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SUPPLY DIVISION

COLD CHAIN

SUPPORT PACKAGE

PROCUREMENT GUIDELINES

WALK-IN COLD ROOMS AND FREEZER ROOMS

Procurement Guidelines

Walk-In Cold Room (WIC)

Walk-In Freezer Room (WIF)

Key information for UNICEF staff and partners, ensuring the effective and efficient procurement of Cold Chain equipment.

This module gives guidance to the procurement of Walk-In Cold Rooms and Walk-In Freezers for vaccine storage.

Always make sure that you have the latest version of this document by checking the CCSP website.

Document Update: September 28, 2020

Suggestions and feedback: sd.coldchain@unicef.org

Contents

Acronyms

CCSP	Cold Chain Support Package
CO	Country Office
DOA	Direct Order Arrangement
DVDMT	District Vaccination Data Management Tool
EPI	Expanded Programme of Immunization
EVM:	Effective Vaccine Management
LTA	Long Term Arrangement
PHC	Primary Health Care
PQS	Performance Quality and Safety
PQT	Prequalification Team
PO	Purchase Order
PS	Procurement Services
SD	Supply Division (UNICEF)
SMT	Stock Management Tool
WHO	World Health Organization
WIC	Walk-In Cold Room
WIF	Walk-In Freezer Room

1 Needs Identification

1.1 Introduction

Walk-In Cold Rooms (WIC) and Walk-In Freezer Rooms (WIF) are refrigerated enclosures accessible via at least one door and large enough for a person to walk into, housed within existing buildings. WICs and WIFs are an important storage point in the temperature-controlled supply chain and usually used at the central or national level. In some countries they are also used at the regional or district level.

The decision to acquire WICs and/or WIFs should be based on several considerations. Most important are the current existing storage capacities for vaccines and the anticipated future storage requirements, especially in view of the introduction of new vaccines. The procurement of Cold Chain equipment should be based on national policy, Expanded Programme of Immunization (EPI) strategies and according to planned national asset acquisition and replacement policies. Acquiring WIC/WIFs calls for the involvement of EPI managers and logisticians to determine required storage capacities.

WIC and WIF are supplied disassembled and they require installation and commissioning. To ensure timely installation of WIC and WIF, it is critical that the implementation site is ready when WIC and WIF components arrive and that this whole process is managed as a project by the UNICEF country office.

1.2 Cold Rooms and Freezer Rooms Supplied by UNICEF SD

UNICEF Supply Division (SD) only supplies WIC/WIFs that fulfil the quality requirements set by WHO PQS, documented in the 'Category Documentation' published for E001 Cold rooms, freezer rooms and related equipment.[1]

SD procures five WHO standard sizes with two types of cooling units (mono block & split type) via Long Term Arrangements (LTAs)[2]:

Table 1. WIC/WIFs Available on LTA

WIC/WIF Type	Cooling Unit Type	
Cold Room, Walk-In Type, 10 m^3	Monoblock	All these prefabricated WIC/WIFs are being supplied with all necessary mechanical and electrical fittings.
Cold Room, Walk-In Type, 30 m^3	Monoblock & Split Type	
Cold Room, Walk-In Type, 40 m^3	Monoblock & Split Type	
Combined Walk-In Cold/Freezer, 40 m^3 (25 m^3 WIC /15 m^3 WIF) [3]	Monoblock & Split Type	
Freezer Room, 20 m^3	Monoblock & Split Type	

SD is also able to assist with the supply of non-standard sized rooms. However, requests for non-standard sized WICs/WIFs normally require additional time since the procurement is done through spot tendering. Supplier lead times, in this case, may be longer than for LTA standard-sized rooms. As part of SD's technical

[1] UNICEF SD procures pre-qualified and listed equipment that conform to WHO standards. These standards are documented in the WHO PQS (Performance, Quality and Safety) manual, which is accessible online.
[2] UNICEF SD establishes Long Term Arrangements (LTAs) with suppliers, usually for a period of 24 months. Refer to the document General Procurement Guidelines for Cold Chain Equipment for further details on LTAs.
[3] These numbers refer to the capacity of the cold room section and the freezer room section in a combined 40 cbm WIC/WIF respectively.

review of incoming country requests, the Cold Chain Unit (CCU) technical team may suggest standard sized WIC/WIF instead non-standard rooms, in case compliant with requirements and better suited in terms of delivery times and cost effectiveness.

