USER MANUAL

SCS Controller – Faults and Alarms

Document # AO197_i1 Issue date: February 2025



Copyright © 2024 – AoFrio Ltd. All rights reserved

AoFrio Ltd.

P:+64 9 477 4500 **E:**sales@aofrio.com

www.aofrio.com



Contents

Fault type	Alarm code	Page
Overview	-	3
Door open and door fail	dor / AL1	4
Excessive door openings	dor / AL1	5
Over voltage	-	6
Under voltage	-	7
Condenser over temperature	-	8
Excessive condenser over temperature	AL15	10
NTC failure	AL17	11
Refrigeration failure	AL19	12
Return air under temperature	AL20	13
Max compressor starts in 1 hour	AL21	9
TRIAC S1 overcurrent	AL22	14
TRIAC S2 overcurrent	AL23	14
Other sensor failure	AL27	14
No Downward Tendency (NDT) lockout	AL28	14
Excessive overpressure trips	AL29	15
Excessive short defrosts	AL30	15

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
- Condenser Overtemp



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 - Door Left Open Alarm
- AL15 - Excessive Condenser Overtemp**
- AL17 - NTC Failure
- AL19 - Refrigeration Fail
- AL20 - Return Air Under Temp
- AL21 – Compressor Excessive Starts**
- AL22, AL23 - TRIAC Overcurrent
- AL27 - Other Sensor Failure**
- AL28 - No Downward Tendency Lockout**
- AL29 - Excessive Overpressure Trips***
- AL30 - Excessive Short Defrosts***



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.

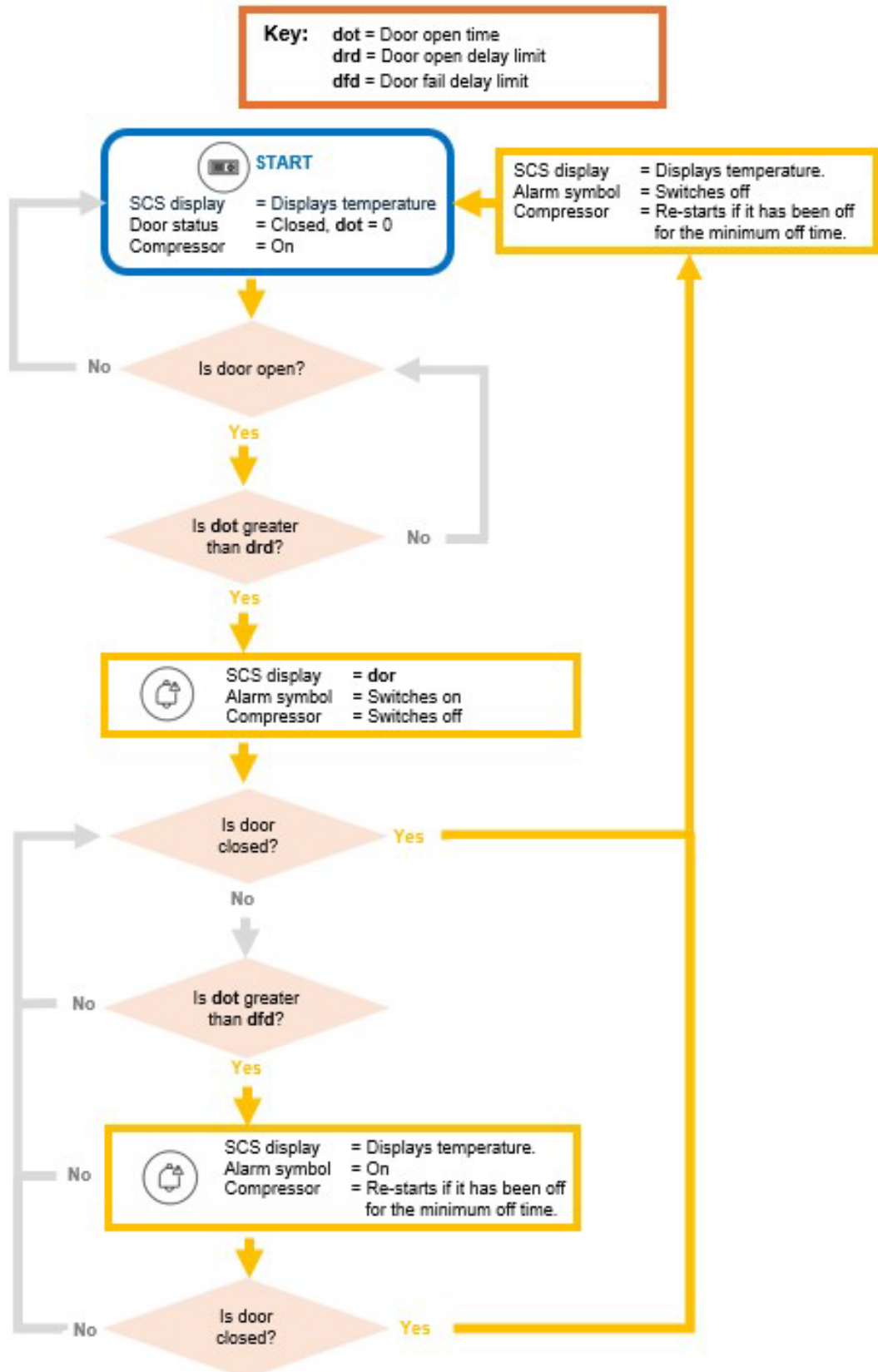
Report the alarm early, and with the relevant alarm code, to minimise the asset down time.

