

Introduction

The objective of this Installation and Operational Qualification (IQ/OQ) document is to qualify the installation and operation of Arctiko appliances.

The Installation and Operational Qualification document defines the minimum test procedures and acceptance criteria to be used to establish that the Arctiko appliance is installed and operated according to our specifications.

The Installation Qualification is intended to verify that the appliance is delivered in correspondence with the ordered appliance and is installed in a correct environment.

The Operational Qualification is intended to verify the function of the appliance and its readiness for operation.

Please be aware that local IQ/OQ procedures can require additional control and verification during the validation.

If any documentation, which were not supplied with the appliance, should be needed for the present qualification, such can be downloaded from the service website of Arctiko. Please contact the distributor of the Arctiko appliance to obtain the documentation in question.

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1 Basic information

Model: _____

Serial number: _____

Date of qualification (DD/MM/YYYY): _____

Qualification carried out by (name): _____

Customer: _____

Location of the appliance: _____

COMMENTS

1.1 Signature and device list

Each person, who participates in the present IQ/OQ qualification, shall fill out the signature list below in order to establish traceability to the test signatures.

All devices used for the execution of the current IQ/OQ shall be noted in below device list.

SIGNATURE LIST

NAME (CAPITAL LETTERS)	JOB TITLE	DATE AND SIGNATURE

DEVICE LIST

DESCRIPTION	BRAND	MODEL	DATE OF CALIBRATION

2 Installation Qualification

The Installation Qualification is intended to verify that the appliance is delivered in correspondence with the ordered appliance and is installed in a correct environment.

The IQ is concluded if all acceptance criteria are fulfilled. If any deviations are found during the qualification, such must be corrected and thereafter approved.

2.1 Documentation verification

Check and verify the following points:

DOCUMENTATION	CHECK (v)	COMMENTS
Ensure operating instruction manual has been supplied with the appliance		
Ensure operating instruction manual has been read and understood by the user(s)		

2.2 Appliance check points

Check and verify the following points:

SCOPE OF SUPPLY		CHECK (v)	COMMENTS
Delivery	Ensure that the appliance complies with the ordered appliance as well as containing optional accessories (if any) as stated in the purchase order of the customer		
Power supply	Ensure the power supply of the appliance complies with the purchase order of the customer (check the rating plate of the appliance)		

APPLIANCE CHECK POINTS		CHECK (✓)	COMMENTS
Packaging & protection material	Ensure all packing material has been removed		
	Ensure all protection foil has been removed from the cabinet and display		
Cabinet	Ensure no scratches on exterior cabinet		
	Ensure no scratches on interior cabinet		
	Ensure no cracks on plastic frames		
Door	Ensure the door can open and close		
	Ensure the door can be locked using the key		
	Ensure no gap between gasket and frame		
	Ensure no scratches		
Castors	Ensure that the castors are locked (if equipped with castors)		
Feet	Ensure that the feet are levelled (if equipped with levelling feet)		
Controller	Ensure no scratches on the display		
	Ensure that all cables are mounted according to safety requirements		
Temperature sensor	Ensure that the temperature sensor is correctly mounted		
Remote alarm connection	Ensure that the remote alarm contact is correctly connected to an external system (utilization of the remote alarm contact is optional)		
Compressor	Ensure no unusual noise		
Fan	Ensure no unusual noise		
Electrical connection	Ensure that the power cord is correctly mounted on the appliance		
	Ensure that the electrical connection is performed in accordance with: a) power supply noted on the rating plate of the appliance b) power supply of the power socket c) operating instruction manual d) local regulations	a) b) c) d)	
	Ensure that the power supply fuse of the switchboard is 10A		
Cleaning	Ensure that the appliance has been cleaned		

2.3 Environmental verification

Check and verify the following points:

ENVIRONMENT		CHECK (✓)	COMMENTS
Ambient conditions	Ensure by using a thermometer a maximum ambient temperature of: +32°C (freezer models) +32°C (refrigerator models)		
	Ensure no direct sunlight on the appliance		
	Ensure that the appliance is not located near heat sources		
	Ensure that the room is well ventilated		
Surface	Ensure installation on a solid and flat surface to avoid vibrations and unintentional noise		
Air circulation	Ensure free space around the appliance to ensure the required air circulation according to the operating instructions manual		

CHECKED/TESTED BY	DATE	SIGNATURE

VERIFIED BY	DATE	SIGNATURE

3 Operational Qualification

The Operational Qualification is intended to verify the function of the appliance and its readiness for operation.

The OQ is concluded if all acceptance criteria are fulfilled. If any deviations are found during the qualification, such must be corrected and thereafter approved.

Check and verify the following parameters and fill out the below table. We recommend that the parameters are checked app. once a year.

3.1 Parameter verification and adjustment

DESCRIPTION	DEFAULT SETTINGS	DEFAULT SETTINGS	CHECK/ADJUST THE SET VALUE AND NOTE THE VALUE	COMMENTS
	LRE 120 / 440 PRE 120 / 440	LFE 110		
Set point (St)	+5	-20		
Password (PS)	22	22		
Control delta / hysteresis (rd)	2	2		
Interval between defrost (dl)	5	0		
High temperature alarm bypass time after defrost and door open (d8)	1	1		
Alarm bypass after door open (d8d)	1	1		
Low temp. alarm (AL)*	1	-28		
High temp. alarm (AH)*	8	-12		
Low and high alarm delay (Ad)	5 min.	5 min.		

3.2 Placement of test probes

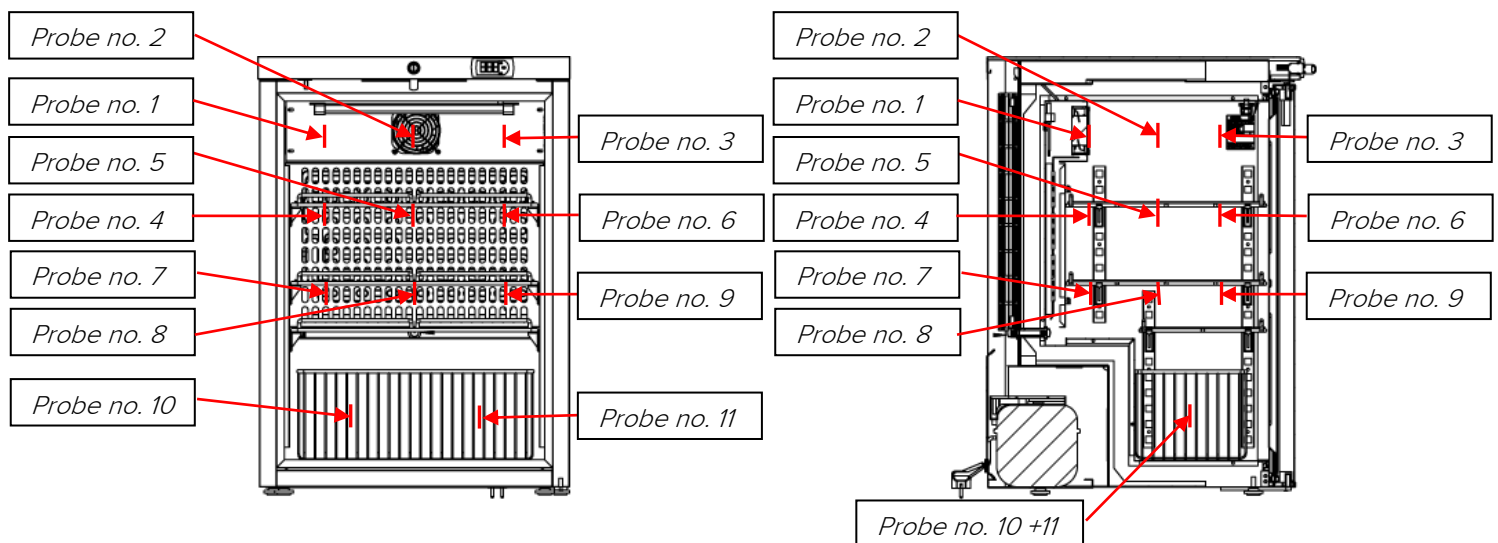
Prepare the appliance for the Operational Qualification by mounting test probes. Place the test probes inside the appliance as described in below table and as shown in below illustration (see the red arrows).