1.3 Types of WICs and WIFs

Two distinct types of WICs and WIFs exist:

a. Plug-in Model

A plug-in product has the controls, the compressor, the condenser and the evaporator as a complete unit, assembled and ready for installation. Each WIC/WIF is supplied with two complete plug-in refrigeration units to provide 100 per cent stand-by cooling. These are hung on the prefabricated panel walls of the WIC/WIF or mounted on the ceiling panels.

- Advantages:
  - Faster and easier to assemble
  - Does not require extra wiring, piping and connection cabling

- Disadvantages:
  - Requires sufficient ventilation as the refrigeration units generate hot air in the vicinity of the cold room which affects the efficiency of the refrigeration system.
  - In humid countries this could cause formation of condensate in WICs with the potential for vaccine wastage as a result of peeling of labels on vaccine vials.
  - Isolation of the condenser section is recommended which requires it to be fitted with ducting and air extractor fans to remove hot air from the room within which the WIC or WIF is installed.
  - Noise generated from the condenser/compressor may cause disturbance.

b. Split-Unit Model

Unlike the Plug-in refrigeration units, the split unit refrigeration model consists of two main parts: (1) the condensing component for installation outside the room where the WIC/WIF is installed, and (2) the evaporator component installed inside the room. At the site of installation, these parts are linked with solid leak proof connection tubing between the evaporator and the condensing unit.

- Advantage:
  - The condensing unit can be located where noise generated from the condenser/compressor causes minimal disturbance, and where heat emissions generated by the compressor and condenser units do not affect the ambient temperature of room where the equipment is installed.

- Disadvantages:
  - Not operational on receipt from the supplier as the condensing and evaporating components need to be installed in two different locations.
  - Require that wiring and piping connections are made and charged with refrigerant gas after installation.
  - The installation process requires an experienced refrigeration technician to ensure leak proof connections as well as the electrical wirings and refrigerant gas charging.

2 Budgeting

For information about budgeting for procurement, refer to the General Procurement Guidelines for Cold Chain Equipment.

3 Ordering

3.1 Starting the Process

Refer to the General Procurement Guidelines for Cold Chain Equipment and the UNICEF SD Procurement Services website for general guidance on how to order Cold Chain products and services. If the General Guidelines for Cold Chain Equipment does not provide sufficient information, please contact the Supply Division Procurement Services for specific queries.

The option of ordering installation services through UNICEF SD is discussed in Section 6 of this document.

3.2 Delivery Lead Times

Refer to the section 'When to Order' in the document 'General Procurement Guidelines for Cold Chain Equipment', or contact SD to receive estimated manufacturing and shipment times.

3.3 Technical Considerations

a. Standard Requirements for WIC and WIF

The WIC & WIF product specifications, which are being procured by SD are aligned with the WHO PQS specifications. For full WHO PQS specifications, please refer to the WHO PQS Catalogue.

b. Dimensions and Power Consumption

An important consideration is whether the WIC/WIF ordered will fit into the allocated room (including height), allowing for enough space for access and ventilation. Consult the UNICEF Supply Catalogue to see the dimensions of each cold and freezer room available under LTAs. Power consumption of standard WICs and WIFs are being advised via technical screenings made by the Cold Chain Unit technical team when an inquiry is received from a partner or a Country Office. The purpose of these parameters is to assist in pre-installation prepositioning, advice on power requirements and programmatic planning for energy costs for running the WICs and WIFs.

c. Generator

In some locations, the electricity supply for the WIC/WIF is not stable and reliable. The WHO PQS stipulates that the electric power supply should be maintained for WIC/WIF to operate properly and maintain the appropriate temperature to safeguard the vaccines. WHO and UNICEF recommend that all primary vaccine stores should be fitted with a generator with automatic start up, regardless of the reliability of the mains power supply.

c. Weight and Volume Factors

The SMT / DVDMT and the WHO's EVM Assistant User Guide[4] will help you identify the size and net storage capacities of WICs and WIFs. Estimated weights and volumes for standard WICs/WIFs are listed in the item specifications in the UNICEF Supply Catalogue (click on each WIC and WIF material for detailed information).