** FW version 1580 onwards

*** FW version 1700 onwards

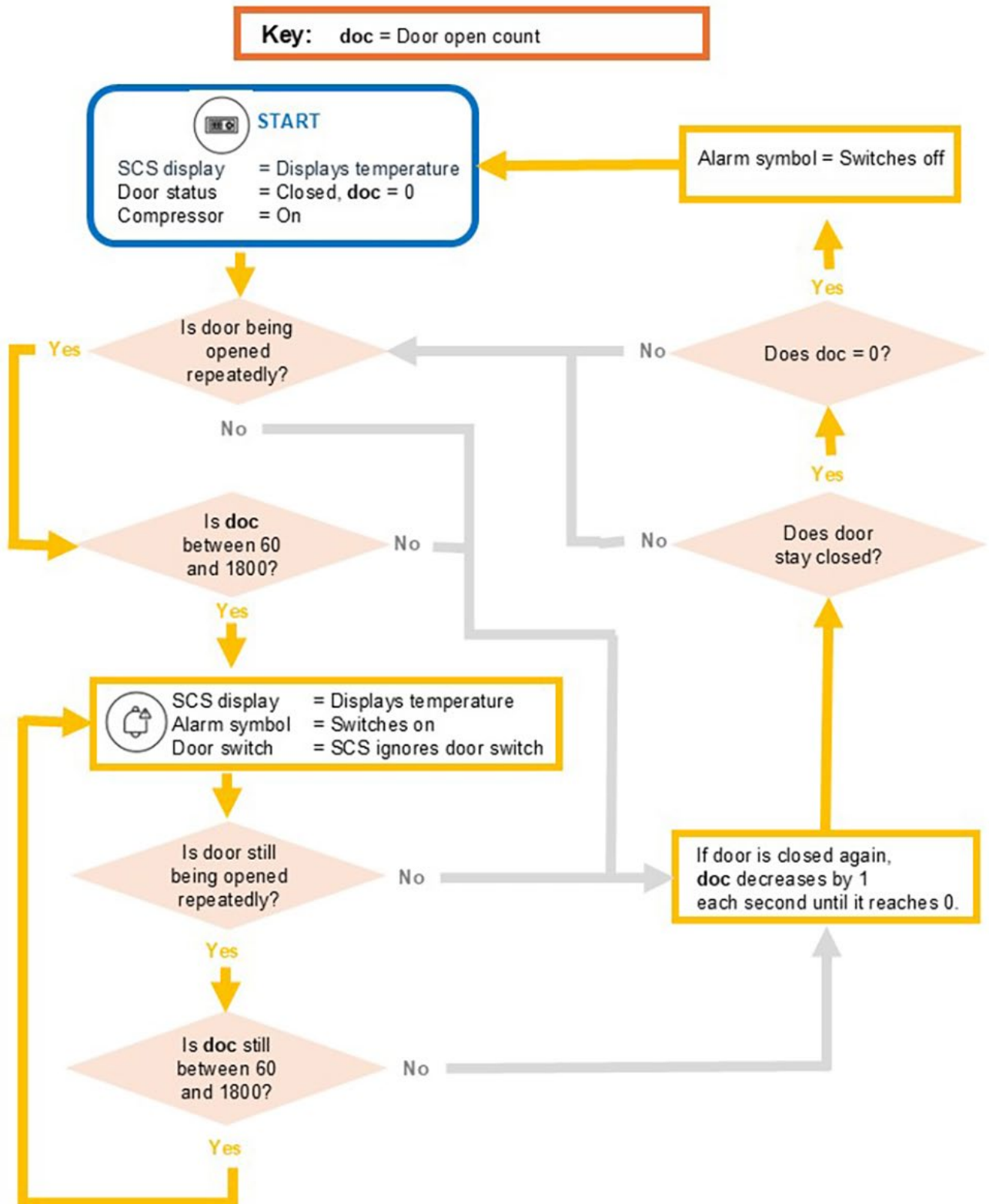
Door open and door fail

Fault code	Software reference	Possible causes and actions
dor / AL1*	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>