Each test probe must be loaded with a 25 gr. brass block (or equivalent) to ensure precise temperature measurement.



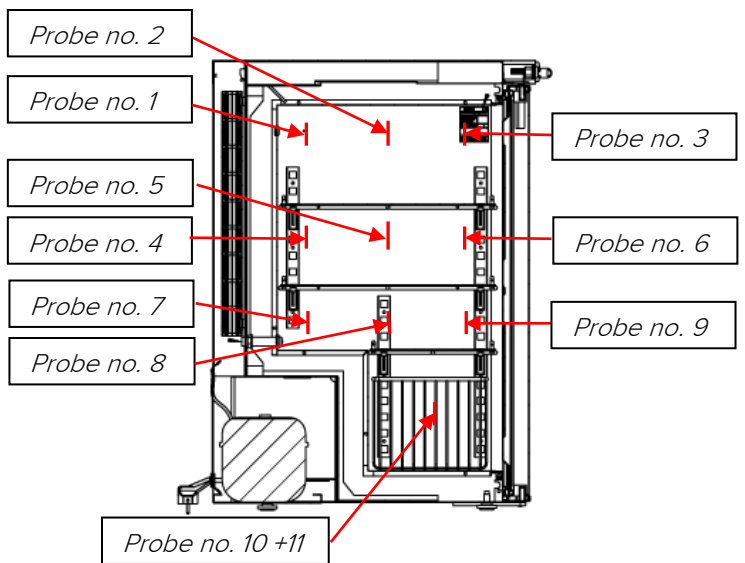
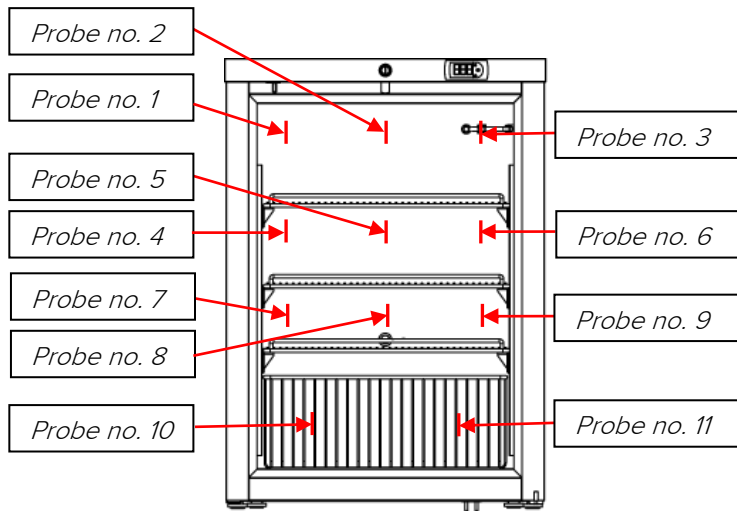
LRE/PRE 120

PROBE	LOCATION
Probe no. 1	Left back 10 cm distance from the left, back and top of the interior cabinet
Probe no. 2	Center of the chamber 10cm from the top
Probe no. 3	Right front 10 cm distance from the left, back and top of the interior cabinet
Probe no. 4	Left front 10 cm distance from the left, front and ??cm from top of the interior cabinet
Probe no. 5	Center of the chamber ??cm from the top
Probe no. 6	Right back 10 cm distance from the left, front and ??cm from top of the interior cabinet
Probe no. 7	Left back 10 cm distance from the left, back and ??cm from top of the interior cabinet
Probe no. 8	Center of the chamber ??cm from the top
Probe no. 9	Right front 10 cm distance from the left, front and ??cm from top of the interior cabinet
Probe no. 10	Left middle, 10cm from bottom
Probe no. 11	Right middle, 10cm from bottom