[4] World Health Organization. (2010) EVM Assistant User Guide. https://www.who.int/immunization/programmes_systems/supply_chain/EVM-assistant-tool.pdf

Please note that WICs and WIFs should be installed with adequate space to allow for adequate air circulation and be protected against adverse weather conditions. '4.9.3 Installation requirements and constraints' sub-chapter in WHO's Guideline for establishing or improving primary and intermediate vaccine stores[5] can be referred to ensure these considerations are addressed properly.

d. Manufacturers Product Manuals

The UNICEF SD Cold Chain Unit has electronic versions of Manufacturers' Manuals, including Installation, User and Technician Manuals. These manuals are being supplied with the WIC and WIF orders and can be shared with partners. Partners can contact UNICEF SD Cold Chain Unit in order to ask for electronic copies of these manuals.

3.4 Recommended Additional Components

UNICEF is supporting the following WHO recommended components for vaccine stores to meet international norms for WICs and WIFs. Consequently, WICs and WIFs supplied by UNICEF should be installed together with the following additional components:

a. Remote Temperature Monitoring Device (RTMD)

The WHO PQS recommends an RTMD to be installed as standard with WICs and WIFs in order to continuously monitor vaccine storage conditions. The RTMD should comply with WHO PQS specifications for Programmable Remote Temperature and Event Monitoring Systems (E006/TR3), designed with the following functionality:

- RTMDs monitor temperatures at the most important locations within the vaccine storage compartment, along with other critical parameters such as door open/close status, electric mains power availability and ambient temperature.
- All temperatures and other important parameters are displayed on the device and local operators are notified of any alarm conditions via a visual and audible alarm system.
- All measurement data is automatically uploaded via mobile networks to an internet-based dashboard for analysis and reporting, while alarm conditions are automatically sent to focal points via SMS or email. This ensures that continuous historical temperature and performance data is available on a centralized database for review, while alarm recipients are immediately notified of any temperature excursions in order to take corrective action.

More detail on RTMDs can be found in the UNICEF Cold Chain Support Package - Temperature Monitoring Devices, while information on products available under LTAs can be found in the UNICEF Supply Catalogue.

b. Voltage Stabilisers

WICs and WIFs have sensitive electronic components and control systems that are susceptible to power fluctuations. Compressors and other electronic components only operate reliably within a specific input voltage range, while mains electricity input voltage is frequently outside this range. Lightning strikes and intermittent mains electricity power supply, coupled with stand-by generator start-up and shutdown, often result in significant surges and transients. These events are detrimental to sensitive electronic components and accessories, leading to premature failure and consequently, that of the WICs or WIFs.

[6] World Health Organization. (2002). Guideline for establishing or improving primary and intermediate vaccine stores. World Health Organization. https://apps.who.int/iris/handle/10665/67807

It is therefore recommended to always equip WICs and WIFs with voltage stabilizers that stabilize the input voltage, provide protection against surges and transients, and only allow power to the equipment when pre-set conditions are being met. Voltage stabilizer capacity/rating is determined according to the size of the WIC or WIF, the cooling units plus accessories, and the number of mains power phases. Please see below approximate guidance on stabilizer capacity/rating according to these parameters:

Type [WIC/WIF]	WIC/WIF Size [m^2]	Mains Power [Single/Three Phase]	Voltage Stabilizer Capacity [kVA]
WIC	10	Single	10
WIF	20	Three	20
WIC	30	Three	15
WIC	40	Three	15
WIC&WIF Combi.	40 (25WIC+15WIF)	Three	20

More detail on Voltage Stabilizers can be found in the UNICEF Cold Chain Support Package – Accessories: Voltage Stabilizers, while information on products available under LTA can be found in the UNICEF Supply Catalogue.

3.5 Ordering Spare Parts

One set of spare parts is supplied with each WIC/WIF order as a standard. The list of spare parts for each WIC and WIF model can be reviewed by referring to UNICEF Supply Catalogue. You can contact UNICEF-SD Cold Chain Unit to get more information regarding WIC/WIF spare parts.