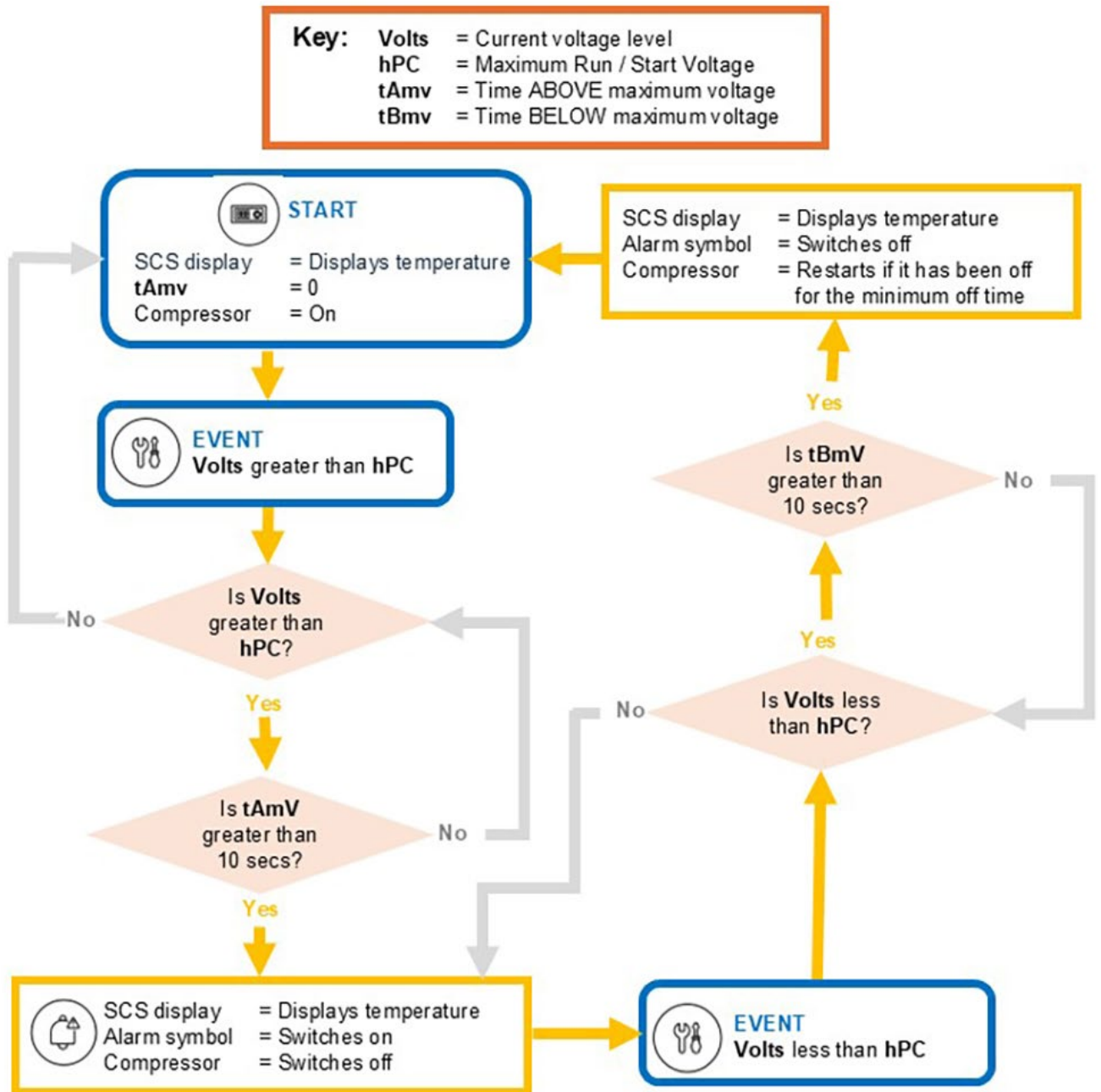
Excessive door openings

Fault code	Software reference	Possible causes and actions
dor / AL1*	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.