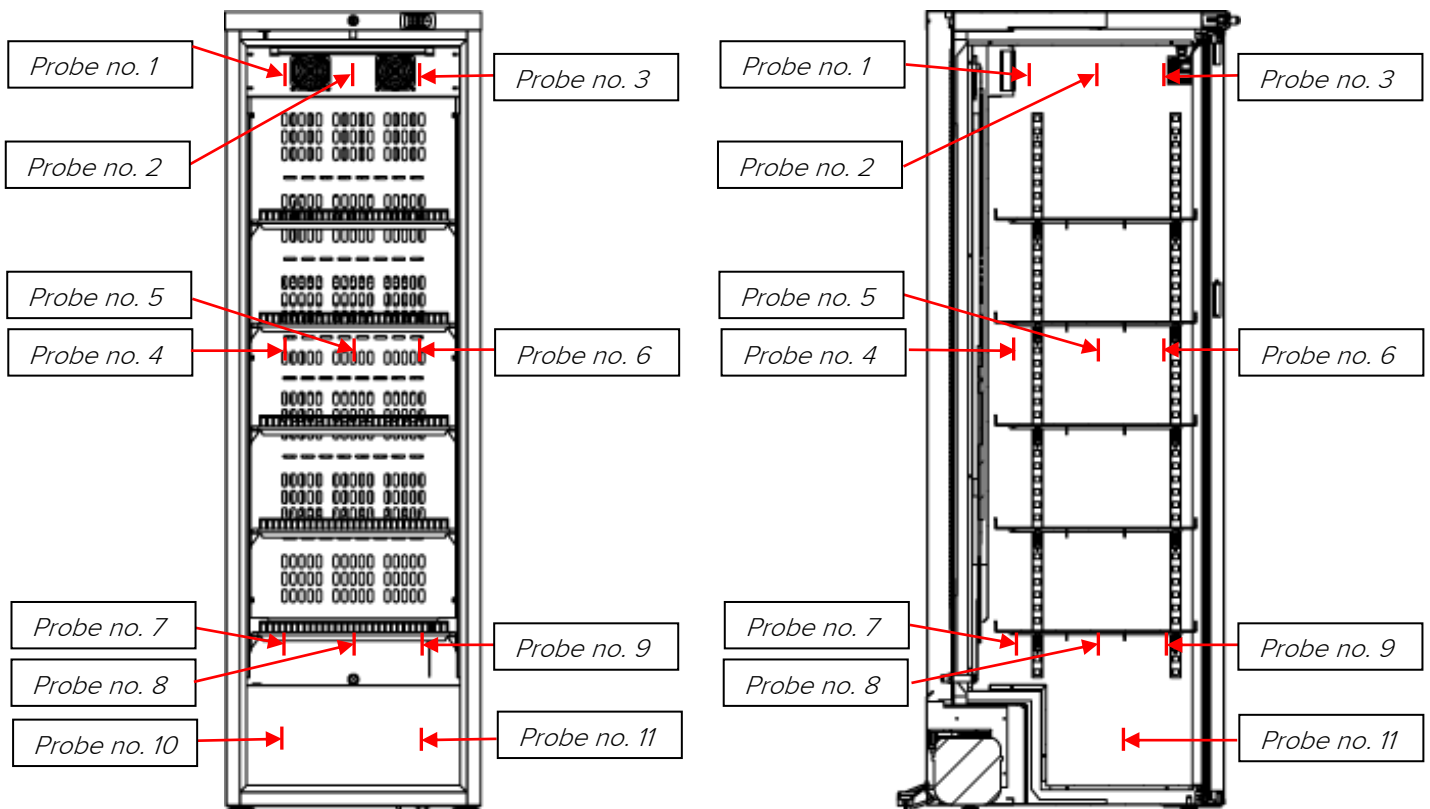
LFE 110

PROBE	LOCATION
Probe no. 1	Left back 10 cm distance from the left, back and top of the interior cabinet
Probe no. 2	Center of the chamber 10cm from the top
Probe no. 3	Right front 10 cm distance from the left, back and top of the interior cabinet
Probe no. 4	Left front 10 cm distance from the left, front and ??cm from top of the interior cabinet
Probe no. 5	Center of the chamber ??cm from the top
Probe no. 6	Right back 10 cm distance from the left, front and ??cm from top of the interior cabinet
Probe no. 7	Left back 10 cm distance from the left, back and ??cm from top of the interior cabinet
Probe no. 8	Center of the chamber ??cm from the top
Probe no. 9	Right front 10 cm distance from the left, front and ??cm from top of the interior cabinet
Probe no. 10	Left middle, 10cm from bottom
Probe no. 11	Right middle, 10cm from bottom
Probe no. 12	Middle of the basket in the interior cabinet



