TITAN CONTAINERS

Instruction Handbook

RESPONSIBLE MANUFACTURER
Yangzhou Tonglee Reefer

REPRESENTATIVE
TITAN Containers A/S

MACHINE
ArcticStore with Thermoking Magnum Plus 4000

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Attention!

This instruction handbook contains instructions for installing, commissioning, operating and maintaining the machine.

The instructions are made available by the manufacturer to provide information and to show the tasks that shall be performed.

Before commissioning the machine, all information in this instruction handbook is to be carefully read and understood. Make sure that the instructions below are read and understood, kept up to date according to the machine and that the instructions are always followed when working with or servicing the machine.

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1. Introduction

1.1 Objective

The objective fulfilled by this instruction handbook is to ensure the correct use of the machine, including installation, operation, handling, cleaning, maintenance, dismantling and scrapping.

The instruction handbook is an integral part of the machine, providing the user with the required information needed for correct and safe use of the machine.

If changes are made to the machine, the instruction handbook and the risk assessment shall be reviewed and corrected, if necessary.

1.2 Reading instructions

The instruction handbook has been prepared in accordance with the Machinery Directive 2006/42/EC and EN ISO 20607 – Safety of machinery – Instruction handbook – General drafting principles and is the manufacturer's original instruction handbook for the machine.

The instruction handbook provides the user with the information necessary for the safe and effective use of the machine during the life cycle of the machine. General safety instructions and conditions are described in a single chapter.

The instructions are for all users of the machine, where content is subdivided according to the users' function and use of the machine. Safetyrelated information and instructions appear at specific machine related tasks or as general information for all users.

The following procedure is recommended when going through the instruction handbook:

- Identify yourself with one or more user groups before using the machine.
- Read and understand the contents of the instruction handbook, including information and instructions addressed to the identified user group.

In case of uncertainty or lack of understanding of the above mentioned, contact the nearest manager.

Original instruction handbook:
This document is the original instruction handbook for the ArcticStore with TK MP4000 (subsequently referred to as the machine)

Knowledge:
It is the responsibility of the employer (the machine owner) to ensure that all user groups who are to install, operate, service, maintain, repair or disassemble the machine, have read the instruction handbook or at least the parts relevant to their tasks.

In addition, everyone who must operate, service, maintain or repair the machine has a duty to search for all relevant information in the instruction handbook.

Availability:
The instruction handbook must be kept in a place known to the staff, where it is easily accessible to relevant users.

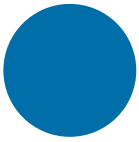
1.2.1 Symbols used

Symbols are used in this instruction handbook to highlight information, references and warnings of hazards during machine use or when performing specific tasks.

The following symbols are defined:

SYMBOL	MEANING OF THE SYMBOL
	**Attention** Attention required. Indicates required action, for establishment of safe working conditions or use.
	**Reference to documentation** Refer to relevant information in this or other instruction handbook or safety data sheet.
	**General warning** Attention required, waring of potential hazards. (Description of hazard sources, safety measures, etc. appears where applicable).
	**Information aimed at operators** Indicates chapters, information, etc. targeted, but not limited, to operators.
	**Information aimed at maintenance personnel** Indicates chapters, information, etc. targeted, but not limited, to maintenance personnel.
	**Information aimed at cleaning personnel** Indicates chapters, information, etc. targeted, but not limited, to cleaning personnel.

Safety markings and pictograms are used to warn and/or inform different user groups. Their meaning is interpreted as follows:

Geometric shape	Meaning	Safety colour	Contrast colour	Graphical symbol	Use case example
	Prohibition signs	Red	White	Black	 Do not touch
	Mandatory action signs	Blue	White	White	 Wear ear protection
	Warning signs	Yellow	Black	Black	 Warning: Electricity
	Safe condition signs	Green	White	White	 Emergency exit
	Fire equipment sign	Red	White	White	 Fire extinguisher

1.2.2 Associated user documentation

The machine is assembled from other CE-marked machines and/or machine components. For technical details and information, see the instruction handbook for the respective underlying machine or component.

The following existing user documentation is available:

Sub-machine	Manufacturer	Instructions title	Comments	File	Location
ArcticStore	Yangzhou Tonglee Reefer	TITAN Containers – Thermo King Magnum Plus	EC-Declaration	Instruction Handbook – ArcticStore Thermo King MP 4000	*View document*

1.2.3 Specific Operator's Manual for Thermo King, and other documentation

Sub-machine	Manufacturer	Instructions title	Comments	File	Location
Thermo-king	Thermoking	Thermo King	Operator's Manual	TK OPERATOR Manual 61959_4-OP_EN – 0522.PDF	*View document*
ArcticStore	Yangzhou Tonglee Reefer Container Co. Ltd.	Container	Documen-tation/data sheet	AM_EN_ArcticStore_User_manual_v1-0_07-07-2020[3].PDF	*View document*
TK Magnum error code/ alarm man-uals	Thermoking	Thermoking Code/alarm Manual	TK Magnum error code/ alarm manuals	MP4000 Alarm Descriptions.PDF MP4000 Warning Descrip-tions.PDF	*View document*
TK Parts manual	Thermoking	Thermoking Parts Manual	Parts manual	TK PArts manual 54356-4-PM_Rev. 6-13-23_LR.PDF	*View document*
TK Mainte-nance	Thermoking	Thermoking maintenance manual	Maintenance Manual	TK Maintenance manual_EN_MAGNUM_PLUS_with_MP4000.pdf	*View document*
TK Driver guide	Thermoking	Thermoking Driver guide	Driver guide	TK MP4000 (Drivers Guide)_(03-2019)-EN_V1.0_LR.PDF	*View document*
Certifications	TITAN Containers	TITAN Containers Certificates	Certificates	DK01559-1 TITAN Containers ISO 9001 DANAK UK 10-06-2022.PDF DK01560-1 TITAN Containers ISO 14001 DANAK UK 10-06-2022.PDF	*View document*
Declaration of conform-ity	Thermoking	Thermoking certificate	Declaration of machine conformity	CE_Declaration of Conform-ity_TK_ReeferUnits.PDF	*View document*
ArcticStore		Safety data sheets	Gas SDS R452A/R404A	Safety data sheet - R404A.PDF	*View document*
ArcticStore	Yangzhou Tonglee Reefer Container Co. Ltd.	Maintenance list	Maintenance tasks	Tool - To do list for yearly maintenance of ArcticStore – ENG.PDF	*View document*

Sub-machine	Manufacturer	Instructions title	Comments	File	Location
Container	Yangzhou Tonglee Reefer Container Co. Ltd.	ISO Corner certificate	ISO Corner certificate	ISO Corners certificate.PDF	*View document*
ArcticStore 10′	Yangzhou Tonglee Reefer Container Co. Ltd.	Specs & drawing	Specs & drawing	10ft ArcticStore Tropical Specification - D10-NDGD-02C-C10 – 20220805.PDF 10ft ArcticStore Tropical Technical Drawing – 20220912.PDF	*View document*
ArcticStore 20′	Yangzhou Tonglee Reefer Container Co. Ltd.	Specs & drawing	Specs & drawing	20ft ArcticStore Tropical Specification - D20-NDGD-02C-H20 – 20220805.PDF 20ft ArcticStore Tropical Technical Drawing – 20220906.PDF	*View document*
ArcticStore 40′	Yangzhou Tonglee Reefer Container Co. Ltd.	Specs & drawing	Specs & drawing	40ft ArcticStore Tropical specification - D40-NPGD-06A-B40H – 20210410.PDF 40ft ArcticStore Tropical specification - D40-NPGD-06A-B40H.PDF	*View document*
ArcticStore	Yangzhou Tonglee Reefer Container Co. Ltd.	Electrical drawing	Electrical Drawing	Electrical Drawing - 10' ArcticStore Tropical.PDF Electrical Drawing - 20′ ArcticStore Tropical.PDF Electrical Drawing - 40′H ArcticStore Tropical.PDF	*View document*
ArcticStore	Yangzhou Tonglee Reefer Container Co. Ltd.	Marking & assembly	Marking & Assembly	Marking & Decal Drawing - 10' ArcticStore Tropical.PDF Marking & Decal Drawing - 20′ ArcticStore Tropical.PDF Marking & Decal Drawing - 40′H ArcticStore Tropical.PDF	*View document*

1.2.3.1 Overview

Documentation and manuals can be downloaded from website or upon customer request: *LINK*

See also section: *Documents and drawings*

Extensive information on specific underlying machines or machine components are not covered in this original e following instruction handbook. Instead, refer to the respective section in the user documentation for the individual machines or components.
For example: When consulting the section "Maintenance", see the corresponding section in the associated user documentation for the individual machine or component.

See also section: *Components supplier instruction handbooks*

1.3 Manufacturer

The machine is manufactured by:

Company name:	Yangzhou Tonglee Reefer
Company address:	2333# Pang Jin Road, Economic Development Zone, Wujiang. Suzhou. Jiangsu, China 215200
Tel. No.:	Office: +86 512 6231 2275
Email:	N/A
Website:	CIMC

The machine is imported into the EU by representative:

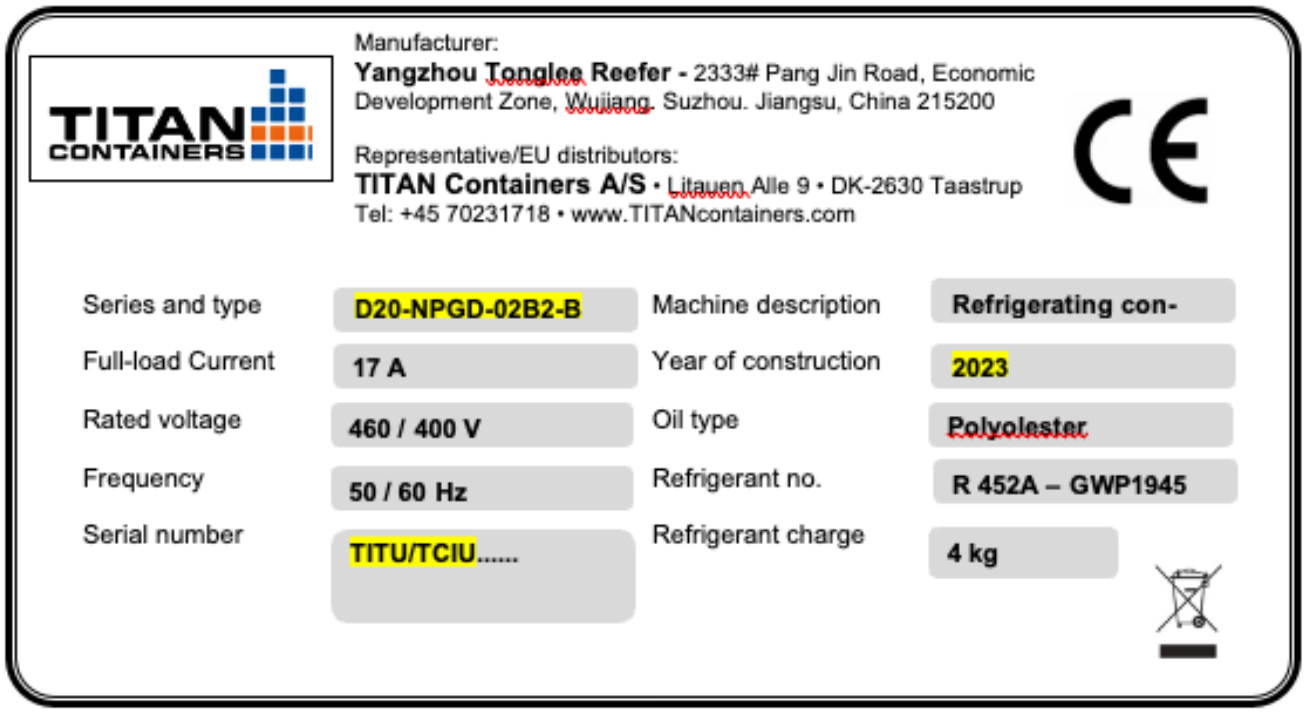
Company name:	TITAN Containers A/S
Company address:	Litauen Alle 9, 2630 Taastrup, Denmark
Tel. No.:	+45 70 23 17 18
Email:	info@TITANcontainers.com
Website:	TITANcontainers.com

1.4 Designation of the machinery

The full designation of the machinery is:
ArcticStore with Thermo King Magnum Plus 4000

1.5 Nameplate

Sample



Location on Machine:
On door, below CSC plate

1.5.1 Nameplate text

Series and type:	As defined on the nameplate
Full-load Current:	17 A
Rated Voltage:	460 / 400 V
Frequency:	50 / 60 Hz
Serial number/type:	As defined on the nameplate
Machine description:	As defined on the name plate
Year of construction:	As defined on the name plate
Oil type:	Polyolester
Refrigerant no.:	As defined on the nameplate
Refrigerant charge:	As defined on the name plate

1.6 Abbreviations

Abbreviation	Full name
MD	Machinery Directive (2006/42/EC)
HMI	Human-Machine-Interface
LOTO	LockOut - TagOut
MSDS	Material Data Safety Sheets
OSHA/GHS	Global Harmonized System of classification and labelling of chemicals - Guidelines.
PTI	Pre-Trip Inspection

1.7 User groups and qualifications

Users of the machine must identify themselves with a user group. These are divided according to their user interface and tasks related to the use of the machine throughout the life cycle of the machine. The information and instructions in the instruction handbook are divided according to user groups, and are marked using symbols, see below.

1.7.1 Operator

Tasks, instructions, etc. addressed to operators are marked with:

Operators are people whom:

- Physically uses the machine and/or its control system during normal operation.
  - Such as operating the machine and its controls.
- Uses the machine under management and with the consent of the owner of the machine.
- Are qualified in professional education or in training that equates them with this.
- Can make general adjustments, rearrangement, etc.

Operator requirements and qualifications

Operators must be trained/instructed in the use of the machine based on the following requirements:

- Must have read and understood the instruction handbook as well as any attached instructions, safety instructions, etc.
- Gain knowledge of the machine's functions and safety conditions. This may be achieved by employee-by-employee training, or by reading the instruction handbook as well as any attached instructions, safety instructions, etc.
- Trained and/or instructed in the use, handling, etc. of the machine.
- Gain knowledge of the location of safe access routes and emergency exits.
- Gain knowledge of the location of emergency stop, or similar and other safety equipment's, fire-fighting equipment and first-aid equipment.
- Possess full mobility and general physical and mentally well-being, just as they must have normal sight and hearing, possibly when using spectacles/hearing aid.

Before starting up or servicing the machine, operators must be informed of all installed safety measures.

See section: *Safety functions, overview.*

1.7.2 Maintenance personnel

Tasks, instructions, etc. addressed to maintenance personnel are marked with:

Maintenance personnel are people whom:

- Are tasked with remedying and correcting faults and defects on the machine.
- Are qualified to do maintenance on electrical parts, refrigerant parts and machine overall.

- Are tasked to ensure that the machine is in a proper and safe condition, including that all safety precautions delivered with the machine always are in place and in working order.
- Maintains and services the machine according to the manufacturers' instructions and the instructions in this handbook.
- Are qualified by professional education, e.g. mechanic, electrician, etc. or by training that equates them with it.
- **Paragraph 6.1 - Training requirements (Ref. with BEK No 498 of 22/05/2024)**
  Work on refrigeration systems and heat pump systems with installation, commissioning, repair, maintenance, inspection and decommissioning work, including emptying, shall only be carried out by persons who have undergone training and hold a certificate.
  The regulations on occupational safety and health training indicate when a certificate is required and the qualifications to be held before a certificate can be issued.
  In addition, the person must have qualifications and have received instruction which is necessary in relation to the present task.
  Service and maintenance - specially for the refrigerator part.
- Only a qualified undertaking shall have described and apply the procedures to ensure that the work is carried out by persons who have undergone training and hold a certificate in accordance with this Section 6.1.

Maintenance personnel requirements and qualifications

Maintenance personnel must be trained/instructed in the use of the machine based on the following requirements:

- Must have read and understood the instruction handbook as well as any attached instructions, safety instructions, etc.
- Gain knowledge of the machine's functions and safety conditions. This may be achieved by employee-by-employee training, or by reading the instruction handbook as well as any attached instructions, safety instructions, etc.
- Gain knowledge of the location of safe access routes and emergency exits.
- Gain knowledge of the location of emergency stops, or similar and other safety equipment's, fire-fighting equipment and first-aid equipment.
- Possess full mobility and general physical and mentally well-being, just as they must have normal sight and hearing, possibly when using spectacles/hearing aid.
- Recommended Maintenance check list in appendix.
- Where required, F-gas certification of the technicians.

Before commencing maintenance work on the machine, maintenance personnel must be instructed in safety conditions around the machine. An experienced colleague must train new personnel.

Warning!
Improper maintenance can be dangerous and in the worst-case lead to death!

1.7.3 Cleaning personnel

Tasks, instructions, etc. addressed to cleaning personnel are marked with:

Cleaning personnel are people whom:

- Are tasked with cleaning the machine and its surroundings.
- Are qualified in professional education or in training that equates them with this.
- During cleaning, gains access to the machine's internal parts by removing or opening safety measures such as guards, interlocks, etc.
- Water with PH level around 7 shall be used.
- All chemical need to be rinsed after to avoid any damages to unit.
- If machine is required to be turned OFF, then use LOTO to prevent the machine to turn ON again.
- Clearly put signage that maintenance is under process.

Cleaning personnel requirements and qualifications

Cleaning personnel must be trained/instructed in the use of the machine based on the following requirements:

- Must have read and understood the instruction handbook as well as any attached instructions, safety instructions, etc.
- Gain knowledge of the machine's functions and safety conditions. This may be achieved by employee-by-employee training, or by reading the instruction handbook as well as any attached instructions, safety instructions, etc.
- Educated and/or instructed in cleaning the machine.
- Gain knowledge of the location of safe access routes and emergency exits.
- Gain knowledge of the location of emergency stops, or similar and other safety equipment's, fire-fighting equipment and first-aid equipment.
- Must have read and understood safety data sheets for all chemicals used during cleaning.
- Follow all instructions for safe shutdown and disconnection of the power supply to the machine, including measures to maintain the disconnection.
- Possess full mobility and general physical and mentally well-being, just as they must have normal sight and hearing, possibly when using spectacles/hearing aid.

Before commencing maintenance work on the machine, maintenance personnel must be instructed in safety conditions around the machine. An experienced colleague must train new personnel.

Warning!
Improper maintenance can be dangerous and in the worst-case lead to death!

2 Safety

The machine may only be used as intended. If the machine is used for another purpose or changes are made to the design, the supplier does not guarantee the safety of the machine.

2.1 Hazardous situations during intended use

2.1.1 Water icing

The water from internal clean can also cause ice on the ground if not lead away which, from machine if turn ON, can also cause floor to be slippery to due water being ice.

2.1.2 Transport/movements of loads – TITAN Containers

Danger of drop or collision with lifted load

During operation, loads are transported within the work area, which can cause irreversible damage if dropped, as well as crushing hazard between the load and structural elements.

During the transportation of loads, crushing hazards can occur between heavy TITAN Containers when lifted and suspended in the air and above ground, creating a hazard should the load fall or strike equipment during the move to its final location. Never walk under a suspended load!

The following precautions must be followed during transport-, -unload and location of machine:

- LOTO system.
- Exercise caution when transporting lifted loads.
- Establish a full overview of the area and plan when moving a load/lifted equipment, that is to be located by crane.
- Keep unwanted personnel away when the machine is placed in its final location area.
- Consider that the surroundings may change during the lifting process, and where machine is to be located.
- User proper materials to lift the machine and ensure materials have been inspected.

The following personal protective equipment shall be used during lifting operations or when working around suspended loads:

Safety footwear
Wear safety shoes where there is a risk of objects falling and where feet are generally exposed.

Head protection
Use head protection where there is a risk of objects falling and the head is generally exposed.

Protective gloves
Wear protective gloves during maintenance and cleaning, or frost damage for the operator/users and when hands are exposed to hazards.

Reflex jacket (Class 3)
Fulfils EN ISO 20471, warning class 3.
Always use a reflex jacket when unloading and loading containers or even when moving heavy loads. Visibility reduces the risk of collision.