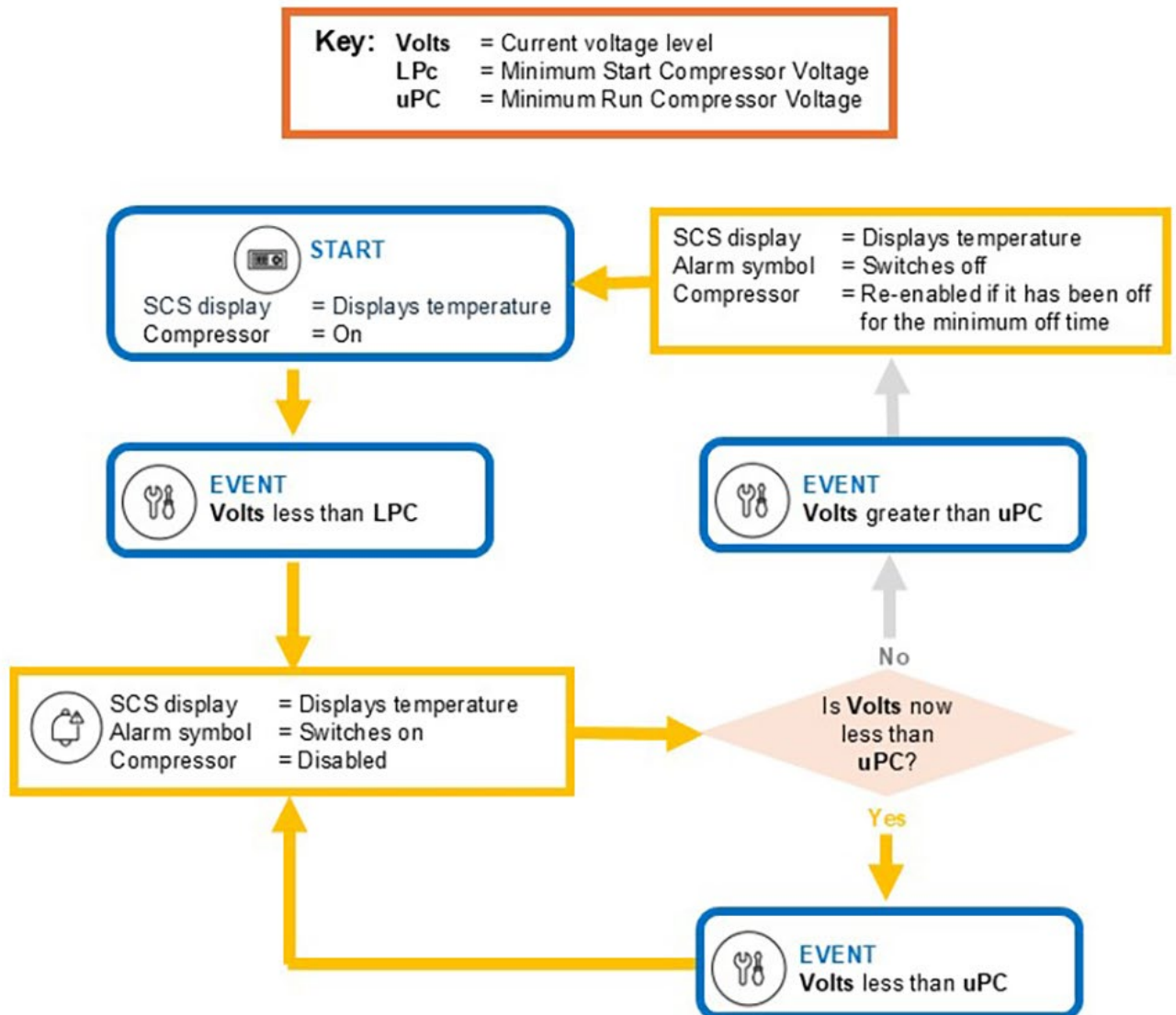
Over voltage

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.



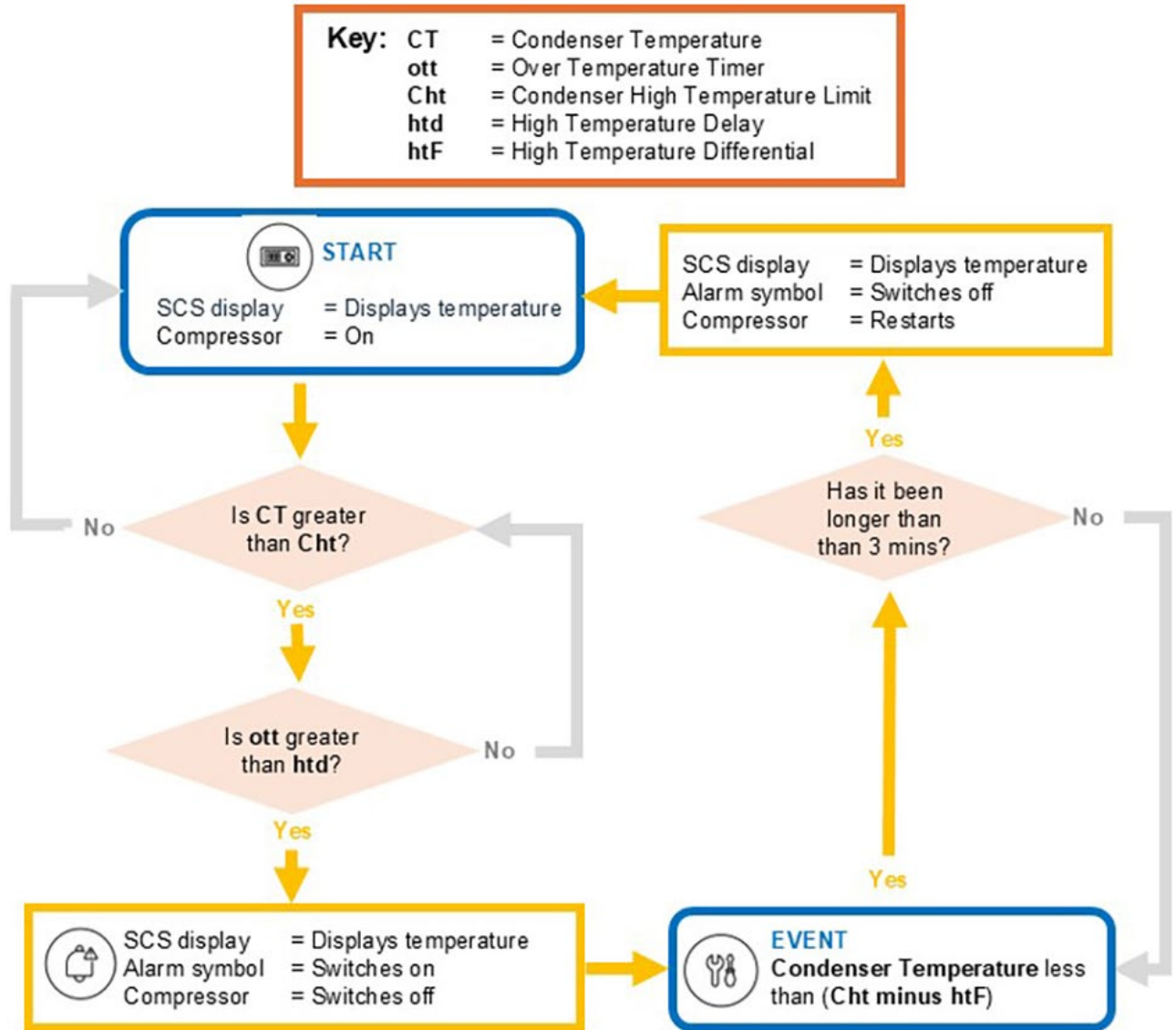
Under voltage

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.