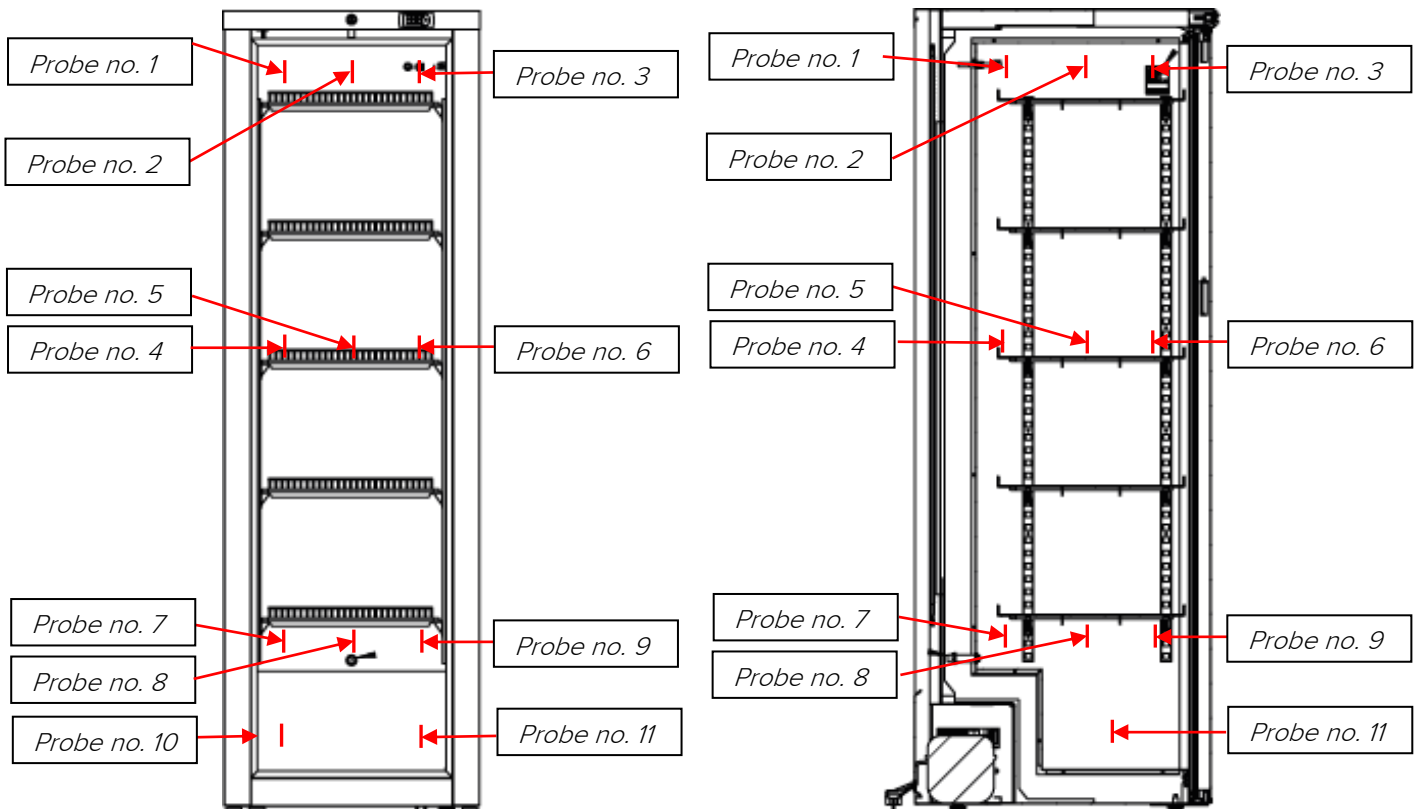
LRE/PRE 440

PROBE	LOCATION
Probe no. 1	Left back 10 cm distance from the left, back and top of the interior cabinet
Probe no. 2	Center of the chamber 10cm from the top
Probe no. 3	Right front 10 cm distance from the left, back and top of the interior cabinet
Probe no. 4	Left front 10 cm distance from the left, front and ??cm from top of the interior cabinet
Probe no. 5	Center of the chamber ??cm from the top
Probe no. 6	Right back 10 cm distance from the left, front and ??cm from top of the interior cabinet
Probe no. 7	Left back 10 cm distance from the left, back and ??cm from top of the interior cabinet
Probe no. 8	Center of the chamber ??cm from the top
Probe no. 9	Right front 10 cm distance from the left, front and ??cm from top of the interior cabinet
Probe no. 10	Left middle, 10cm from bottom
Probe no. 11	Right middle, 10cm from bottom
Probe no. 12	Middle of the basket in the interior cabinet



LFE 360

PROBE	LOCATION
Probe no. 1	Left back 10 cm distance from the left, back and top of the interior cabinet
Probe no. 2	Center of the chamber 10cm from the top
Probe no. 3	Right front 10 cm distance from the left, back and top of the interior cabinet