2.1.3 Hot surfaces

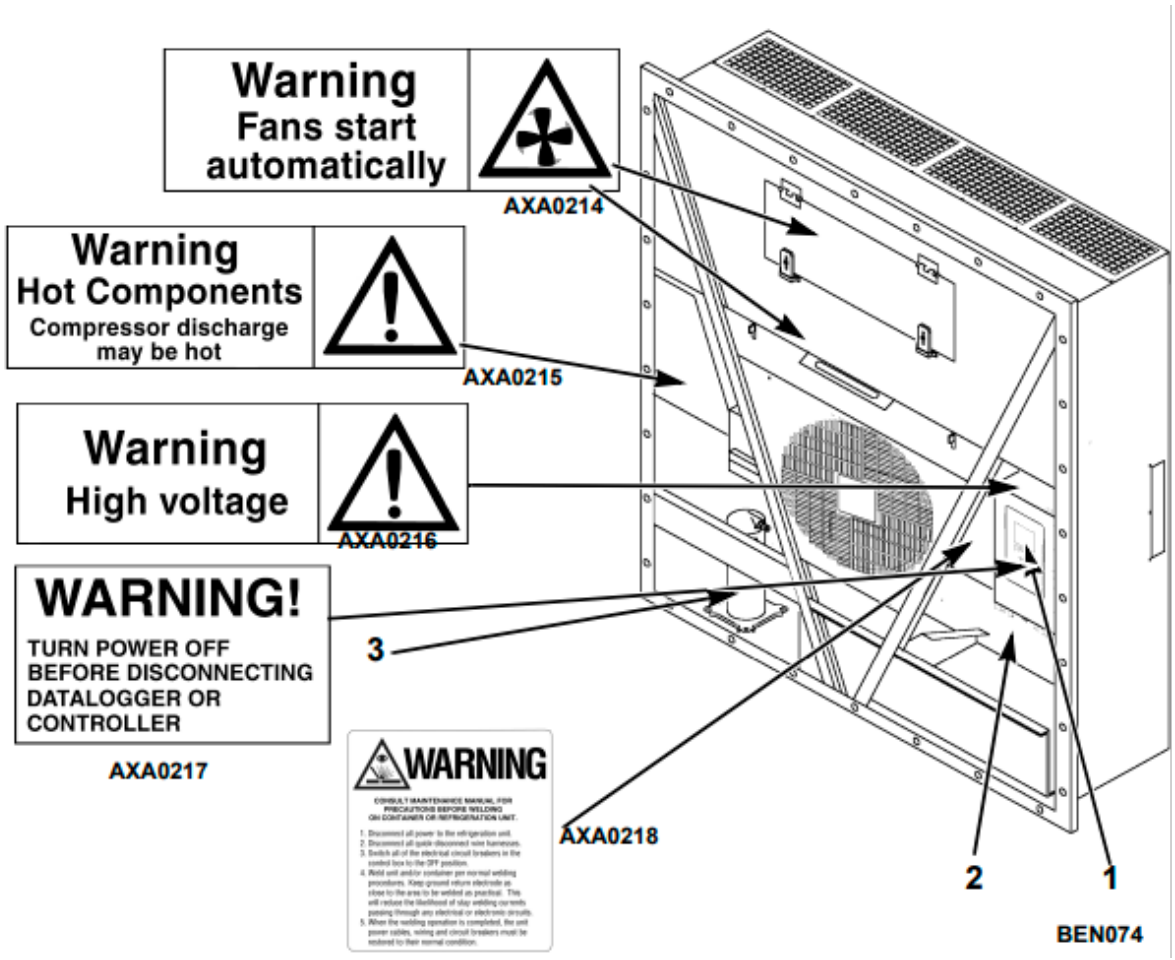
Danger of hot surfaces!
During operation, the surfaces on the rear of the machine can become hot and can cause burns or discomfort when directly touched.

Exercise care when working with and maintaining hot items or machine surfaces.
Exercise care when performing maintenance on the pipe system. Pipes mounted at a height above 2.5 m may be exposed and have hot surfaces with a temperature above 60 °C.

If hot surfaces are to be accessed, or work near hot surfaces is required, the following personal protective equipment must be used:

Heat-resistant protective gloves
Wear heat-resistant protective gloves where it is necessary to handle hot items or surfaces.

Hot surface documents are also available through link and in appendix.



2.1.4 Hazardous materials and substances

Danger of contact with harmful corrosives!
During maintenance or in case of failure, users may meet corrosive substances which may cause dizziness and headache by inhalation, as well as chemical burns and permanent eye damage.

Read the safety data sheets for hazardous substances
When working with harmful substances, including cleaning and disinfection, maintenance, etc. the following must be observed:

- Read and understand all safety data sheets for used substances.
- Use all protective equipment described in the safety data sheet.
- Familiarise yourself with relevant first aid measures.

Hazardous substances are used in the cleaning and disinfection process of the internal parts of the machine. During the process, there is no direct contact between people and the substances, however, residues of the hazardous substances can occur in the pipe system if the process is interrupted.

The machine may contain the following substances:

- Refrigerants: R452A, R404A

The following personal protective equipment must be used when handling FDA certified fluids/cleaning agents on internal surfaces inside the container:

Eye protection
Wear safety goggles when there is a risk of contact with CIP fluids.

Protective gloves
Wear acidresistant protective gloves when there is a risk of contact with CIP fluids.

Respiratory protection
Wear respiratory protection when there is a risk of contact with fluids or inhalation of gases.

2.1.5 Hazardous materials and substances:

Danger of inhalation of toxic gases!
Leak of the cooling system.
Exposure to toxic gases can cause symptoms such as headache, nausea, cough, dizziness and vomiting, as well as respiratory problems.
At higher concentrations: coughing, difficulty breathing and pain in the respiratory tract, followed by convulsions and unconsciousness can occur. In several cases, this can lead to death.

Waste water from drains, when container is located inside:
Local legislation must be followed in terms of drainage.

The machine should always be kept clean, to maintain a satisfactory level of hygiene internally.

For that purpose, there are 4 internal drain points, one in each corner (2 in front and 2 in the rear of the container) but also pipe from machinery for defrost water to goes out. Drains should be connected to a sewer ideally or in

an area where wastewater/condensation water are properly managed.
Defrost water pipe should be connected to a waste management system whether unit is located outdoor or indoor.

Free Passage:
Ensure when loading the container with pallets that the drain points are not covered or blocked.

The following personal protective equipment must be used when working:

Gas measurement (if necessary)
Measure the air quality in the work area throughout the entirety of the work to be done.

Respiratory/breathing protection (Only recommended)
If adequate ventilation cannot be maintained, appropriate breathing apparatus must be used when working in the working area.
Adequate ventilation is assessed by measuring air quality in the working area.
When gas measurements indicate the need for breathing protection, they SHALL be made available by the employer.
In general, pictograms should also be set up where the risks arise and are present.

Protective gloves
Wear protective gloves when working in the work area, or when working with sewage in general.

Head protection
Use head protection when working in the work area.

A cooling system shall be introduced to ensure that the condenser has sufficient cooling and that no fire can break out.

It is important that no heat is added, or another ignition source has been used close to the sealed cooling system/container.
Explosion, which may result in death or serious damage, may occur if this heat is applied to the sealed cooling system or area of container.

Pictograms shall as well be placed close to the possible danger and warns of the possible dangers it may arise.

In case of a failure-current, or overheating, the safety system must switch off,

else a fire hazard may occur, in the refrigerator system. **See section:** *Location of safety symbols and/or pictograms on the machine.*

Open flame prohibited
Open flames or smoking around the TITAN Containers cooling system is prohibited as any leak introduces a risk of toxic and corrosive gases accumulating in the system.

2.2 Foreseeable misuse

2.2.1 Safety related guards

Warning!
Serious damage can occur in the case of missing or defective guards.
Direct contact with the moving parts of the machine can result in serious injury or death when inside the guards of the machine.

The machine is equipped with safety related guards to prevent access to dangerous areas of the machine. Bypassing, dismantling or neglecting guards can lead to serious injury or death.

The guards of the machine are only to be bypassed by personnel who have been instructed in the use of the machinery and are aware of the hazards associated with the use of the machine.

Before using and maintaining the machine and the removal of any guards the area around the machine must be sufficiently fenced off with clearly visible signs displayed to ensure no unauthorized access to the machine. Signs and fencing must not be removed until the machine has all guards back in place.

Before starting the machine, the operator must inspect the machine for visible defects that affect safety during operation.

2.2.2 General safety information for intended use

READ the instructions

- Read the user manual and symbols on TITAN Containers carefully, before use.

See and find actual information in this section: *Associated user documentation*

GENERAL

- PRECAUTION against falls and frostbite, always wear appropriate thermal clothing and footwear while entering or working inside the refrigerated container.
- (Recommendation only) Wear goggles or safety glasses when working at the rear of the machine as a safety precaution based on storage of refrigeration gases and other fluids incorporated into the refrigeration equipment.
- [Turn on] the light while working inside the machine.
- Kindly note while the plug is in position, the heating cable is always working, turned [ON].

- The ramp is always positioned on the bigger door area, right side), connected to ramp locator, be aware of potential trip hazards while stepping out or walking around the TITAN Containers.

Ramp located in right-side. (Load: Max. 500 kg.)

2.2.3 When entering the container

Every time you use the container, follow the following procedure:
Open the container door by pressing in the lock closing device and pulling the door handle towards you. See figures 5.1.16 - 5.1.17.
Now open the container door enough for the lock rods to be completely free of the cam keepers at the top and bottom.
See figures *5.1.18 - 5.1.20.*

Then press the handle all the way down until the lock closing device clicks and the lock rod can now no longer move into the cam keeper. Even if the door should now slam shut due to e.g. high winds or because you carefully close the door while you are inside the container, the container door cannot lock.
See figures 5.1.21 - 5.1.24.

Figure 5.1.16 Press in the lock closing device.

Figure 5.1.17 Pull the door handle.

Figure 5.1.18 Open the door.

Figure 5.1.19 Lock rod top.

Figure 5.1.20 Lock rod bottom.

Figure 5.1.21 The closing device clicks.

Figure 5.1.22 Lock rod in secure position top.

Figure 5.1.23 Lock rod in secure position bottom.

Figure 5.1.24 Open the doors completely.

Figure 5.1.25 The safety chain is placed at the bottom of the doors

Figure 5.1.26 The chain is secured to the hook on both sides of the container.

When the doors are fully opened, it is important that the doors are always secured by the chain on the door safety hooks on the side of the container. The purpose is to safeguard against unexpected accidents with swinging door(s), for example as the result of high winds.

2.2.3.1 Securing/lock

- **NEVER** close the door while there are people inside the container.
- If possible don't enter the storage room alone, have someone with you who remains outside.
- If you need to enter alone, always place the handle in the locked position, so that it cannot accidentally lock itself.
- When the door is opened fix the door with the securitychain, **see figure above:** *5.1.26*, so that the wind cannot blow it closed and lock it accidentally.