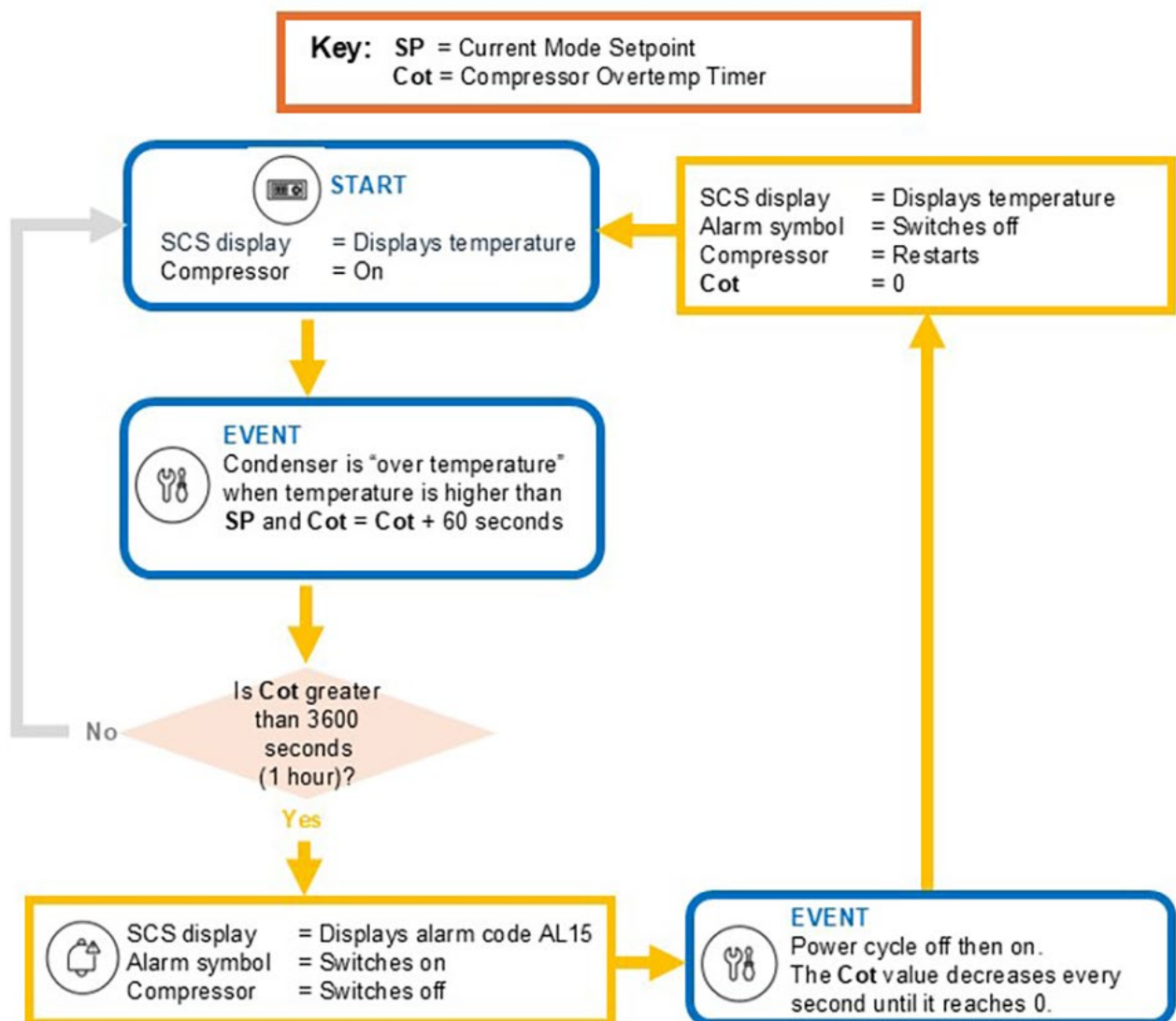
Condenser over temperature

Fault code	Software reference	Possible causes and actions
-	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>



