

12 RESPONSIBLE
CONSUMPTION
AND PRODUCTION



Vestfrost Solutions is working towards reaching the UN - Global Sustainable Development Goals by 2030.

The Sustainable Development Goals are the blueprint to achieve a better and more sustainable future for all.

In order to implement Goal no 12 "Responsible Consumption and Production", this manual has been printed on recycled paper.



Health staff training and SOP's

Overview of Basic handling and
Preventive Maintenance Requirements
On-site Health Staff Training



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Health facility training requirements as per Unicef 's ToR

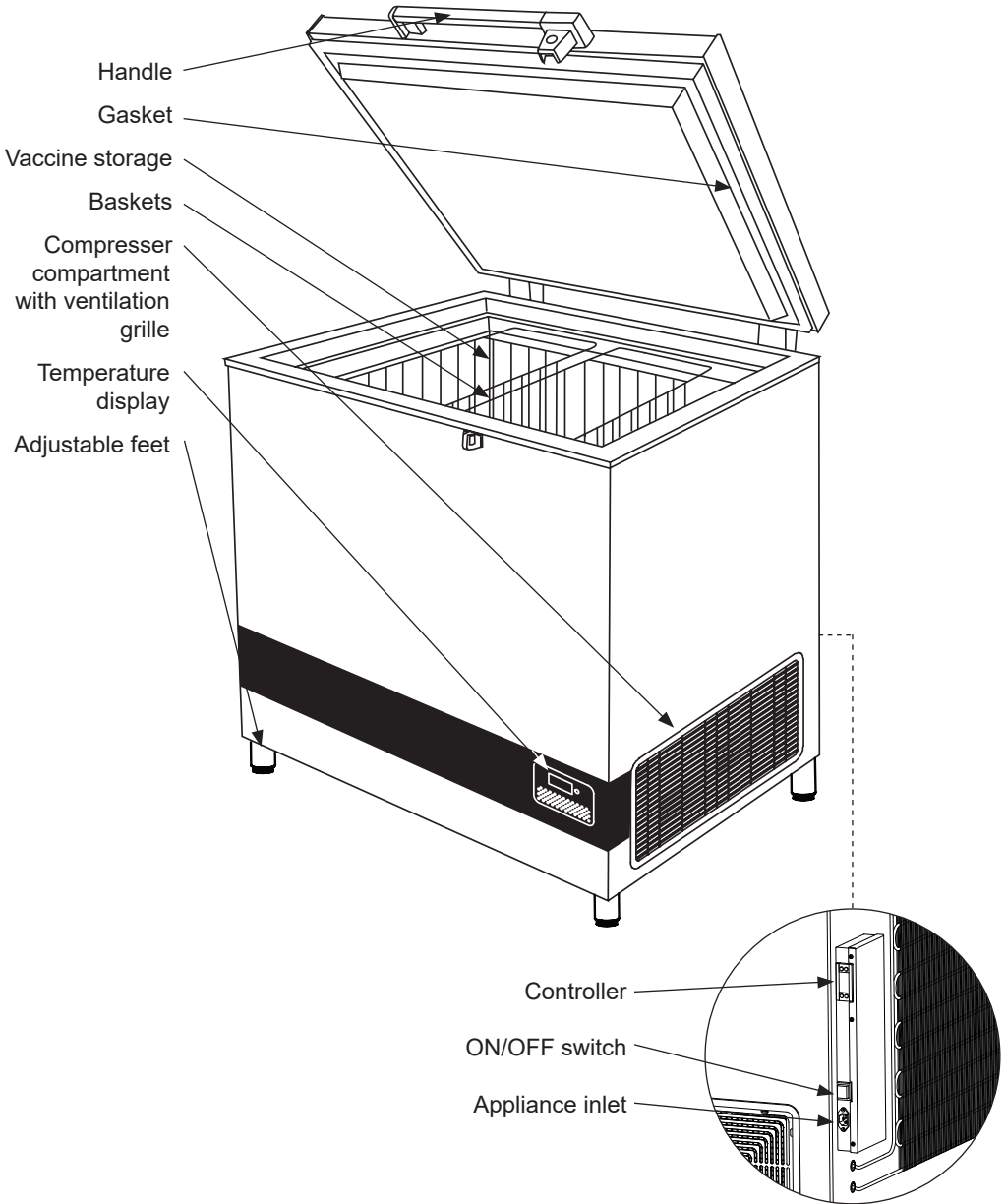
Basic handling and user level maintenance training on the equipment installed including monitoring and recording of temperature readings of 30 day temperature logger.

This training needs to be provided at the time of installation for all applicable CCE categories to the responsible personnel at the health facility, and any other person nominated by the MoH present on that day.