4 Site Preparation

4.1 Site Readiness for Installation

The importance of site readiness cannot be over-emphasized. Cold Rooms are bulky items that require special care and consideration during the pre-installation period.

COs and Procurement Services (PS) partners are advised to consider the following instructions for site readiness to allow for the contracted technician(s) to start the work immediately upon arrival at the installation site:

1. The building should be designed and constructed to a good standard to suit local climatic conditions. It must have suitable finishes, adequate ventilation, and correct electricity supply.
2. The MOH/UNICEF CO focal point shall assure before the contractor starts the works that the site is completely ready for the cold and freezer rooms to be installed.
3. The concrete flooring onto which the cold rooms have to sit need to be a levelled and even surface;
4. Drainage system to evacuate the water coming from the cold room as a result of defrosting/ condensation should be in place.
5. The power supply cables, for supply in 3 phases + Neutral + Earth, protected by circuit breaker and by 30 milliamps differential
6. Earthing/grounding must be tested for validating compliance to the electricity standards of the Country, where the WIC/F will be installed, ensuring that the grounding/earthing is safe enough for the personnel/equipment.

7. It should be ensured that all WIC/WIF components are on site and located within carrying distance from the final installation area before arrival of the technician (if the supplier is carrying out the installation);
8. All components should be stored in a covered and secured area, protected from excessive heat;
9. Ensure that the intended installation site is cleared and ready for immediate installation to commence;
10. Equip installation space with adequate ventilation/windows which can be opened on top of existing wall(s) with netting/burglar proof grills;
11. The door entrance to the installation area should be at least 900 mm wide to allow access for the prefabricated panels and other components
12. Minimum staff required on site, for installation purposes:
    - Engineers and/or technicians from the installation service supplier. These engineers will be in charge of the installation. Equipment crates should be opened by engineers/technicians to verify that all components have arrived as packed by the supplier; a receipt checklist/report should be prepared.
    - Local laborers. Ensure that there are local laborers available for carrying the materials and doing minor work such as installation of floors, wall, ceiling panels, doors and shelving under the supervision of the supplier's engineer and/or technician.
    - Local electrician. It is recommended that a local electrician is available on site to assist with the installation and connection of equipment to the local power supply network.
    - Local staff. It is recommended that all technical personnel responsible for the future daily operation, maintenance and service of the room(s) are present at the installation and participate in the installation work to help them gain a thorough understanding of the equipment.

4.2 Prefabricated Cold Rooms

A prefabricated cold room is a type of cold room which consists of insulating panels, allowing to be assembled in any pattern and to any size, with quick and easy installation which can be applied to any context.

COs and PS partners should consider the following guideline pertaining to prefabricated rooms:

a) Depending on the configuration of the WIC/WIF, the door position (on the long or short wall) should be in the middle, leaving a space of 2.5 – 3 meters in front of the door wall for easy access to the room, such as handling and possible repacking of stored goods;
b) When planning the room layout, please note that the side and back of the room should be installed with a minimum distance of 100 mm from the existing building wall;
c) Condenser units should not affect the ambient temperature of room where the equipment is installed.
d) As rooms are made of prefabricated insulation panels, the levelling/base evenness requirements are maximum +/- 5 mm per 5 m.

WHO Cold Store planning information and dimensions are given under chapter '5.4 Vaccine packing area' in WHO's Guideline for establishing or improving primary and intermediate vaccine stores, which includes details of a typical Cold Room shelving plan, both in top view and cross-sectional view.

4.3 Electrical Supply and Power Consumption

Power supply for the WIC/WIF is supplied by the national grid or by a generator. The power supply can either be 220-240V single phase or 380-400V 3-phase, 50/60 Hz. A proper switch box/distribution board with fuses and a main switch to isolate the power supply must be installed.
All electrical installations for cold rooms need to be validated by a testing, inspection and certification services (TIC) provider.