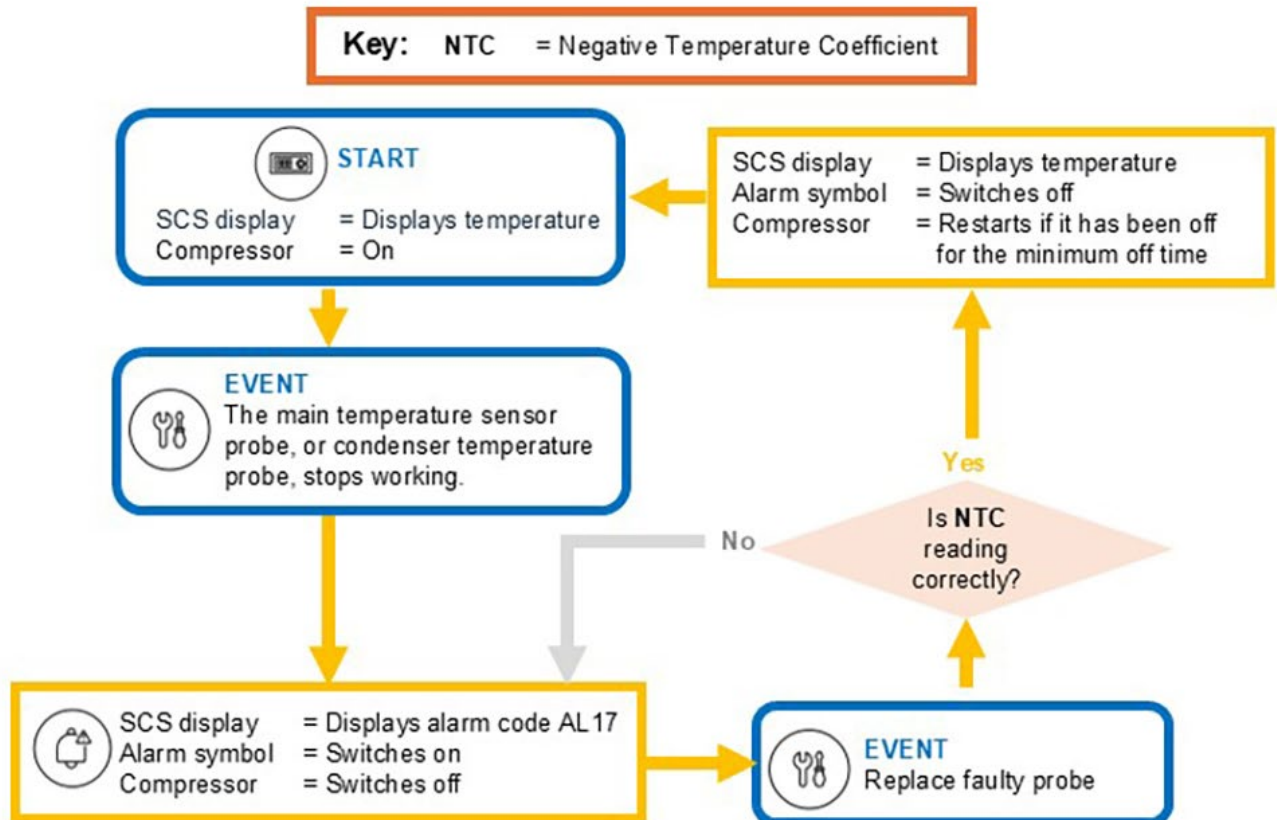
Excessive condenser over temperature

Fault code	Software reference	Possible causes and actions
AL15	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>