2.2.4 Operate in the rear-end of container/refrigerator end

- **It's recommended to wear goggles**, or safety glasses when at the rear of the machine as a safety precaution based on the storage of refrigeration gases and other fluids incorporated into the refrigeration equipment.
- **NEVER** operate the unit with the discharge valve on the compressor in the closed position or move the discharge valve to the closed position while the unit is in operation.
- **Keep** hands away and clothing and any tools clear of the fans when the refrigeration unit is running. If it is necessary to run the refrigeration unit with the safety guard removed, apply extreme caution with the use of tools or meters in the area.
- **NEVER** apply heat to a sealed refrigeration system or container. Fluorocarbon refrigerants produce toxic gases in the presence of an open flame or electrical arc. The gases can cause severe respiratory problems and even fatality.
  See section: *Hazardous materials and substances*
- **Display caution** when working in areas where sharp edges may be present such as exposed coil fins which can cause injury.
  Display caution when working with a refrigerant or refrigeration system in any closed or confined area with a limited air supply (for example, a trailer, container or in the hold of a ship). Refrigerant will displace air and can cause oxygen depletion. This can result in suffocation and possible fatality.
- **Display caution** and follow the manufacturer's suggested practices when using ladders or scaffolding.

2.2.5 Electrical Precautions

- Light, alarm and heating cables are powered by 220V, unauthorized electricians must not dismantle, wire or perform repairs to prevent safety accidents.
- Serious or fatal injury from electrocution is a risk when servicing a refrigeration system.

- **Extreme care** must be used when working with a refrigeration system that is connected to its power source. Extreme care must be taken even if the unit is not running.
- The nature of this high voltage equipment determines that at multiple points across the system potential for serious or fatal injury exists such as power cord, control box, high voltage junction box, motors and system wiring.
- **Always disconnect** the units power cord before repairing or changing any electrical components. **Note!** That if the controller is turned off, a live phase can still present a potential danger of electrocution. See this section, **how to disconnect:** *Energy isolation.*

Precautions in general

- **Turn-off** the unit [on/off] button - before connecting or disconnecting the unit power plug.
- **Be certain** the unit power plug is clean and dry before connection to a power source.
- Use tools with insulated handles and that are in good condition.
- **NEVER** hold metal tools in your hand if exposed, energized conductors are within reach.
- **Do NOT** make any rapid moves when working with high voltage circuits.
- **Do NOT** grab falling tools or other objects – there is a risk these may contact high voltage wires
- Treat all wires and connections as high voltage until amperemeters and wiring diagram shows otherwise.
- **NEVER** work alone on high voltage circuits on the refrigeration unit. Another person should always be standing by in the event of an accident to shut off the refrigeration unit and to assist should someone need help.
- Have electrically insulated gloves, cable cutters and safety glasses available in the immediate vicinity in the event of an accident.

2.2.5.1 First Aid

- If a person should receive any form of electric shock seek medical attention immediately!

The source of the shock must be isolated immediately. **Find LOTO-procedure next to this section:** *Isolation and locking*

- Do **NOT** touch the victim before the power has been ensured isolated and locked.
- Use the recommendation of first aid, follow the basic advice, or call the emergency number of your country.
- In this scenario, or if it is not possible to shut off the power, use a wooden handle or other insulated instrument/tool that will not conduct electricity to free the person from the electrical source. The wire should be cut with either an insulated instrument (e.g., a wooden handled axe or cable cutters with heavily insulated handles). A rescuer wearing electrically insulated gloves and safety glasses could also cut the wire. Do not look at the wire while it is being cut. The ensuing flash can cause burns and blindness. Check immediately for the presence of a pulse and respiration after separating the victim from the power source. If a pulse is not present, start CPR (Cardiopulmonary Resuscitation) and call for emergency medical assistance. Respiration may also be restored by using mouth-to-mouth resuscitation.

2.2.5.2 Low Voltage

Control circuits are low voltage (24 Vac and 12 Vdc) and, while this voltage potential is not considered as dangerous, caution should always be applied. Higher current over 30 amperes can still cause severe burns. Do not wear jewellery, watches or rings as these items can promote an electrical circuit and cause severe burns to the wearer.

2.3 In general – Its required to keep the area clean and in good order

Keep in the area around the machine
It is necessary to keep the area around the machine in clean and good condition, both inside and outside, the area around the ramp and behind the TITAN Containers, rear end of the cooling unit/refrigerator system. Access areas must be kept free from the accumulation of objects or material to ensure unobstructed access. The recommendation is at least 1 meter for personnel access.

Keep accessways free!

- Keep general accessways clear around the container, doors, ramp and at the rear around the control box/cabinet and the cooling unit.
- Keep the area clear, around, above and at the front of the cabinet. The control unit must not be used for storing equipment, tools, materials, papers, documentation or the like, to safeguard cabling against damage, the function of the fan, etc.
- In general, TITAN Containers recommended to have a minimum distance: 2 meters (Example from wall/another container to fan) to ensure enough space for forklift etc.

Warning!
A lack of order around the machine, at the front or back of the machine, or -inside the container, in relation to flammable materials and/or liquids - May lead to injury to people and materials, or ignition causing a fire.

Warning!
Pay attention to wearing the correct personal protective equipment, clothes, shoes etc. when entering the containers freezer area – these units are refrigerated, and the floors can become slippery.

Warning!
Pay attention to wearing correct personal protective equipment, such as safety glasses when around the rear of machine area – as a safety precaution based on storage of refrigeration gases and other fluids incorporated into the refrigeration equipment.

Warning!
In the event of an unexpected or sudden leakage of liquid or similar, the liquid must be identified and removed immediately.

2.3.1 Restricted access

Warning!
Machine surfaces may not be used as access ways, as this may lead to falls or the collapse of parts of the machine resulting in injury.
The machine shall not be used for residential purposes or accommodation of any kind.

It is not permitted to use the machine's surfaces as an access path unless designed for such.

- Do not stand or climb on the machine, etc. It is not allowed due to the risk of falling or inappropriate working positions.
- Do not use the machine's parts/surfaces as storage, workspaces or similar, or to support other machinery.

2.3.2 Lack of training

Warning!
A lack of knowledge or understanding of the machine and its safety conditions can lead to irreversible injury.
Do not use the machine until you have received the necessary training and instruction. Uncertainty about the safe and efficient use of the machine should be avoided.

2.4 Special conditions for different user groups

The machine owner may only hand over work with the machine to persons who:

- Are familiar with the basic regulations on occupational safety and accident prevention and are suitably instructed in the handling of the machine.
- Have read and understood the safety chapter and the warning instructions in the instruction handbook and have confirmed this with their signature.
- Only trained or instructed personnel may use the machine. Determine staff qualifications and responsibilities for operation, preparation, maintenance and repair. Regularly check that the personnel work with a full understanding of safety and hazard considerations in accordance with the instruction handbook.
- Only TITAN and authorised partners are permitted to open the control box or other container components and/or accessories to perform tests and/or repairs.
- Personnel under the age of 18 must not operate the machine. Note: Suppliers/manufacturers of components may make stricter requirements, for age and qualifications.

2.4.1 Restriction of access to change settings by use of a password

- The machine owner must ensure that operators only have access to relevant screens of the HMI display.

- The machine owner must ensure that only personnel who are competent and authorized by the company to make changes, can change the programming and safety settings of the machine.
- The changes must not alter or supersede the requirements described in **section:** *Original equipment manufacturer settings.*

2.5 Residual risks

The following residual risks have been identified for the machine:

Danger of electric shock!

The machine contains hazardous voltage levels. Contact with hazardous voltages can result in serious injury or death.

1. Disconnect the supply through the supply disconnecting device.
2. Lock the supply disconnecting device in the "off" position.
3. Verify the deenergized state before starting maintenance.

Electrical related work may only be carried out by a trained expert or authorised person.

Danger of electrical shock (hazardous residual voltages)!

The machine contains hazardous residual voltages. Contact with hazardous residual voltages can result in serious injury or death.

1. Disconnect the supply through the supply by disconnecting the plug from socket, cable and socket interface/isolation point.
2. Disconnect the supply through the supply by disconnecting the plug from socket
3. Lock the supply disconnecting device in the "off" position.
4. Wait the defined discharge time, stated on the component/ housing containing the hazardous residual electrical voltage.
5. Check the unit is in a deenergized state before starting maintenance.

Electrical related work may only be carried out by a trained expert or authorised person.

Danger of hot surfaces – specific applicable to Compressor area

Risk of contact with hot surfaces in the rear-end of Machinery can cause burns or discomfort when touched directly, temperature up to: 138°c.

1. Disconnect the supply power through the cable and socket interface/isolation point.
2. Lock the supply disconnecting device in its "OFF" position or by LockOut-TagOut device (LOTO).
   See procedure: *LOTO procedure*
3. Wait until the hot surfaces of the machine have cooled below 60 ° C.

Risk of frostbite on surfaces (inside)

Contact with freezing surfaces inside the storeroom can pose a risk of frostbite, if correct protective gloves, shoes or clothing is not worn

Crushing hazard

Contact with moving parts/loose machine parts, doors etc. can lead to trapping or crushing of body parts.

Risk of falling

- The entrance to the container takes place via the ramp attached to the doorway-side.
- Keep the walkways free around containers. It's recommended to have at least 1-meter free passage around the container.
- Be aware that floor can be slippery

Risk of inhalation - hazardous gases (Toxic and corrosive gases).

The machine uses refrigerant R452a, R404a

Inhalation: If R-452a/R404a leaks in a confined space, it can displace oxygen, which might lead to suffocation. Always ensure good ventilation when working with it.

Contact: Direct contact with the liquid can cause frostbite due to its extremely low boiling point.

Flammability: R-452a/R404a is classified as non-flammable under normal conditions, but it can decompose at high temperatures to produce toxic and corrosive gases.

1. Always ensure good ventilation and safe working conditions.

2. Check the air quality by measurements throughout the duration of the work.
3. Use suitable protective equipment (supplied breathing apparatus) where adequate ventilation cannot be obtained.

See also section: *Procedure for refill or replace of F-gas*

Risk of contact of refrigerant

Refrigerant in a liquid state evaporates rapidly when exposed to the atmosphere, freezing anything, it contacts:

- Wear butyl lined gloves and other clothing
- Wear eye wear when handling refrigerant to help prevent frostbite. When working with or around hazardous chemicals! ALWAYS refer to appropriate Material Data Safety Sheets (MSDS) and OSHA/GHS (Global Harmonized System of Classification and Labelling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection, and handling instructions.

See section: *Safety data sheets (chemicals, cleaning agents, etc.)*

Risk of contact with hazardous refrigerant, chemicals – FDA certified supplies or -chemicals.