5 In-Country Transport

Cold / freezer rooms often need to be transported within the country. In some larger countries, WIC/WIFs are deployed at sub-national level, e.g. in regional and district or zonal stores. In most of the cases the MoH is responsible for in-country transportation and storage of the equipment before installation; it is therefore important to include related costs while budgeting for the project and, in any case, before the ordering stage. The necessary local resources for transportation, manpower and time should be included in the planning process.

6 Installation

6.1 Timely Installation

As WIC/WIF require installation, it is important to take into consideration the time and cost required for installing and making equipment fully operational. Allow for minimum 2 months of tender issuance and contract award; this timeline includes clear outlined Terms of Reference define in collaboration with the requesting country. Upon declaration of site readiness by the MoH the technicians can be deployed to initiate the installation. This time varies from case to case depending on visa and medical requirements, flight availability, etc. to assist the supplier with planning, the customer should provide all relevant facts to the supplier and provide support to help minimize potential delays.

6.2 In-Country Installation

6.2.1 Installation without UNICEF SD Support

In cases where in-country capacity is available it is recommended, for the small WIC/F between 10 to 40 cbm, to procure the installation of the WIC/WIF either internally from the national Cold Chain services or from locally contracted firms, the country may decide to take responsibility for the installation of the WIC/WIF. In this case, it is important to ensure that the in-house or contracted technicians are properly trained and have the professional experience and tools to undertake this type of work.

Outsourcing the installation of WICs and WIFs provides an opportunity for training in-house technicians. In order to build local capacity in installation, use and preventive maintenance of WIC/WIF, it is recommended to include a training session for local technicians while the contracted installer is present on site. Further information on this type of training can be obtained from the UNICEF SD Cold Chain Unit.

For countries intending to conduct the installation of received cold and/or freezer rooms themselves, the Site Preparation section, earlier in this document, will provide useful additional reference. It should be noted that the guide does not replace the necessity of qualified and knowledgeable personnel to conduct

the installation. At the end of an installation project the Installation Completion Checklist (Annex 2) serves as conclusive documentation and proof for completion.

6.2.2 Installation with UNICEF SD Support

Timely preparation of installation projects can save considerable time and resources. If a country has insufficient capacity to conduct the installation of small WIC/WIF equipment, procurement of installation services through SD is an option. Supply Division can also assist handling post-installation complications and complaints.

Installation of large WIC/WIF is normally undertaken by the same manufacturer of the cold rooms and contracted out at the time of equipment procurement. Because of the project complexity, high value and interlinked activities required by different stakeholders, it is essential to have dedicated internal resources to plan and execute the project. Supply division provides strong support throughout the different phases; however, the project management responsibility remains with the local Country Office.

Where in-country installation capacity is unavailable or limited, the installation of WIC/WIF by the local representative from the supplier can be an opportunity for in-country capacity building on the installation, use and preventive maintenance of WICs and WIFs. SD can assist in co-coordinating and contracting out training services.

To request SD assistance with installation, the following information needs to be communicated, in a timely manner:

a) Time of delivery of the cold rooms and PO reference?
b) Timeframe for the rooms to be in place (timeline for installation)?
c) Terms of Reference (TOR) for the project; including all relevant information regarding the expected scope of the work and whether additional work is required such as training, repair of existing rooms, etc. If the project goes beyond installation of WIC/WIF, SD can explore favourable options with the service provider to optimise the project outcomes, if communicated early.
d) What is the status of site readiness, including electrical installations, foundation platform, etc.?
e) Is there outstanding repair work or maintenance that could be connected to the project?
f) What WIC/WIF types and sizes are to be installed, and what is the refrigeration unit type (plug-in or split type)?
g) Are local staff with suitable qualifications level available for training if required? If so, what would be the estimated number of training participants?
h) Which type of training is required?
i) What is the exact address of the installation site(s)?
j) Is there a need to distribute the equipment to one or more destinations other than the place of delivery defined in the PO? Inform SD whether the rooms are already available on-site or what the estimated timeline is for in-country distribution to the installation site(s).
k) If different locations are involved, information about distances and travel times between the sites, the number of rooms per site, etc. should be communicated to SD. Are all installation sites ready for installation?
l) Who in the CO can be contacted for queries? Please provide contact details. The contact(s) should be available for clarification on procurement related aspects of the projects and for technical enquiries (e.g. site preparation, energy sources, logistics, etc.).