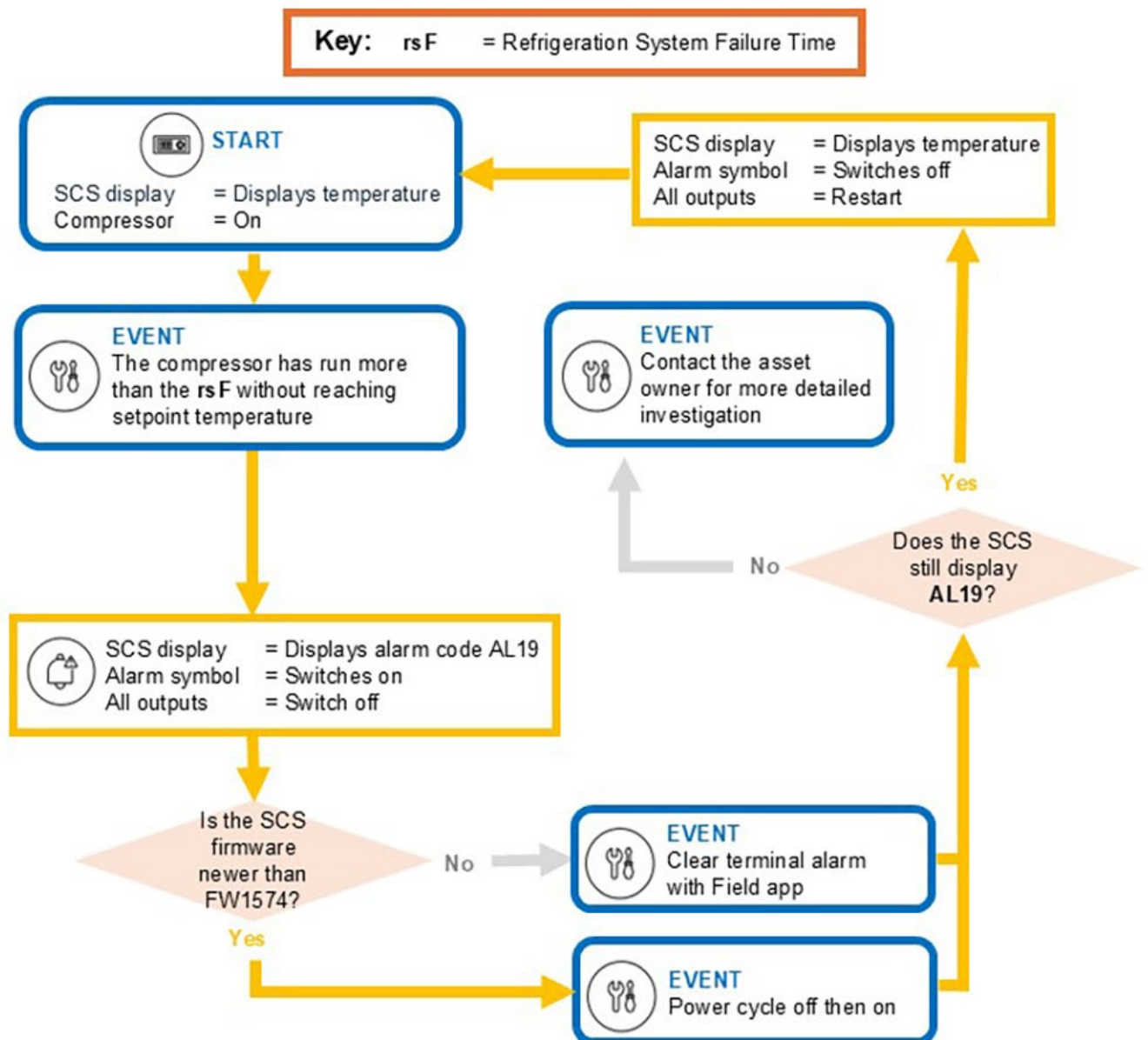
NTC failure

Fault code	Software reference	Possible causes and actions
AL17	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> <p>1. Replace the temperature probe.</p>



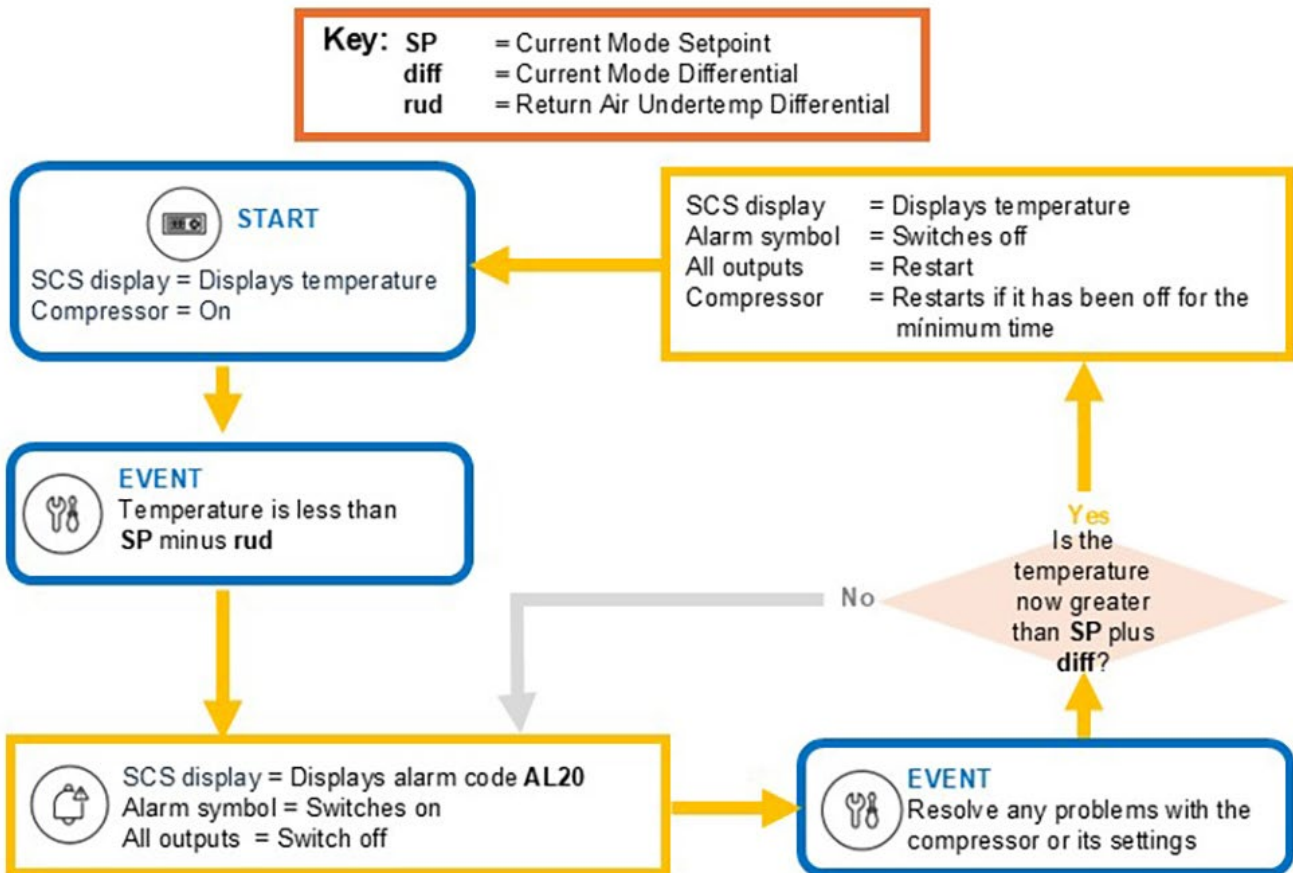
Refrigeration failure

Fault code	Software reference	Possible causes and actions
AL19	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