During cleaning of internal parts of the machinery strong acid and lye is used. Interruption of the cleaning process can result in trapped and stored refrigerant, gases, chlorine etc. or other chemicals in parts of the machinery that can cause irritation, and/or skin burns. Inhalation may cause irritation to the respiratory tract with burning pain in the nose and throat, coughing, wheezing and shortness of breath.
Use suitable protective equipment e.g. gloves, protective goggles etc.

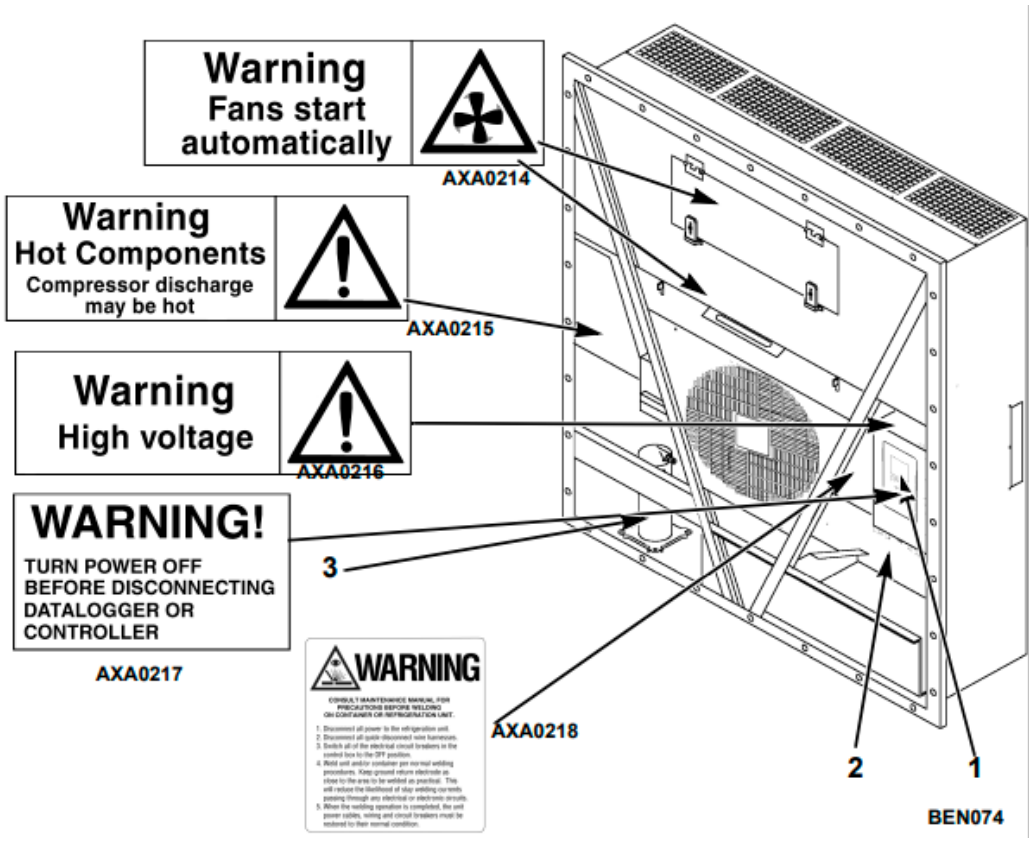
See section: *Safety data sheets (refrigerant, chemicals, cleaning agents, etc.)*

2.5.1 Location of safety symbols and/or pictograms on the machine

Location of all safety symbols, -signs and pictograms and their meaning are described in the table below:

Safety symbol, -sign or pictogram	Description	Location
	Danger of electric shock!	At electrical enclosures and switch-boards. At controller. At customer power connection electrical board (plug)
	Danger of electrical shock! (residual voltages)	Location at the machine frequency converters At Controller At customer power connection electrical board (plug)
	Danger of hot surfaces!	At Compressor area
	Danger of extremely cold surface The pictogram must be supplement-ed with a subboard marked with the text “Extremely cold surfaces - Do not touch” close to the dangerous area.	Inside container, near machinery end
	Danger of contact with chemicals	At machinery side (or pipe)
	Emergency exit signage	At internal door side
	Emergency EXIT DO NOT BLOCK signage	At internal door side

Safety symbol, -sign or pictogram	Description	Location
	Escape hatch signage	On doors
	Pause Button	At internal entrance
	Push doors	On doors
	Mantrap internal release	On Doors
	Light switch	At internal entrance
	Mantrap switch	At internal entrance
	Opening this way	On door
	Escape route	On door



This safety symbol/pictogram should in text warn about:
The board contains equipment that maintains a dangerous electrical voltage until 3 minutes after the supply is disconnected. Therefore, work on the board or on the plant that requires the board to be voltageless must begin at least 5 minutes after the supply is interrupted. Prior to such operations, the voltage less condition shall be determined by appropriate measuring equipment.

2.5.2 Renewal of safety symbols, -sign and pictograms

- Damaged or missing safety symbols, warnings, instruction signs and designations must be replaced and placed on the original location.
- Never remove warnings, instruction signs and designations from the machine, as these may relate to important safety-related information.

See also section: *Marking assemblies, drawings.*

2.6 Pay attention to the machine

For both use and maintenance, the personnel must be aware of if the machine behaves unusually and of signs of possible defects. It may e.g. be changes of or deteriorated function, loosened parts or something unusual concerning movements, vibrations, sounds, noise, smell, light or heat generation.

There must be paid special attention to the real safety functions and safety devices that prevent access to the hazardous areas of the machine or shield personnel against hazards during normal use of the machine or in event of failure of the machine or components and equipment of the machine.

Safety functions and parts of the machine, which are an integral part of the safety-related configuration must perform faultless.

If the machine behaves unusually or has done so, it must be taken out of operation immedi-

ately until it has been established if it can pose a safety and health hazard. If it is the case, the machine must not be put in operation until the cause has been clarified, faults and deficiencies have been corrected, and it has been established that the machine behaves normally.

2.7 Use of personal protective equipment

The designated personal protective equipment must always be used according to company guidelines, the instruction handbook and safety data sheets as well as acc. applicable national rules.

In general, do not wear loose clothing, belting, strings, accessories, jewellery, etc. while operating or servicing the machine. Long hair must be piled-up or put into a hairnet.

General directions for personal protective equipment are as follows:

Safety footwear
Wear safety shoes where there is a risk of objects falling, or frost damage and where feet are generally exposed.

Protective gloves
Wear protective gloves during maintenance and cleaning, or frost damage for the operator/users and when hands are exposed to hazards.

Eye protection
Wear eye protection during maintenance and cleanings specific in the rear-end of machinery, and in general when eyes are exposed to hazards.

Ear protection
Wear ear protection during maintenance -and operation specific in the rear-end of machinery, and in general and generally, when ears are exposed to hazards.

Mask/respiratory protective equipment (if necessary)
Wear mask/respiratory protective equipment during maintenance and cleaning of the machine, and generally when there is a risk of inhalation of harmful refrigerant, particles or gases.

2.8 Safety functions, overview

Requirements for safety-related parts are determined in accordance with EN ISO 13849-1.

Safety function	Description	Performance Level	Safety category
Electronic safety switching devices for limiting the high-pressure system (SF01)	Limiting the pressure, triggering event 32,4 ± 0.5 bar bar (Safe condition 3-30 bar) Stop category 0-2 cf. DS/EN 60204-1. Response time: 200ms Cut out: 3240 ± 48 kPa, 32.4 ± 0.5 bar, 470 ± 7 psig Cut in: 2586 ± 262 kPa, 25.9 ± 2.6 bar, 375 ± 38 psig	Pl d	3
Electronic safety switching devices for limiting the low-pressure System (SF02)	Limiting the pressure, triggering event X -0.17 to -0.37 bar (Safe condition -0.17 to -0.37bar) Stop category 0-2 cf. DS/EN 60204-1. Response time: 200 ms Cut out: -17 to -37 kPa, -0.17 to -0.37 bar, 5 to 11 in. Hg vacuum Cut in: 28 to 48 kPa, 0.28 to 0.48 bar, 4 to 7 psig	Pl d	3
Pause Button (Pause function)	The machine is equipped with a Pause Button. If the Pause Button is activated: • The refrigerator/ventilator stops immediately the chilling air. • The compress., fans, motors are paused. • The ventilation is paused. The paused time is only temporary and remains in the pause position in 15 minutes.	N/A	N/A
Heating cable (De-iceing)	Reduce the accumulation of ice around the door. Plug connector is ensured to be plugged-in, and turned [ON]	N/A	N/A
Rotating Flash Beacon Alarm	The Beacon Alarm is activated by (PTAS) button. **See below in section:** *Person Trapped Alarm Switch (PTAS) + Pause Button (temporary)*	N/A	N/A
Escape Hatch	Allow a person to escape through a small door/hatch	N/A	N/A
Internal Release button	Allow a person to push a button to unlock the handle	N/A	N/A

2.8.1 Location of safety devices – Overview

The machine is equipped with the above-mentioned safety devices, which are located on:

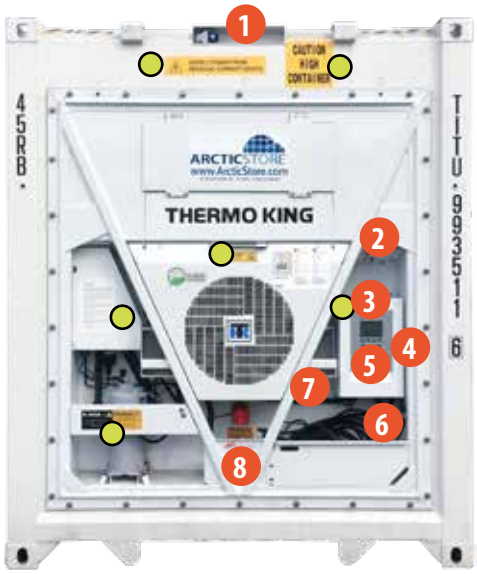
1. Front end	2. Rear end
• Lights Switch • Person Trapped Alarm Switch (PTAS) • Pause Button • Internal Release Button (no.5) • Escape Hatch	• HMI Display • Refrigeration unit • Discharge valve • Safety Relief Valve pressure, data-log, and history to be found in the HMI control system. • Rotating Flash Beacon • Power Supply Separator in the end of 18m. cable. • Siren See link to section: *Refrigeration system*

1.

When activate the button (PTAS):
One Flash-beacon lights up on top of container (no.3),
As well as the one in the rear of container, the refrigerator-end.
In same time a Sirene, beside beacon, will give a loud alarm sound.