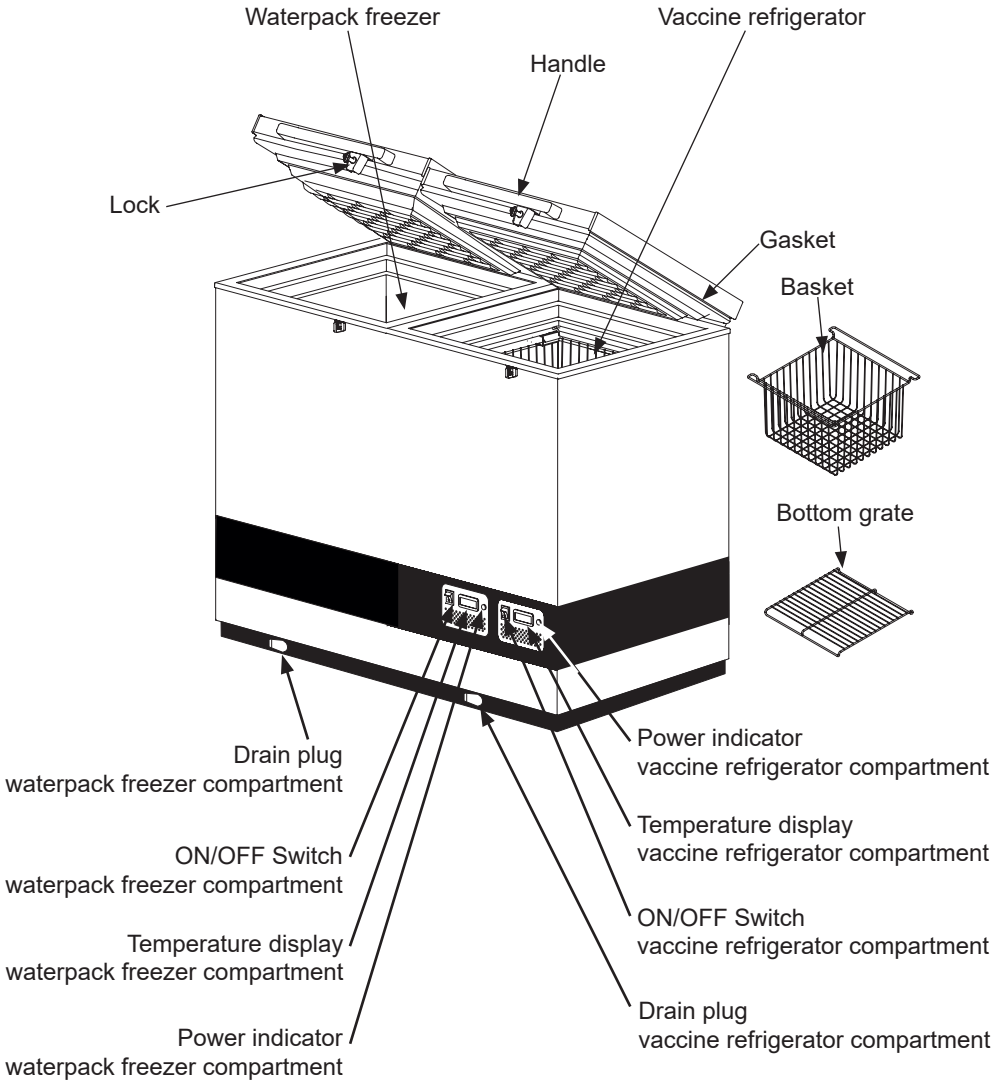
In the case of solar refrigerators that are considered 'maintenance free', a specific emphasis shall be made on the periodic cleaning of the solar panels.

- Capable of instructing HF staff
- Help to self-help
- District "assistants"
- Capacity building
- More confidence in instructing and presenting

Single chamber SDD/AC vaccine refrigerator



Combo SDD vaccine refrigerator - waterpack freezer



Recommendable Preventive maintenance tools

- Soft brush for cleaning condenser fins;
- Soft cloth for cleaning ;
- Mild soap detergent; (not for solar panels)
- Water bucket ;
- Plastic scraper (for safely removing ice build up);
- Condensate collection pan;
- For cleaning photovoltaic arrays with difficult access: long handle glasscleaning tools and/or ladder.

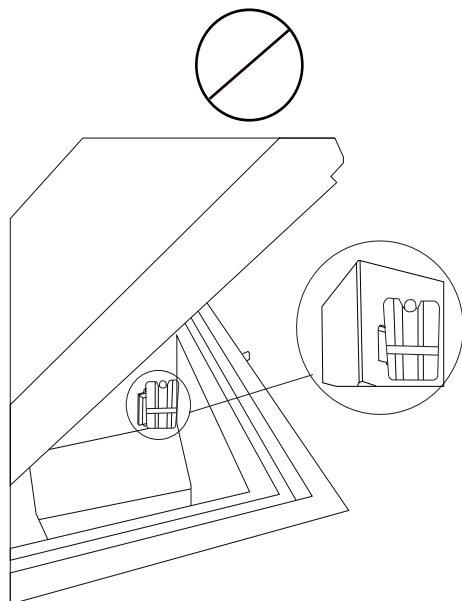
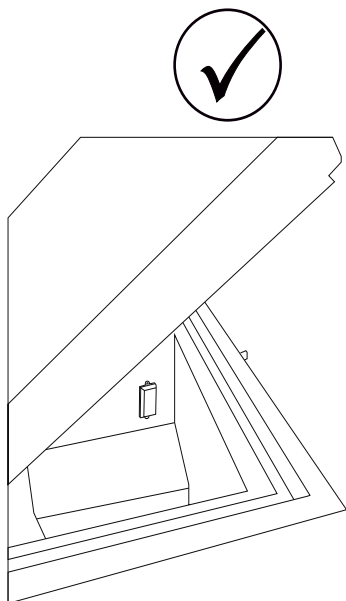
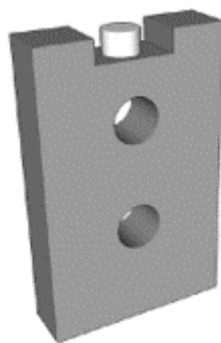


WARNING!