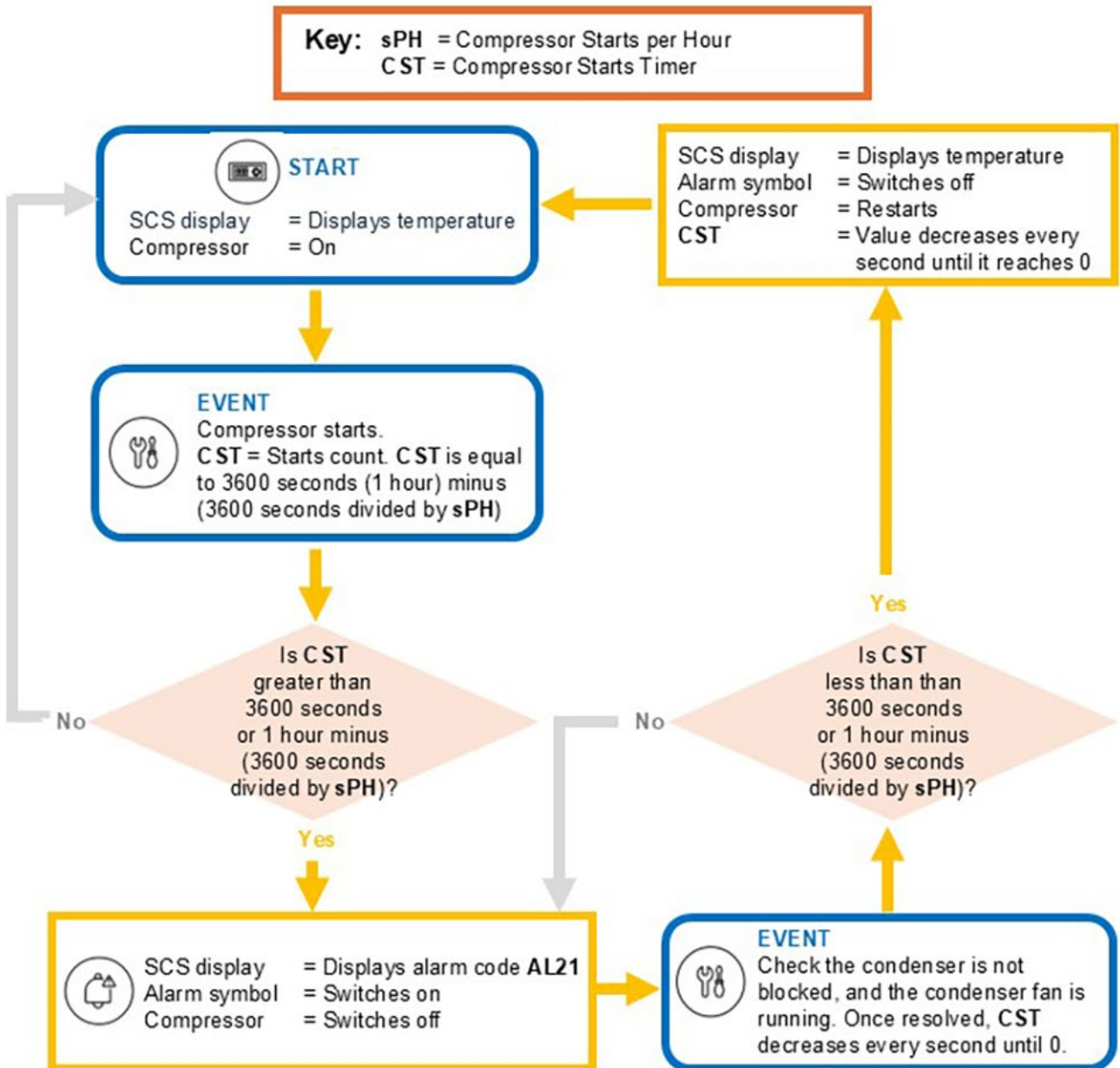
Fault code	Software reference	Possible causes and actions
AL20	Return Air Under Temperature	<p>The temperature has dropped below the normal mode setpoint by a specified amount. The product temperature keeps getting colder, even when the compressor is turned off.</p> <ol style="list-style-type: none"> 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
AL21	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
AL22	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
AL23	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
AL27	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 1580 onwards

No Downward Tendency (NDT) lockout

Fault code	Software reference	Possible causes and actions
AL28	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 to reach 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 1580 onwards

Excessive overpressure trips

Fault code	Software reference	Possible causes and actions
AL29	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
AL30	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.

*** FW version 1700 onwards

SCS Controller user manual

Faults and Alarms

AO197_i1 Issue date: February 2025

P:+64 9 477 4500 **E:** sales@aofrio.com

www.aofrio.com