2.

Always wear safety glasses when at the rear of machine as a safety precaution base on storage of refrigeration gases and other fluids incorporated into the refrigeration equipment.



1. ***Power to internal***
2. ***Fresh air valve***
3. ***Display temperature***
4. ***On/Off***
5. ***Control box***
6. ***380/440V power cable and 220/240V lead to 1***
7. ***CE approval decal.***
8. ***Man trap, beacon/siren***

Warning signs.

1. **Internal LED lights**
2. **Light switch and trapped personnel door**
3. **Emergency exit sign**
4. **Information and general overview decal**
5. **Internal emergency door release**
6. **Fluorescent safety information and illustrations**
7. **Escape hatch**
8. **Sliding strip curtain.**
9. **Ramp – max. load capacity 500 kg.**

Activation of safety devices such as [Pause Button] stops the following equipment:

- This will stop the refrigeration/ventilation unit from cycling, but starts automatically again within 15 minutes

Attention! Always keep the **[Discharge Valve] in "OPEN"** position under start-up and under operations else the internal pressure can explode the refrigerator system! (if the fuse plug is defect) and destroy machinery.

See also the section before: *Safety functions, overview*

2.8.2 Test of safety functions

If the following test limits are exceeded, the safety functions may no longer be considered active and will not protect users from machine hazards.

The safety functions (such as especially the pressure relief valve (PL d), latches of the escape hatch, pause button, alarm button and internal release switch (for opening the doorway), light switch and others etc.) **SHALL** be tested more than once a year.

See safety-related maintenance in section: *Inspection, testing and maintenance of the machine and its accessories.*

2.8.3 If an emergency occurs

There are **NO** emergency stop button!

- "The emergency stop" button inside TITAN Containers is only a temporary stop, referred to as the [Pause Button] of the refrigeration unit/cooling air fan.

See section: *Procedure - Isolation of energy/power supply*

An emergency occurs - It is needed to stop the TITAN Containers and prevent a new startup:

- If time - the supply power (Main switch) requires to be disconnected in "OFF" position, and then separate the main supply separator.
- If no time! - it's possible to separate the main supply separator, located on the wire to the machine, without disconnecting the supply power (Main switch).
- Next follow the LockOut and TagOut procedure.

See section: *Energy isolation.*

2.8.4 Person Trapped Alarm Switch (PTAS) + Pause Button (temporary)

Activation of (PTAS) Button

[Person Trapped Alarm Switch]
Alarm switch, the lower button, include loud Siren, and flash beacon outside.

Dangerous situations may occur during operation where it is necessary to make an immediate stop to the cooling air in Machine. If someone would be trapped inside and couldn't get out.
Another mobile beacon is supplied, it is recommended to put it in the front (near door) where it is visible in case of emergency.

2.8.4.1 Function of buttons:

1. **Pause button**
2. **Light Switch**
3. **Person Trapped Alarm Switch**

- Use the button [1] & [3] in this case someone would be trapped inside and couldn't get out Activate the (2) [**Light Switch**] - it's the upper button in same panel as (3) It will turn-on the 3 Fluorescent LED lamps in the ceiling inside the container.
- Activate the (1) [**Pause Button**] this will stop the refrigeration unit from the colling cycling temporary - the machine will automatically restart after 15 minutes.
- Activate the **(3) Emergency – [Person Trapped Alarm Switch]**. with the alarm clock pictogram Lower switch in same panel.

2.8.4.3 Trapped inside – Emergency - Access Door

Internal Release Button

In case if a person got trapped inside – it's possible to use the easy access door, the single hand opening button **[internal Release]**

2.8.4.3 Procedure – Access Doorway, or Escape Hatch

If trapped inside the container:

1. Press the **[Person Trapped Alarm Switch]** **(See above:** *Function of buttons)* located next to the light switch inside the container and ensure Push the **[Pause button]** to stop the refrigeration machine.
2. Press the **[Internal Release]** to open the door from the inside or get out from and push the big **[Access Door]** with a strong hit with your hands, or your leg/feet at the same time.
3. If the **[Access Door]** doesn't open - for whatever reason, open the handlatches of the **[Escape Hatch]** and get out the container through the opening.

[Pause Button] when Load-/unloading
We recommend using button [1], also when you enter the container for loading/unloading.

So that the reefer will stop running, and then it will not blow the cold air out through the open door that would cause that warm air is sucked in, and the moisture from the warm air would become ice inside the container.

[Pause Button] must never be used to prevent unexpected start-up.

Following situations may require "emergency stop" of the machine:

- A dangerous situation
- The occurrence of sudden unknown conditions, e.g. abnormal noises (rumbling, knocking) or movements of machine parts.
- Faults in safety equipment that cannot be replaced/repaired during normal operation.
- In the event of breakages and leaks that cannot be immediately eliminated.

2.8.5 Restart after safety stop

Before resetting the emergency stop, an inspection of all parts of the machine must be performed to find and remove the cause of the activation.
Before the Machine can be restarted, the Pause Button/Stop must be reset (turn the knob or pull out) and reset on the control panel, after which start-up is possible.
It **SHALL** be ensured that there are no personnel, items, tools, etc. at/on or around the dangerous parts of the machine before start-up.
See current operating instructions and workplace instructions.

2.9 Emergency situations

2.9.1 Operating method in the event of accidents or breakdown

In the event of accidents or breakdowns, personnel and users of the machine must:

- Assess the danger and sources of danger associated with the accident or breakdown, e.g. jamming, ejection of parts, etc. escape routes must be used, when personnel are exposed to immediate danger.
- Activate STOP-procedure on the machine to stop the machine.
- Assess the extent of the damage.
- Contact emergency services in the event of serious accidents.
- Where appropriate, remove guards to facilitate access to the area and the injured personnel.
- Identify potential dangers associated with removed guards e.g. sharp objects, components etc.

- Turn-off the power and follow the instruction and procedure of disconnect the power via the main supply separator and follow the LockOut-TagOut procedures depending on, how serious the situation is.

See section: *Isolation and locking*

2.9.1.1 Means to fight against dangerous substances

Warnings!

- Never apply heat to a sealed refrigeration system or container. Fluorocarbon refrigerants produce toxic gases in the presence of an open flame or electrical arc the gases are severe respiratory irritants capable of causing death.
- Display caution when working with a refrigerant or refrigeration system in any closed or confined area with a limited air supply (for example, a trailer, container or in the hold of a ship). Refrigerant will displace air and can cause oxygen depletion. This can result in suffocation and possible fatality.

2.9.1.2 Fire-fighting equipment

It is the end-user/customers responsibility to inform all users groups, where to find the fire-fighting equipment.
Risk of fire departing from controller may exist, so fire extinguisher for electrical parts is needed (foam or powder).

2.9.1.3 Emergency exit - Emergency Hatch - Firefighting equipment

- Gain knowledge of the location of emergency stops, safety equipment, fire-fighting equipment and first-aid equipment.
- Gain knowledge of the location of safe access routes and emergency exits.
- If anyone should become trapped inside
- Press the person trapped alarm switch
- Then press the pause button, this will stop the refrigeration unit from cycling.
- Firmly press the Internal 'Emergency Door Release' or exit via the 'Escape Hatch' located in the door.
- Emergency exit signs are always placed to indicate the route to the nearest emergency exit. At TITAN Containers - Thermo King Magnum Plus.
- There are as standard, one Emergency Hatch, located at the doorway, just behind the ramp. *See the figure below.*

EMERGENCY HATCH
Since May 2019, an emergency hatch has been introduced on new containers of the CE type as an additional safety precaution.

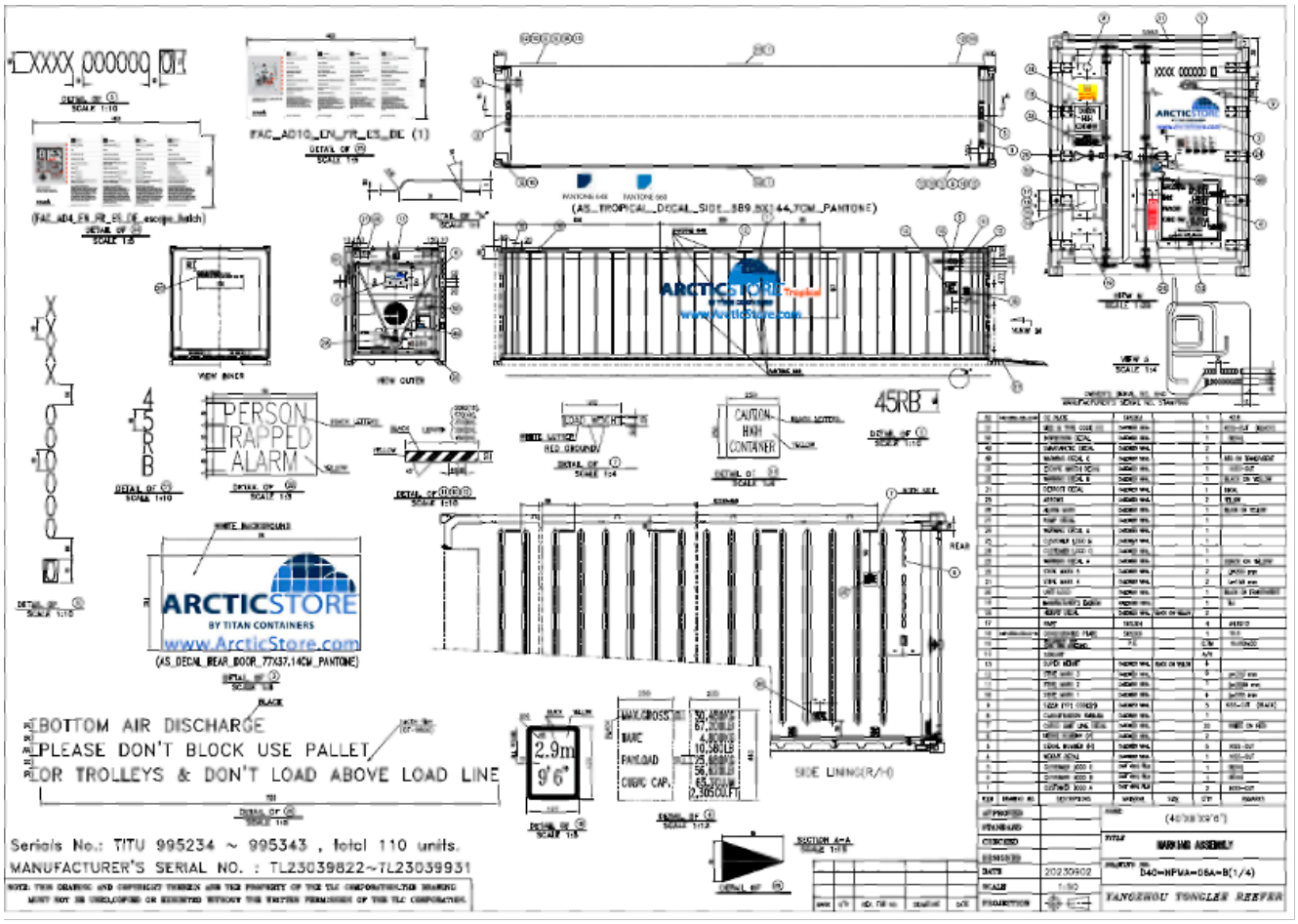
For more information, please contact TITAN.