If technical local expertise for the installation of small WICs/WIFs is limited or unavailable, it is recommended to reach out to SD as early as possible. This will help minimizing the risk of potential bottlenecks, in particular relating to the availability of external technicians, practical preparation of travel and organizing additional training if required.

6.3 Finalising Installation

UNICEF requests that countries complete an Installation Completion Checklist (Annex 2). This document is to be duly signed by a CO/PS partner representative. Customer concerns, claims or any other issues related to the delivery of the service must be raised before signing the completion report. A signed report serves as confirmation that service delivery was satisfactory and triggers the release of financial settlement of related invoices.

7 Commissioning

Equipment commissioning is a formalised process through which equipment is tested, demonstrated and officially accepted by the owner. Equipment commissioning needs to be conducted to ensure that equipment is functioning properly before it is used. For WIC/WIF the commissioning process entails two options:

a. Installation done by countries themselves. In this case countries complete the Installation Completion Checklist (Annex 2), which includes a section that allows for comments on the installation and commissioning process.
b. Installation by supplier or contracted agent. In this case the supplier is responsible for the correct installation, training and commissioning of the equipment. The supplier fills in the form and has it co-signed by the beneficiary, e.g. the Ministry of Health.

Commissioning of WIC/WIF should span a period of at least 24-48 hours, to allow for sufficient 'cool-down' time of the rooms, so that proper functioning can be ensured.

8 User Training

In order for WICs and WIFs to deliver their intended services, staff using the equipment need to be trained in using the equipment correctly and confidently. The training will include routine and preventive maintenance actions, such as temperature monitoring, cleaning of the rooms and fault reporting. The User Manual supplied by the manufacturer is an important source of information. In addition, the WHO publication 'How to look after a cold room or freezer room, self-assessment tool (WHO)' provides an invaluable resource for user training.

9 Maintenance

Maintenance serves the purpose of keeping WICs and WIFs in good working order throughout their lifetime. A distinction is made between corrective and preventive maintenance. Countries need to develop in-house capacity for the maintenance of the entire stock of Cold Chain equipment. A suitably qualified technician needs to be available on location, to carry out first-line maintenance on the WICs and WIFs. This person will be qualified to carry out basic maintenance actions and be able to determine when outside

professional expertise needs to be called in. The technician will be suitably trained and have experience with the maintenance and repair of complex cooling installations.

The proportion of equipment serviced externally (outsourcing, contracting) will depend on in-house technical capacity and the availability of financial resources.

A comprehensive national inventory database of Cold Chain equipment facilitates the proper management and maintenance of equipment. Countries are advised to develop and maintain such a system.

10 Complaints Handling

For Complaints Handling procedures, please refer to the General Procurement Guidelines for Cold Chain Equipment.

11 Warranty

The warranty period for WIC/WIFs is usually two years. For general rules on warranty and when it applies, refer to the General Procurement Guidelines for Cold Chain Equipment.

12 Decommissioning

Decommissioning refers to the process of writing-off and physically disposing of equipment that is no longer cost-effective. Countries are advised to adhere to national public sector procedures for the correct disposal of health sector physical assets.

Annex 1: Additional Resources

Links to additional resources specifically on WIC/WIF.

Description	Source
Category Documentation for E001 Cold rooms, freezer rooms and related equipment by WHO PQS, 2020	WHO PQS Website
Design and procurement of storage facilities by WHO, 2015	Pdf document
EVM Assistant User Guide, 2010	Pdf document
Guideline for establishing or improving primary and intermediate vaccine stores by WHO, 2002	Pdf document
User's Handbook for Vaccine Cold Rooms and Freezer Rooms, WHO, 2002	Pdf document

Note: Users of this manual are invited to suggest additional resource materials, to add to this list. Please email your suggestions to UNICEF SD Cold Chain Unit.

Annex 2 INSTALLATION COMPLETION CHECKLIST FOR WALK-IN COLD AND FREEZER ROOMS

INSTALLATION COMPLETION CHECKLIST FOR WALK-IN COLD AND FREEZER ROOMS

Note: Complete a copy of this schedule for each Cold room or Freezer room on the site.