Probe no. 4	Left front 10 cm distance from the left, front and ??cm from top of the interior cabinet
Probe no. 5	Center of the chamber ??cm from the top
Probe no. 6	Right back 10 cm distance from the left, front and ??cm from top of the interior cabinet
Probe no. 7	Left back 10 cm distance from the left, back and ??cm from top of the interior cabinet
Probe no. 8	Center of the chamber ??cm from the top
Probe no. 9	Right front 10 cm distance from the left, front and ??cm from top of the interior cabinet
Probe no. 10 Probe	Left middle, 10cm from bottom
Probe no. 11	Right middle, 10cm from bottom
no. 12	Middle of the basket in the interior cabinet

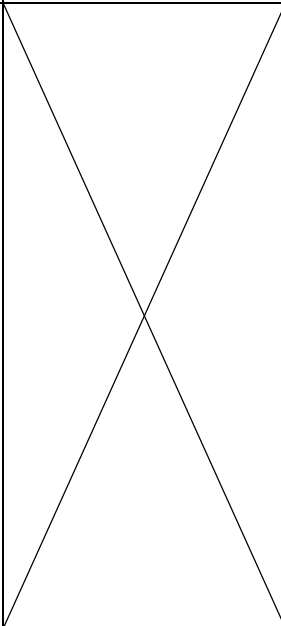


3.3 Temperature mapping

The following section verifies if the appliance operates within the defined maximum temperature deviation and performance limits by performing temperature mapping.

Before starting up the appliance, place the test probes inside the appliance like illustrated on the previous page. Ensure that there is no gap around the cable of the test probes, enabling hot air to enter the appliance, as this may affect the performance of the appliance. If any gap is visual, it must be sealed.