HIGHLY IMPORTANT!

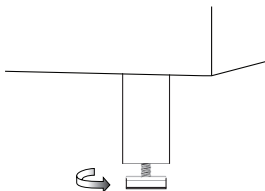
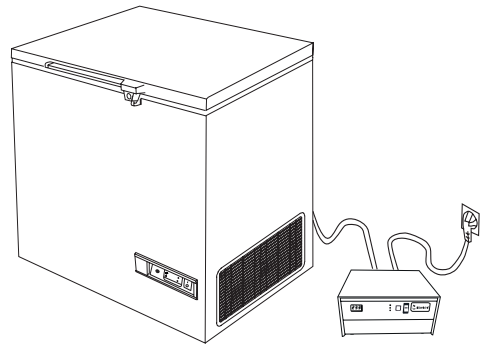
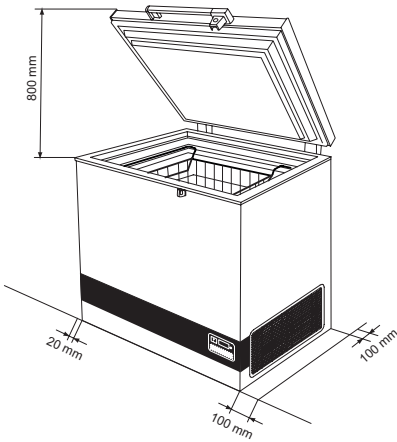
- Make sure NEVER to place any commodities up against the sensor cover.

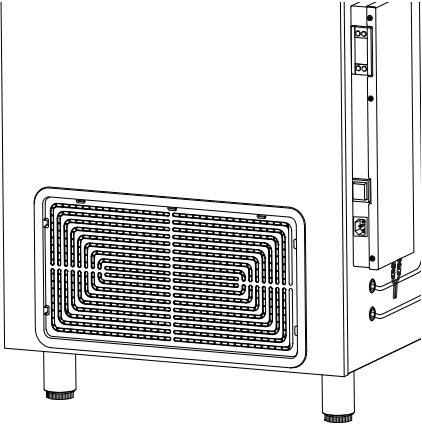
Eg. Water-pack



VLS vaccine refrigerator installation

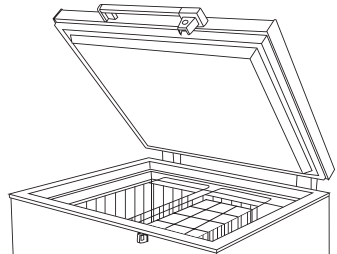
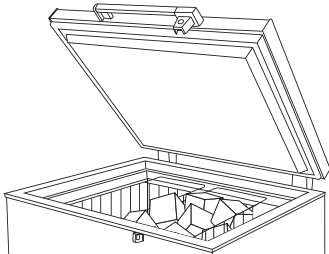
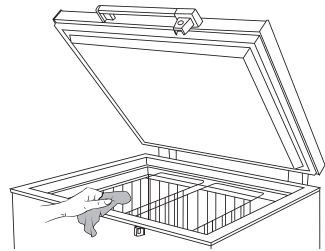
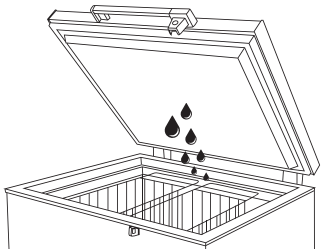
- The appliance must be placed in a well ventilated room
- Level the appliance by screwing the adjustable feet up or down
- Appliance NOT recommended to be installed in ambient temperature below 5°C
- There must be free access to the ventilation grille
- A good air circulation especially around the compressor is essential for trouble-free operation. Keep the ventilation openings of the compressor compartment always free from any obstructions
- Not to be installed in direct sunlight and away from other heating sources
- Voltage stabilizer to be used
- Appliance must be level to ensure proper function. Further ensure it is placed stable



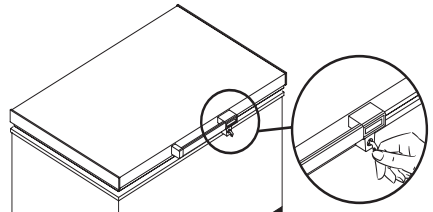
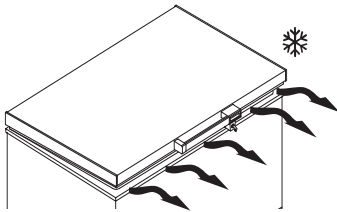
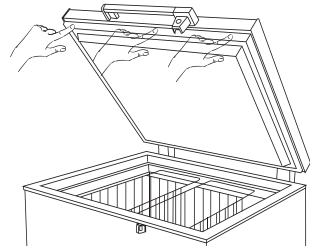
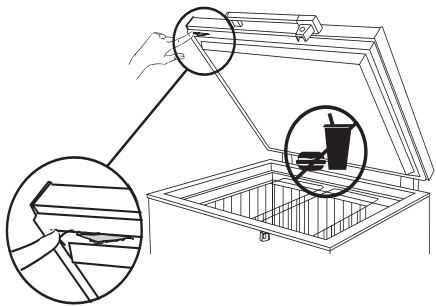


SOP's - Standard Operating Procedures

- Monitor temperature every morning evening on Fridge-tag 2
- Make sure appliance is dry, make sure it is cleaned inside outside min. every month.
- Keep the vaccine boxes containing the vaccines in neat rows with 2 cm. space between boxes of vaccines for circulation of air.