3 Machine overview

Machine overview for individual machines can be found in the corresponding sections in the associated operating instructions. **See the section:** *Associated user documentation.*

3.1 Machine description

The machine consists of a container with a machinery.



Also find this a big version under section: *Marking assemblies, drawings.*

3.2 Product Overview

3.2.1 Description of the Temperature Controlled

This manual applies to 10ft, 20ft & 40ft portable temperature-controlled storage containers

3.2.2 Key Features and Components

- Lights: LED Light, 5500K, 220V, 20W, IP65
- Alarm System: 220V IP65, 10W
- Pause button: Press the button, the machine will be paused and automatically starts again within 15 minutes.
- Heating cable: Reduce the accumulation of ice around the door. Plug in the socket to work.
- Easy Open Door:
- 1/3 and 2/3 CE easy access door single hand opening with internal release
- Escape Hatch: in case of a person becoming trapped inside

- Curtain: Reduce cold exchange while door is opened to prevent / reduce ice-build up.
- Anti-slip Flat floor: Easy operation for trolleys and pallet lift. It's not recommended to use motorised forklift (pallet lift is okay) but not forklift due to floor resistance.
- Cooling machine MP4000 controller, R452a/ R404a

3.2.3 Magnum units' description

Introduction

This chapter will briefly describe the following items:

- General Unit Description
- Standard Component Descriptions
- Optional Component Descriptions

General description

MAGNUM units are all-electric, single piece refrigeration units with bottom air supply. The unit is designed to cool and heat containers for storage of cargo and shipboard or overland transit. The unit mounts in the front wall of the container. Forklift pockets are provided for installation and removal of the unit.

The frame and bulkhead panels are constructed of aluminium and are treated to resist corrosion. A removable evaporator compartment door provides service access. All components except the evaporator coil and electrical heaters can be replaced from outside, from the front of the unit. Each unit is equipped with an 18m (60 ft) power cable for operation on 5 core x 4 mm2, 460-380V/3 Ph/60-50Hz power H07RN-F. With 5-pin plug (3-phases + neutral + ground). The unit power cable is stored below the control box in the condenser section.

Each unit is equipped with 460/380V/3 Ph/60-50Hz electric motors. An automatic phase correction system provides the proper electrical phase sequence for condenser fan, evaporator fan & compressor operation.

3.3 Intended use

This TITAN Containers Thermo King Magnum plus-machine is intended for use for the following Scenarios: Energy efficient storage of temperature sensitive cargo.
Users: Farmers, Processing plant, Supermarket, Pharma industry and anyone who needs temperature-controlled storage.

Thermo King Magnum plus Machine:

1. **Internal LED lights**
2. **Light switch and trapped personnel Switches**
3. **Emergency exit sign**
4. **Information and general overview decal**
5. **Internal emergency door release**
6. **Fluorescent safety information and illustrations**
7. **Escape hatch**
8. **Sliding strip curtain.**
9. **Ramp – max. load capacity 500 kg.**

3.4 Prohibited applications

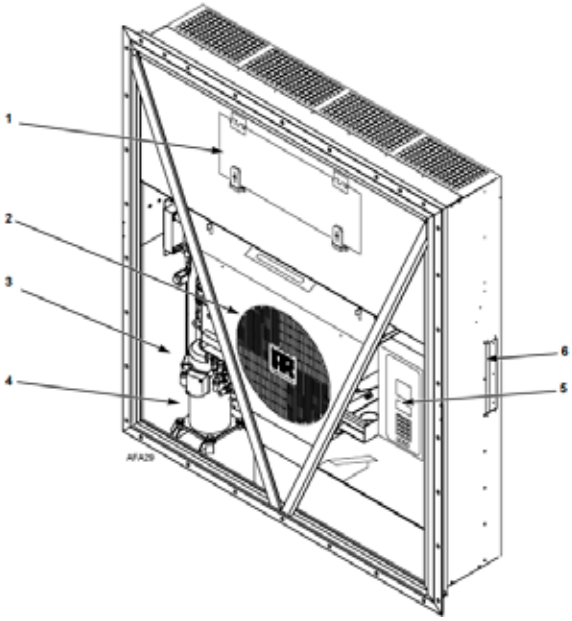
- The Machine may only be used as intended.
- Maintenance and separation must not be carried out on the machinery to be cleaned.

The instruction handbook and risk assessment must be reviewed and corrected if changes are made to the machine.
Under no circumstances should personnel acquire access behind guards of the machine unless the machine is in a safe condition where the supply disconnecting device is in the "OFF" position and locked. (LockOut-TagOut)
The machine must be taken out of operation as soon as faults or defects are found which can pose a safety and health hazard. The machine must not be used until faults or defects have been rectified.

3.5 Technical specifications

Technical specifications of individual machines
Technical specifications of individual machines can be found in the corresponding sections in the associated operating instructions. **See the section:** *Associated user documentation.*

See section: *Nameplate text*



Containers rear-end
Door access to evaporator
4. Condensor fan
5. Compressor area
6. Compressor Scroll
7. Controller
8. Data download port

Find more relevant information in:
Associated user documentation.

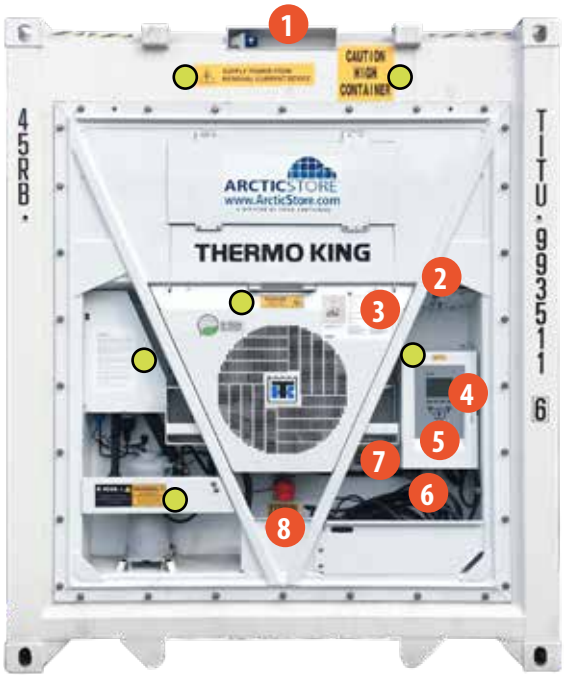


Figure 5.2.1 Thermo King™ MAGNUM PLUS machine
1. **220V for internal electrical fittings.**
2. **Fresh air valve.**
3. **General overview decal.**
4. **Control box with LCD screen. Optional remote monitoring.**
5. **On/off switch.**
6. **380/440V power cable with 32A CE plug.**
7. **CE approval decal.**
8. **Trapped personnel alarm with siren and flash beacon.**

Warning signs.

3.5.1 Dimensions

See section: *The machine and/or the components, dimensions, mass during transportation.*

3.5.2 Weight

See section: *The machine and/or the components, dimensions, mass during transportation.*

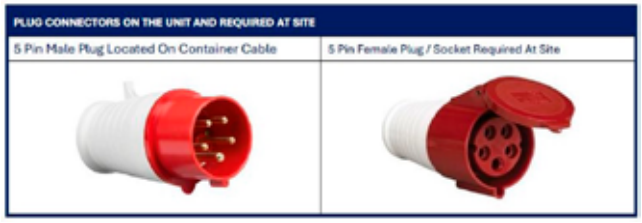
3.5.3 Power supply

3.5.3.1 Electrical

Rated voltage:	3 x 400/440V + N + PE
Frequency:	50/60Hz
Full-load current:	17A

3.5.3.2 Electrical Connections

The TITAN Containers cable will terminate in a 5-pin male plug(6h,3P+N+E) and requires a mating 5 pin female socket at site, per below images. The 5-pin female can be in either wall mounted socket form or cable socket form.



Attention!

Beware of the procedure when preparing TITAN Containers for repairing or service > turn [OFF] and disconnect in right way. Not at least to know when LOTO procedure are required!

See section: *Energy isolation.*

3.5.4 Emission, noise

Airborne noise emission from the machine:
In the rear-end/refrigerator machine end – the noise is highest, and more the 90 dBa inside container. The noise level is measured to:

- 90.1dB(A) with set-point -30°C running 400V/50Hz. (inside).
- 94.9dB(A) with set-point -30°C running 400V/60Hz. (inside).

(Sound level measuring followed as per ISO 3744:2010).

In general wear ear protection during maintenance of the machine, and generally when ears are exposed to hazards, especially in machine's rear end.

Reaching points

- When reaching the noise-level above 80dB, its recommended to use ear protection.
- When reaching the noise-level above 85dB, end user-customer are required to provide the hearing protection for the user.

3.5.5 Operating conditions

The machine may only be used in an outdoor or indoor industrial environment. This means that rainwater, frost and generally extreme temperatures are not foreseeable.

Environment	
Permitted temperature range	- 30°C to +70°C
Permitted relative humidity (Non condensing)	Min. 20 % Max. 90 %
Ocean Environment	Saltladen air, sea spray, high humidity and severe atmospheric conditions
Atmospheric pressure	800 hPa to 1000 hPa
EMC-environment	B

Lighting	
Machine premises (inside storeroom)	Min. 100 lux
Repair and maintenance	Min. 200 lux In case of repair and maintenance, sufficient light must be provided, if necessary to complete the task.

3.5.6 Intended life limit of the machine

The lifetime of the machine is rated by the manufacturer to 15 years for the cooling machinery and 50 years for the box itself. If the machine is to be used for a longer period, the owner/user

of the machine must assess whether the structural and functional parts of the machine still have their original strength, stability, etc. If this is not the case, the parts must be replaced with parts with identical or better properties.