We recommend to perform the temperature mapping in ambient conditions of +25°C and RH of 45 – 65 %.

PROCEDURE	RESULT	PASSED (YES/NO)
<p>Ensure that the calibration certificate of the measuring device is enclosed to this IQ/OQ</p>		
<p>Before starting up the appliance and temperature mapping, ensure acclimation of the appliance by making sure that the temperature of the appliance equals the ambient temperature.</p> <p>Start the temperature logging of the test probes.</p> <p>Turn on the appliance and let it run until stable condition is reached.</p> <p>Note the start time and start temperature.</p> <p>Default set point refrigerators: +5°C Default set point freezers: -20°C</p>	<p>Start time (appliance): Start temp. (display): Start temp. (test probes): Probe 1: Probe 2: Probe 3: Probe 4: Probe 5: Probe 6: Probe 7: Probe 8: Probe 9: Probe 10: Probe 11:</p>	
<p>Measure and note the ambient temperature to verify that is below the defined maximum.</p> <p>Max. ambient refrigerators: +32°C (+/- 2K) Max. ambient Freezer: +32°C (+/- 2K)</p> <p>Approval criteria <i>Ambient temp. ≤ the defined max. limit</i></p>	<p>Ambient temp.:</p>	

<p>Verify the pull down time from starting up the appliance until the set point is reached.</p> <p>Approval criteria (by ambient temp. of max. +25°C)</p> <ul style="list-style-type: none"> - Refrigerator: Pull down time of max. 1 hr. - Freezer: Pull down time of max. 3 hr. 	<p>Time of set point reach (time when the last test probe has reached the set point):</p> <p>Pull down time: (start time – time of set point reach)</p>	
<p>Verify if calibration of the appliance sensor is required.</p> <p>We recommend to calibrate the appliance sensor if a temperature deviation of more than 0,5°C between the test probe placed in the center of the appliance and the temperature shown on the display is found (customers own quality standards may define other requirements according to calibration, these shall then be valid).</p> <p>If calibration is performed, note the calibration value and repeat above steps. Calibration parameter: /c1</p> <p>Calibration requires the following field to be signed to confirm calibration has been performed:</p> <p>Date: _____</p> <p>Signature: _____</p>	<p>Temperature of test Probe (center of appliance):</p> <p>Display temperature:</p> <p>Temperature deviation:</p> <p>Note setting of calibration parameter: (if calibrated)</p>	
<p>Verify the temperature deviation of the appliance by comparing the maximum and minimum temperature measured during a period of min. 2 hours.</p> <p>Approval criteria Temperature deviation of max. 5K between the warmest and coldest temperature value measured.</p>	<p>Probe 1 Max. temp.: Min. temp.:</p> <p>Probe 2 Max. temp.: Min. temp.:</p> <p>Probe 3 Max. temp.: Min. temp.:</p> <p>Probe 4 Max. temp.: Min. temp.:</p> <p>Probe 5 Max. temp.: Min. temp.:</p> <p>Probe 6 Max. temp.: Min. temp.:</p>	

	<p>Probe 7 Max. temp.: Min. temp.:</p> <p>Probe 8 Max. temp.: Min. temp.:</p> <p>Probe 9 Max. temp.: Min. temp.:</p> <p>Probe 10 Max. temp.: Min. temp.:</p> <p>Probe 11 Max. temp.: Min. temp.:</p> <p>Max. temp. deviation (K):</p>	
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3.4 Alarm and temperature recovery verification

The following section verifies the alarm functions and the temperature recovery after door openings.

Before initializing and in between the following tests, allow the appliance to stabilize.