- Make sure lid gasket is not faulty
- No food or drinks to be stored in the vaccine compartment
- Do not open the door or lid unless it is essential to do so Frequent opening raises the temperature inside the refrigerator.
- Make sure lid fits and close tight to the cabinet
- Make sure to lock the fridge when not in use



SOP's - Standard Operating Procedures

Condensation management

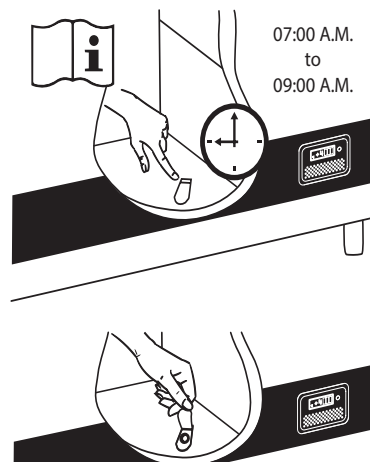
Condensation increases if

- Equipment is opened too frequently
- Lid not closing properly
- Lid gasket is defective
- High ambient temperatures

1. Disconnect the power supply
2. Open the drainage plug
3. Place a tray under the condensation water drain
4. Dry the vaccine compartment with a soft cloth, and make sure, no moisture is remaining after cleaning
5. Reinsert the internal drainage plug
6. Reconnect the power supply
7. When appliance has regained required safe temperatures for storing vaccines 2°C - 8°C , place the vaccines in neat rows with space

IMPORTANT!

Before condensation drainage vaccines must be moved to another working ILR or cold box with conditioned icepacks.



Condensation management

The vaccine refrigerator not sufficiently maintained.

Water is accumulating on the inner-lining, resulted in a water level of several cm. at the bottom of the vaccine compartment.

Condensation water should be avoided, and/or be removed on a regular basis or when needed.



If the level of condensation level is high in the vaccine compartment, the risk of growth of mold and other unwanted contents will increase extremely.

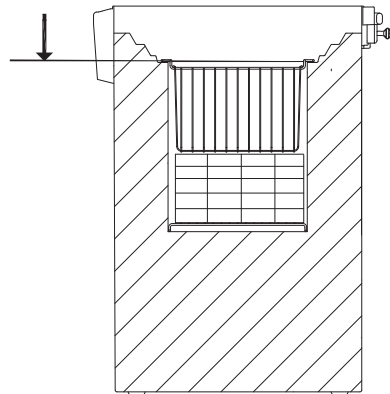
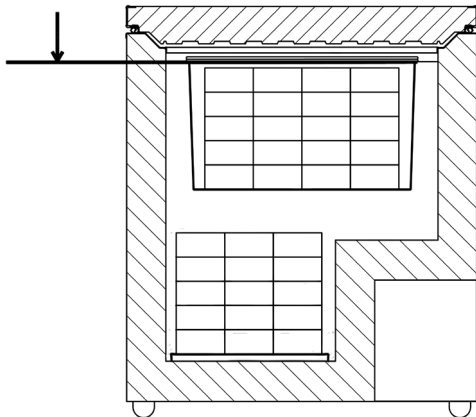
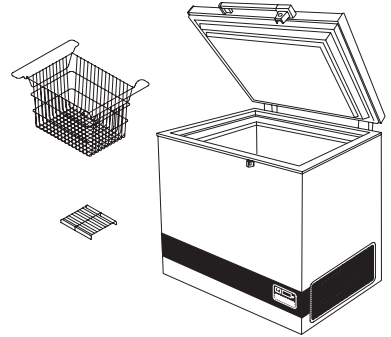
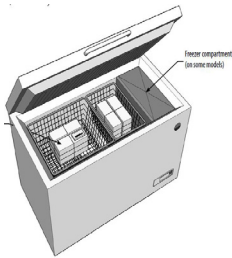


Loading a VLS vaccine refrigerator

IMPORTANT!

Not to be loaded with vaccines before the unit has been commissioned

- Always make sure temperatures in vaccine compartment are stable by CCE technician within $+2^{\circ}\text{C}$ and $+8^{\circ}\text{C}$
- Use Baskets and Bottom gratings supplied with refrigerators
- Store vaccines neatly. Leave space of 2 cm between rows for air circulation.
- Do not load the vaccine above top of the basket
(For specific types see instruction manuals)
- No expired vaccines in refrigerator; Remove expired vaccines
- First expired, First out!
- Organize so earliest expiry is easiest to reach
- Split up stock with different expiry dates
- Keep a “use first box” for vaccines with early expiry dates, late VVMs
(For specific types see instruction manuals)



Dont's

- Very poor vaccine management.
- Vaccines are not kept in boxes
- Old vaccines not removed. Vaccines not kept in order
- Baskets and bottom gratings not in use
- Vaccine compartment not properly cleaned
- Condensation/water not properly removed



Do's and Dont's

Wrong vaccine storage

- Baskets removed, not in use
- No space for air circulation between vaccine boxes
- Overloaded
- Vaccine boxes touching the wall, high risk of carton boxes to get soaked in water, high risk of mold build-up
- Poor capability of proper vaccine management



Correct vaccine storage

- Baskets in use
- Sufficient air circulation between vaccine boxes
- Proper vaccine management



VLS vaccine refrigerator cleaning

IMPORTANT!