Pre-completion checklist Date:		
Country:	City/town:	Site name:
Room description:		
All checks must be satisfactory before final handover acceptance.		
TEST 1 - Inspection		
General All components are undamaged. Yes No		
Descriptive Comments on status/condition of parts on arrival before installation:		
Room enclosures: 1. All room enclosures have been installed and are of the correct size (m^3) . Yes/ No 2. Wall, floor and ceiling finishes are as specified in the PQS/ ITB. Yes/ No 3. All enclosure panel joints are tightly butted together. Yes /No 4. There are no gaps around panel cut-outs where refrigeration units and services penetrate the enclosure(s). Yes /No 5. There are no gaps around room door seals. Catches and locks operate freely Yes/ No 6. Door seal heater elements (where specified) are fitted. N/a Yes /No 7. Freezer room pressure relief vents are fitted and operate correctly. Yes/ No 8. Internal tungsten lighting has been fitted, operates correctly and produces the specified minimum lighting level throughout the room. Yes /No 9. Shelving units are of the specified size, material and have been set up with adjustable shelves correctly spaced. Yes / No 10. Enclosures are marked with the correct temperature zone symbol sticker. Yes /No 11. Heater mats (where specified) have been fitted under floor panels and operate correctly N/a Yes/ No		
Give a short descriptive Comment on above questionnaire:		
Refrigeration and temperature monitoring equipment: 12. Automatic/Manual duty-sharing circuits are installed and operate correctly. Yes /No		

13. Refrigeration units are marked with the correct refrigerant identification. Yes/ No

14. Evaporator cages or deflectors (where required) have been installed. N/a /Yes /No

15. Temperature recording units and sensors are correctly located. Yes/ No

16. Acoustic and/or visual alarm units are correctly positioned. Yes/ No

17. All electrical cables are securely clipped in place and electrical cover plates and accessories are securely fixed. Yes/ No

18. All components that require routine servicing or replacement are easily accessible. Yes/ No

19. All components are correctly protected against the weather or other environmental conditions. Yes /No

Comments:
20. Test recommendation: Pass Fail

TEST 2: Cool down

21. Number of hours for the WIC/WIF to reach +4^{o}C/-15^{o}C

22. Test 2 recommendation: Pass/ Fail

23. 3 – Training course(s)
24. Training on Maintenance for technicians recommended: Yes/ No
Give a brief description for the reason to arrive on the above recommendation

25. 4 – Overall conclusions and recommendations on installation and commissioning

Recommendation: Pass /Fail
If **FAIL,** list outstanding work still required:

A/

B/

C/

D/

If PASS, the installation can be handed over to the user.

Installation technician's name and signature: ……..
Date: ……

Customer`s name and signature: ……..
Date: ……

Annex 3: Record of Revisions

Date	Description	By
April 1, 2012	First draft of this manual, by UNICEF SD\HTC\Cold Chain Unit	GK, DH, AS
April 15, 2014	Draft updated with comments and suggestion made by members of global CCSP Development Group	BR
August 9, 2014	Draft updated	BR
October 28, 2014	Minor correction to volume of Cold/Freezer Room, 40 m3 (25/15)	DH
September 20, 2020	Outdated & broken internet source links were removed/replaced. Cold Chain Weight & Volume Calculator has been removed. Chapter 3.5 (Optional Accessories) has been removed. Chapter 4.1 (Site Readiness for Installation) has been revised with additional site readiness considerations. Annex 1 (Accessories for Walk-In Cold Rooms and Freezer Rooms) has been deleted. New Annex (Annex 2. Completion Checklist) has been added. Annexes were re-numbered as: Annex 1: Additional Resources Annex 2: Installation Completion Checklist for Walk-In Cold and Freezer Rooms. Annex 3: Record of Revisions Three outdated additional resources have been removed from Annex 1.	SA, TC
September 22, 2020	Commercial & contractual updates in all chapters.	CM
September 23, 2020	Texts are revised to reflect updates on RTMDs and Voltage Stabilizers.	JS, MK
September 28, 2020	General overview of the guideline, re-phrasing of some descriptive texts to improve clarity.	TS, JK