OPEN DOOR ALARM, REMOTE ALARM AND TEMPERATURE RECOVERY TEST

PROCEDURE	RESULT	PASSED (YES/NO)
<p>Verify the function of the door open alarm by performing the following steps.</p> <p>Connect an ohmmeter to the red and black remote alarm contact terminals 15 + 14 (N/C) placed on the rear side of the appliance.</p> <p>Note that the setting of the door open alarm bypass (parameter d8d) is 1 min.</p> <p>Open the door and note start time and start temperature. Leave the door open until the alarm activates (acoustic alarm and visual error code “dor” on the display).</p> <p>Verify that the ohmmeter registers and open connection.</p> <p>Note the time and display temperature of alarm activation.</p> <p>Close the door. The alarm disables automatically.</p> <p>Approval criteria</p> <ul style="list-style-type: none"> - Open door alarm: <i>Acoustic and visual alarm activation time according to the parameter setting of the open door alarm bypass (parameter d8d)</i> - Remote alarm: <i>open connection is registered</i> 	<p>Start time: Start temperature (appliance): Set point:</p> <p>Open signal (Y/N):</p> <p>Time of alarm activation: Display temperature by alarm activation:</p> <p>Time difference (min.): <i>(start time – time of alarm activation)</i></p>	
<p>Verify the temperature recovery time after door opening by performing the following steps.</p> <p>Let the appliance stabilize and thereafter open the door for 1 minute. Note the time of opening the door and the temperature of the test probe placed in the center of the appliance.</p> <p>When 1 min. has passed, close the door and note the time.</p> <p>Monitor the temperature of the test probe until it has reached a temperature value within the normal operating temperature (set point +/- hysteresis) and note the time and value.</p>	<p>Time of door opening: Start temperature (test probe placed in center of appliance):</p> <p>Time of door closing:</p> <p>Time of reaching a temperature value within the normal operating temperature (set point +/- hysteresis):</p> <p>Temperature of test probe:</p>	

<p>Calculate the recovery time and note it.</p> <p>Approval criteria Refrigerator recovery time of max. 20 min. Freezer recovery time of max. 40 min.</p>	<p>Recovery time: (Time of door closing – time of reaching a temper- ature value within the nor- mal operating temperature (set point +/- hysteresis)</p>	
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HIGH TEMPERATURE ALARM TEST

PROCEDURE	RESULT	PASSED (YES/NO)
<p>Verify the function of the high temperature alarm by performing the following steps.</p> <p>Let the appliance stabilize: Refrigerators: +5°C Freezers: -20°C</p> <p>Note the setting of the AH parameter.</p> <p>Open the door and wait until the high temp. alarm level (set point + AH value) is reached plus the time of the Ad (AH/AL delay) setting. During this process the door open alarm (dor) will be activated, however, this will not affect the high temp. alarm test.</p> <p>Approval criteria</p> <ul style="list-style-type: none"> - Refrigerator: Activation of the acoustic and visual HI alarm according to the AH (high temp. alarm) + Ad (AH/AL alarm delay) settings (= activation of alarms 5 minutes after reaching +13°C) - Freezer: Activation of the acoustic and visual HI alarm according to the AH (high temp. alarm) + Ad (AH/AL alarm delay) settings (= activation of alarms 5 minutes after reaching -17°C) 	<p>Note set point:</p> <p>AH setting:</p>	

3.5 Deviations to criteria of acceptance

If any deviations to the criteria of acceptance are found, the below table shall be filled out to document that a corrective action has been initiated and/or finalized.

In case of deviations, which cannot be corrected on site, please contact the distributor of the appliance for support in correction of the deviation(s).

DEVIATION REPORT

Deviation report no.	
Type of deviation	
Describe the deviation	
Describe the correction of the deviation	

CHECKED/TESTED BY	DATE	SIGNATURE

VERIFIED BY	DATE	SIGNATURE

4 Result of Installation and Operational Qualification

PRODUCT INFORMATION	
Manufacturer	
Model	
Serial number	

RESULT	CHECK (v)
Passed	
Failed	

CHECKED/TESTED BY	DATE	SIGNATURE AND STAMP

VERIFIED BY	DATE	SIGNATURE AND STAMP