Before servicing or cleaning the appliance, disconnect it from power source.



Daily Check:

The temperature in the vaccine compartment must always be monitored on the thermometer every day. Please note that the vaccine in the appliance must not freeze.

Weekly maintenance:

During normal use, water can accumulate at the bottom of the appliance; remove with a cloth or through the drainage hole.

Wipe off water droplets on the inside wall at the same time.

Check if lid gasket is sealing tight to the top frame when the lid is closed. A tight sealing lid reduces accumulation of water and formation of rime significantly.

Monthly maintenance:

Clean the grille on the right side of the refrigerator once each month. Clean vaccine compartment with lukewarm water and mild detergent. Clean outside of refrigerator with lukewarm water and mild detergent.

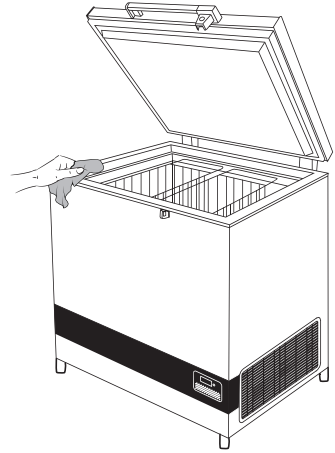
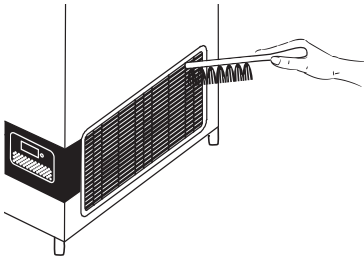
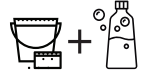
Yearly maintenance:

Electric connections and components are to be checked and cleaned once a year or more if necessary.

Cleaning:

Disconnect the power supply before cleaning. The best way to clean the appliance is by using luke warm water with a small amount of unscented detergent. Never use cleaning agents that scour. Use a soft cloth. Rinse with clean water and dry thoroughly. It is important to prevent water from running into the control panel.

The gasket around the lid must be cleaned regularly to prevent discoloration and prolong service life.



Dont's

If the vaccine refrigerators are not properly cleaned inside as well as outside on a regular basis, there is a high risk this could lead to eg. undesired mold growth on inner-outer cabinet, and lid-seals.

Lack of proper cleaning procedures of the vaccine refrigerator could further lead to unwanted germs, inside as well as outside of the appliance, and could also affectW the expected cooling performance of the equipment.



Basic maintenance VLS Energy System

Weekly maintenance:

- The solar panels are to be cleaned for dust once each week or as required.

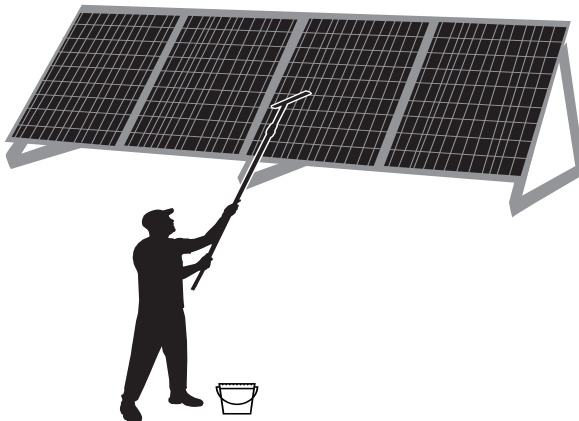
Monthly maintenance:

- Avoid shading
- It should be regularly monitored that shades do not come up such as new towering trees, as this will decrease the amount of energy produced by the system.

How to perform proper Cleaning of PV Panels

- Solar panels can become incredible hot in sunshine. Either clean your solar panels in the morning/afternoon, or pick a relatively cool day.
- Fill a bucket or spray bottle with warm water and soap no other special equipment is needed.
- Clean the surface of the solar panels.
- Cleaning must be carried out with water using a soft cloth/sponge or wash rag. You do not have to clean the wiring underneath.

Show extra caution if cleaning your solar panels requires you to climb up on the roof. Consider getting professional solar panel cleaners to do the job.



Yearly maintenance:

- Electric connections and components are to be checked and cleaned at least once a year or more often if required.
- Checking that PV panels are clean, free of fractures, scratches, corrosion, moisture penetration and browning.
- Cabling should be checked to ensure it is secure.
- Checking the mounting hardware to ensure it is in good condition and ensuring the earth connection is continuous
- Checking of junction boxes to ensure there is no water accumulation and that the integrity of lid seals, connections and clamping devices is intact.

IMPORTANT!

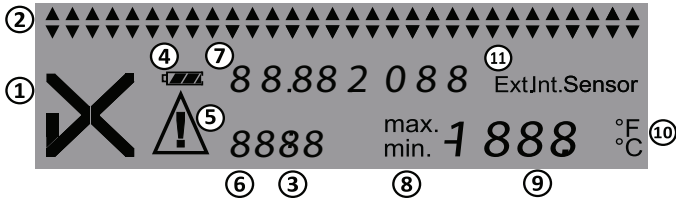
Fridge-tag 2 data logger

Fridge-tag 2 functions

1. Visible display
2. Alarm settings
3. SET button
4. Unique identification number
5. READ button
6. Day indication
7. USB port



1. Display explanations

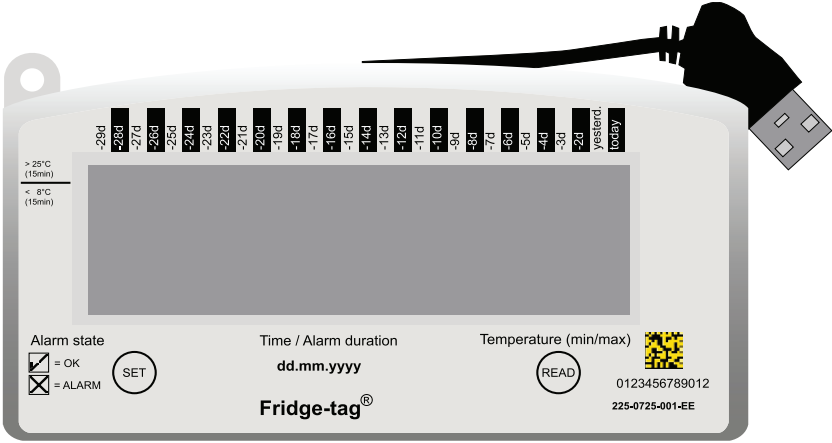


1. ✓ (OK symbol) or ✕ (alarm symbol)
2. Daily HIGH / LOW alarm indicators ▲▼
3. (showing the history of the last 30 days)
4. Power indicator (colon is flashing)
5. Additional warning symbol ! ⚠
6. Time, duration and text display
7. Date and text display
8. Display of measured minimum / maximum temperature
9. Temperature display
10. Display of the temperature measurement unit (°F/°C)
11. Display of the activated sensor:
 Int. = internal sensor
 Ext. = external sensor (cable with temperature sensor)

Note: All illustrations in the User Manual refer to the Fridge-tag with internal sensor. Differences between internal and external sensors are additionally described.

2. State of delivery / sleep mode

The Fridge-tag is shipped in sleep mode.

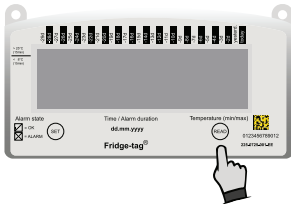


The display (LCD) is blank.

3. Read out information prior to activation (in sleep mode)

The following page shows which information will be indicated on the screen upon successive READ button pressings while in sleep mode.

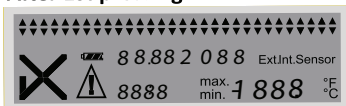
Note: After approx. 60 seconds without pressing any button on the Fridge-tag the device goes back into sleep mode; the display is blank again.



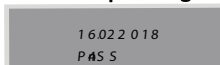
Press repeatedly READ to gather information.

Pressing the READ button

After 1st pressing of READ



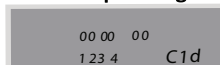
After 2nd pressing of READ



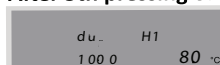
After 3rd pressing of READ



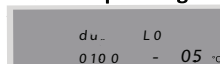
After 4th pressing of READ



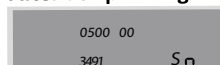
After 5th pressing of READ



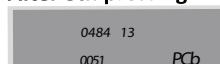
After 6th pressing of READ



After 7th pressing of READ



After 8th pressing of READ



After 9th pressing of READ



After 10th pressing of READ



Displayed Information

Display test:
all segments activated

Indication of date and production test result: 16 February 2018 / PASS (quality check passed)

Indication of the current temperature and which sensor is activated (internal / external). Display shows --.°C if external sensor is not connected.

Indication of configuration ID (e.g. 1234)

Indication of upper alarm settings. Example shows duration and temperature limits: 10 hours, >+8°C, high

Indication of lower alarm settings. Example shows duration and temperature limits: 1 hour, <-0.5°C, low

Serial number of the device

PCB number
(manufacturer information)

Battery power:
3 bars = full (>70%)
2 bars = half-full (30–70%)
1 bar = low (0–30%)**
** Device should be replaced.

The display is blank again.

4. Placing the Fridge-tag

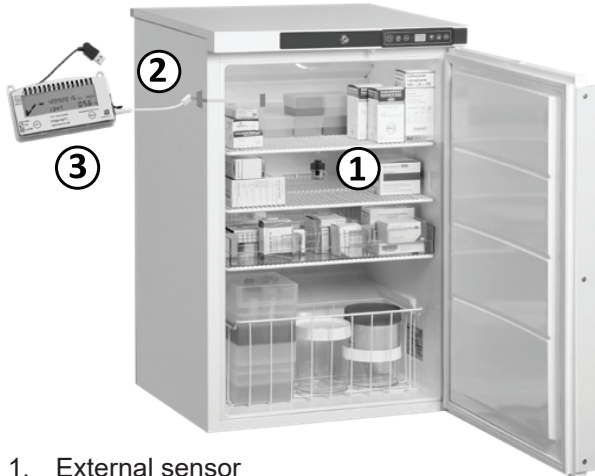
Placing the Fridge-tag with an internal sensor

The activated Fridge-tag must be placed immediately after activation (see chapter 5.) in its predetermined location. It is recommended and important to place the device in the center of the refrigerator for an optimal temperature observation. Please do not place the device into a freezer as the screen will freeze and the battery will lose power prematurely.

Placing the Fridge-tag with an external sensor

Two hours before activating the Fridge-tag the external sensor must be placed in its predetermined location. It is recommended and important to place the external sensor in the center of the refrigerator for an optimal temperature observation and to avoid any incorrect measurements when starting the device.

For the right positioning of the external sensor within the fridge, please follow the instructions of WHO, CDC or any other governmental requirements of your country.



1. External sensor
2. Flat cable
3. Fridge-tag

2 Read out Dokument of the Q-tag Fridge-tag® 2

PDF document of the Fridge-tag® 2

Identification number: 1234
 Date and time of report creation: 3.12.2012 10:05h
 Upper alarm limit: Above +8.0°C for 60min
 Lower alarm limit: Below +2.0°C for 60min
 Low battery since: 25.11.2012

No.	Date (dd.MM.yyyy)	Lower alarm limit			Upper alarm limit			Ext. sensor connection error			Signature / notes	
		Events*	Average temp.	Status	Min. temp.	Duration out of range	Alarm trigger time	Alarm ambient temp.	Status	Duration		Alarm trigger time
1	Today		+4.6°C	In progress	+4.1°C	0min		In progress	+5.3°C	0min		
2	02.12.2012		+4.5°C	ok	+4.0°C	0min		ok	+5.3°C	0min		
3	01.12.2012		+4.5°C	ok	+4.0°C	0min		ok	+5.2°C	0min		
4	30.11.2012		+4.3°C	ok	+3.9°C	0min		ok	+5.4°C	0min		
5	29.11.2012		+2.2°C	ALARM!	-1.5°C	2h 30min	06:05h	ok	+3.3°C	0min		
6	28.11.2012		+3.4°C	ok	+2.8°C	0min		ok	+3.8°C	0min		
7	27.11.2012		+3.4°C	ok	+2.8°C	0min		ok	+3.9°C	0min		
8	26.11.2012		+3.5°C	ok	+2.9°C	0min		ok	+4.1°C	0min		
9	25.11.2012		+4.6°C	ok	+4.1°C	0min		ok	+5.3°C	0min		
10	24.11.2012		+4.5°C	ok	+4.0°C	0min		ok	+5.2°C	0min		
11	23.11.2012		+4.5°C	ok	+4.0°C	0min		ok	+5.1°C	0min		
12	22.11.2012		+4.3°C	ok	+3.9°C	0min		ok	+5.1°C	0min		
13	21.11.2012		+4.6°C	ok	+4.1°C	0min		ok	+5.2°C	0min		
14	20.11.2012		+4.5°C	ok	+4.0°C	0min		ok	+5.3°C	0min		
15	19.11.2012		+4.5°C	ok	+4.0°C	0min		ok	+5.2°C	0min		
16	18.11.2012		+4.3°C	ok	+3.9°C	0min		ok	+5.1°C	0min		
17	17.11.2012		+4.6°C	ok	+4.1°C	0min		ok	+5.1°C	0min		
18	16.11.2012		+4.5°C	ok	+4.0°C	0min		ok	+5.2°C	0min		
19	15.11.2012		+10.5°C	ok	+4.5°C	0min		ALARM	+20.5°C	3h 0min	22:00h	
20	14.11.2012		+12.5°C	ok	+4.5°C	0min		ALARM	+20.5°C	7h 15min	01:00h	
21	13.11.2012		+4.6°C	ok	+4.1°C	0min		ok	+5.2°C	0min		
22	12.11.2012		+4.5°C	ok	+4.0°C	0min		ok	+5.1°C	0min		
23	11.11.2012		+2.5°C	ok	-1.0°C	30min		ok	+5.1°C	0min		
24	10.11.2012		+4.3°C	ok	+3.9°C	0min		ok	+5.2°C	0min		
25	09.11.2012		+4.6°C	ok	+4.1°C	0min		ok	+5.3°C	0min		
26	08.11.2012		+4.5°C	ok	+4.0°C	0min		ok	+5.2°C	0min		
27	07.11.2012		+4.5°C	ok	+4.0°C	0min		ok	+5.1°C	0min		
28	06.11.2012		+4.3°C	ok	+3.9°C	0min		ok	+5.1°C	0min		
29	05.11.2012		+4.6°C	ok	+4.1°C	0min		ok	+5.2°C	0min		
30	04.11.2012		+4.5°C	ok	+4.0°C	0min		ok	+5.3°C	0min		

Signature: _____

Date and place: _____

*1 = time / date changed, b = battery changed, a = alarm configuration changed

Voltage stabilizer Sollatek SVS04

- Every refrigeration unit must be connected to an individual stabilizer.
- Bypassing of Stabilizer is not recommended, as such practice may lead to damage of the CCE & in turn safety of vaccines & hence must be avoided.
- Proper earthing should be available and connected.
- Emphasize on repairing stabilizers immediately. Identify authorized Vestfrost service provider in case of technical assistance is required.
- Clean the stabilizer regularly for dust using a small broom



Protection from



High voltage



Low voltage



Spikes/surges



Power Back Surges



Class III surge/spike

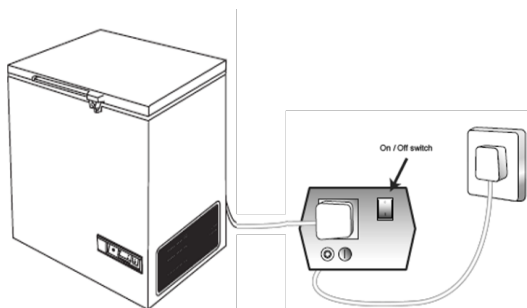
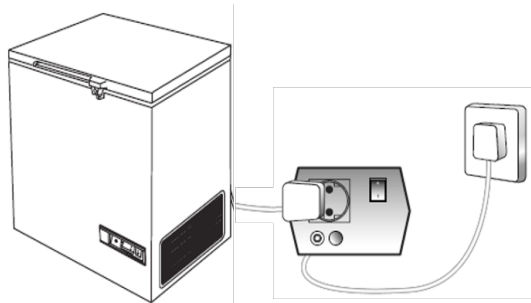
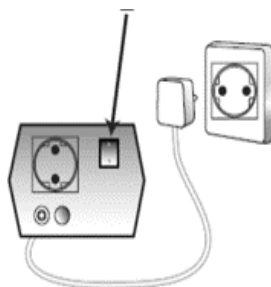
INPUT AND OUTPUT VOLTAGE RESPONSE FOR STANDARD MODELS

230V																					
Input	0-144	145	155	165	175	185	195	205	210	215	225	235	240	245	255	265	275	285	290	291	
Output	OFF	182	196	208	221	233	221	232	237	215	225	235	240	218	228	237	248	255	259	OFF	
115V																					
Input	0-72	73	78	83	88	93	98	103	105	108	113	118	120	123	128	133	138	143	145	146	
Output	OFF	91	98	104	111	117	111	116	119	108	113	118	120	109	114	119	124	128	130	OFF	

Voltage stabilizer installation procedure

Important!

Proper earthing should be available and connected.



Technical Manual´s - Trouble shooting SDD

Fault	Possible cause	Remedy
Compressor is not running.	Be patient, it is most likely that the compressor will start within a few minutes.	<p>If this is not the case, check the following:</p> <ul style="list-style-type: none"> - Check that power is connected and that the wire from the solar panel to the appliance is intact. - Check the fuse and replace it if necessary. - If the above is OK, call technical supervisor.
Compressor is running, and the temperature is too high.	<p>The ventilation grille is blocked.</p> <p>The lid is not closed properly.</p> <p>The fan in the compressor compartment is blocked or defective.</p> <p>The temperature in the room in which the appliance is installed is too high.</p>	<p>Ensure unhindered air circulation.</p> <p>Ensure that the lid is closed properly.</p> <p>Check that the fan is running, if not it should be replaced.</p> <p>Shield the appliance against direct sun light and ensure more ventilation to the room.</p>
Temperature in VLS SDD is too low.	To low set point on digital controller.	Turn to page 23/24 in terms of getting details on how to adjust thermostat setpoint.
No temperature is displayed.	There is not enough light for the solar sensor.	Turn on the light.
No light in green diode during day time.	<p>Switch is turned OFF</p> <p>Fuse is burned</p> <p>Diode is defect</p>	<p>Turn on the switch.</p> <p>Replace the fuse.</p> <p>Replace diode.</p>

Technical Manual´s - Trouble shooting A AC

Fault	Possible cause	Remedy
Compressor is not running	Be patient, it is most likely that the compressor will start within a few minutes.	If this is not the case, check the following: - Check that power is connected - Check the fuse and replace it if necessary. - If the above is OK, call technical supervisor.
Compressor is running, and the temperature is too high	The ventilation grille is blocked. The lid is not closed properly. The temperature in the room in which the appliance is installed is too high.	Ensure unhindered air circulation. Ensure that the lid is closed properly. Shield the appliance against direct sun light and ensure more ventilation to the room.
No temperature is displayed	The micro processor control unit is broken Power not connected	Change the micro processor control unit. Check power outlet - Check power plug is connected.

If Technical support is required

- VF “Authorized Sales & Service Partner” is your technical partner
- VF “Authorized Sales & Service Partner” is provider of genuine and correct spare parts
- VF “Authorized Sales & Service Partner” is efficient and reliable
- VF “Authorized Sales & Service Partner” can be used to improve your knowledge
- Contacts E-mail/Phone no. can be found on the Service Sticker placed at the front of the appliance



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Authorized Sales & Service Partner? Area?

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Service E-Mail: servicecontractors@service.com

Service partner label
location
To be placed below QR
front sticker