3.5.7 Intended life limit of safety related components

The safety-related parts of the control system must be replaced after a maximum of 10 years of operation if the machine is to continue its operation.
Safety related components need to replace with parts with identical or better performance before reaching the end of their lifetime.

3.6 Operator positions, placement and arrangement

Space requirements for people working on the machine:
There must be sufficient space for the operator to use appropriate working positions and movements.
The free aisle width, where access is often required, must be at least 1500 mm.
Recommended aisle width between barriers (walls, building parts, etc.) and control devices: at least 700 mm.
The following applies to electricity and control panels: All doors must be able to open at least 95 °.

3.7 Controls, display and interfaces

The HMI display on the controller MP-4000 is situated in the rear-end of container at right side of refrigeration unit.

Overview:
The MAGNUM+ container unit
Features the following components:

- Scroll Compressor
- Compressor Digital Control Valve
- Economizer Heat Exchange System
- Temperature Sensors
- Fresh Air Exchange System
- Temperature Sensors
- Fresh Air Exchange System
- Receiver Tank Sight Glass
- Evaporator Fans
- Condenser Fan Control
- Suction/Discharge Pressure Sensor (Optional)
- Remote Monitoring Receptacle Option (4-pin) (Optional)
- Remote Monitoring Modem (RMM, RMM+) (Optional)
- USDA Cold Temperature Treatment Recording (Optional)
- Advanced Fresh Air Management (AFAM) and Advanced Fresh Air Management plus (AFAM+) (Optional)

MP-4000 Controller
The MP-4000 is an advanced microprocessor controller that has been specially developed for the control and monitoring of refrigeration units. See "Controller Description & Operating Chapter for more detailed information.

See Controller Description & Operating Chapter: *Specific Thermo King – Operator's Manual, and other documentation.*

4 Transportation, handling and storage

Transportation, handling and storage
Information on safe transportation, handling and storage of individual machines can be found in the associated instructions. **See the section:** *Associated user documentation.*

4.1 The machine and/or the components, dimensions, mass during transportation

TITAN Containers
- Thermo King Magnum plus (10FT)
Max. Gross: 10 160 Kg.
Tare: 2 090 Kg.
Net/Payload: 8 070 Kg.

TITAN Containers
- Thermo King Magnum plus (20FT)
Max. Gross: 24 000 Kg.
Tare: 2 910 Kg.
Net/Payload: 21 090 Kg.

TITAN Containers
- Thermo King Magnum plus (40FT)
Max. Gross: 30 480 Kg.
Tare: 4 700 Kg.
Net/Payload: 25 780 Kg.

TITAN Containers - Thermo King Magnum plus

Magnum +	Outside measuring (mm)			Inside measuring (mm)		
Sizes	Length	Width	Height	Length	Width	Height
10ft	2991	2438	2591	2296	2292	2310
20ft	6058	2438	2591	5363	2292	2310
40ft HC	12192	2438	2896	11497	2292	2605

TITAN Containers - Thermo King Magnum plus

Magnum +	Pallets	Max. weight	Own weight	Max. load weight
Sizes	EU	Kg	Kg	Kg
10ft	4	10160	2090	8070
20ft	10	24000	2910	21090
40ft	22	30480	4650	25830

4.2 Gripping/lifting points

The gripping and lifting points of TITAN Containers are, unless otherwise described, located regarding the centre of gravity of the workpiece for a safe and optimal lift.

- To lift the TITAN Containers, attach lifting straps, slings or chains to the gripping and lifting points of the TITAN Containers.
- For lifting operations only use approved lifting equipment which must be suitable for the purpose.

See also sections: *Certificates and other declarations.*

4.3 Unloading zone – for unloading or relocating the container

- Ensure that the intended location for the container is suitable, and that the area has been ade-quately prepared prior to delivery.
- Ensure that there are no overhanging power or phone cables, branches, signs, street lighting or any other hindrances which may hinder/impede the delivery of the container or cause a dangerous situation.
- Ensure the availability of a 400/440V electrical connection for 32Amp within max. 18 meters from the container refrigeration machine.
- Unloading normally takes place with either crane, tilt trailer or side loader.

During unloading/delivery it is the - responsibility of customer:

- Ensure there is space for the delivery vehicle(s) to manoeuvre as required.
- Access ways are free both for unloading and loading, and that the surface is firm, level and stable.
- There is adequate space for the driver to use safely deliver the container without hindrance danger or delay.

See also section: *Site preparation*

4.4 Transportation- and handling method

Danger of drop or collision with lifted load
During operation, loads are transported within the work area, which can cause irreversible damage if dropped, as well as crushing hazard between the load and structural elements.

During transportation of loads, crushing hazards may occur between moving parts and the floor, and the load may fall. Never walk under a hanging load.

The following precautions must be followed during transport of loads:

- Plan the lift and use proper lifting equipment.
- Handling and lifting the load must be carried out in accordance with the directions on the load.
- Exercise caution when transporting loads.
- Establish a full overview of the moving parts and the immediate area.
- Keep unwanted personnel away from moving parts and their adjacent area.

4.4.1 Personal protective equipment

When transporting and handling parts, the following personal protective equipment must be worn:

Head protection
Use head protection when items are transported by crane or similar, or when loads are transported above shoulder height.

Protective gloves
Use protective gloves where hands are generally exposed.

Safety footwear
Wear safety shoes where there is a risk of objects falling and where feet are generally exposed.

4.4.2 Required skill and equipment

Skill requirements:

- The personnel who handle the transport and handling of the machine must be trained in accordance with existing legislation.
- If required, crane and handling license is compulsory.

Equipment requirements:

Forklifts and cranes, lifting equipment must meet the following minimum requirements:

- Check that the equipment has been inspected and approved in accordance with applicable international and national regulations.
- Check that the equipment has sufficient lifting capacity.
- The total weight of the item must be within the capacity of the equipment, see transport papers or type plate.
- Check if relevant that the equipment has a sufficient fork length and a sufficient fork distance.
- Ensure that crane or lorry drivers have driving licence and operator license.

4.5 Storage

4.5.1 Environmental conditions

When put in storage, the machine or machine parts must be stored under the same environmental conditions as during operation, **see section:** *Operating conditions.*

Storage of individual components etc. must be done according to the instructions in the component data sheets.

5 Assembly, installation and commissioning

When received the machine it's already assembled, installed, tested and commissioned. Ready to complete the installation/commissioning, last check on-site and put into service according to the supplier's recommendations.

TITAN Containers is specially designed and CE-marked for its purpose - and may not be used in its entirety for other purposes.

For customer/end-user its necessary and required to prepare the site – electrical connection as described below, ensure to read this: **The Original Instruction Handbook complete – also important is especially the chapter:** *Safety.*

Assembly, installation and commissioning of individual machines, inside the container are done together with the Factory acceptance test (FAT) and ready for installation on-sites. Information on the final installation at end-user/customers site, can be found in this Original Instruction Handbook, but also specific information get the *Overview* of what's inside and how to do – **find it in the section:** *Specific Thermo King – Operator's Manual and documentation.*

Exception: if the machine commissioned, installed by the manufacturer or under the manufacturer's responsibility, procedures for final installation, commissioning and first use may not be available in the associated instructions, but just handed down from TITAN Containers A/S.

This section describes instructions for site preparation and installing the machine. If any waste from on reception, installation process must be disposed of in accordance with applicable national and regional regulations.
See section: *Disposal, destruction and recycling.*

5.1 Site preparation

The location where the container is located must meet the following requirements. Insufficient strength of the floor or foundation, levelling or ability to attach the machine to the surface can cause insufficient stability of the unit's operation and contents.

The container should be placed on hard, levelled concrete ground or support points under the 4 corners and on 3 additional points along the bottom side beam at equal intervals.

Electrical Connection
Ensure the availability of a 400/440V electrical connection for 32Amp within, max.18 metres from the container refrigeration machine.

See section for: *Power supply*

5.1.1 EMC emissions

The machine is designed and constructed so that the emission of the electromagnetic radiation is maintained at a level, which is not harmful to humans or may interfere with other machines in the vicinity.

5.1.2 Positioning and levelling of the Container

- If the ground is not level the container must be levelled using adequate packing, such as reinforced concrete slabs and shims, to level it appropriately.
- If the unit is not levelled it can also affect the unit's operation and contents.

See also section: *Unloading zone – for unloading or relocating the container*

5.1.3 Requirement to the supporting base

See section, and find the actual sizes and weight: *Technical specifications*

5.1.4 Space requirements and means of access.

The machine must be set-up in compliance with the space requirements listed in section: *Operator positions, placement and arrangement.*

5.1.5 Testing requirements

TITAN Containers A/S has already done a fully functional test before delivery (at depot) called PTI (Pre-Trip Inspection).

5.1.6 Stable installation

The machine shall be fixed in a way that will ensure that the machine will not move or come lose.

The machine shall be installed on a level, horizontal and stabile surface, which shall be able to support the machine without slipping or tilting.

5.1.7 Special tools and equipment

When using tools near electrical equipment – always use with insulated handles, cables and tools in good conditions.

Preparing of support

Positioning at final location

5.2 Installation

Electrical installation of the machine must follow the instructions below.

5.2.1 Electrical installation

Installation of electronic components must be carried out in accordance with the component manufacturer's instructions.

5.2.1.1 Protective bonding

Warning!
Risk of electric shock!
If a live part contacts the machine frame, there is a risk of electric shock.

Potential bonding must be established for safe machine operation throughout the exposed conductive parts of the machine, as well as surrounding exposed conductive parts.

See section: *Energy control procedures*

Connections must be deenergized during installation and secured against unintentional power up.
Only authorized professionals may carry out the electrical installation and connection of the machine.
The connection point must be suitable for the machine's electrical specifications.
See section: *Power supply – Electrical.*

5.3 Commissioning

Special attention must be paid to the safety-related components and verify that these work as intended.

See the section: *Inspections, testing and maintenance of the machine and its accessories.*

The following points may be relevant for the entry into service of the given Machine:

- Specific risks and precautions to be taken see above points about safety functions and danger.
- Information on specific procedures for putting into service if required see above points about LO-TO and electrical danger.

6 Original equipment manufacturer settings

Original equipment manufacturer settings of individual machines
For information on factory settings of individual machines, please refer to the relevant instructions for use.
See the Related User Documentation section: *Associated user documentation*

6.1 Safety-related parameters

See the Related User Documentation section: *Associated user documentation*

6.2 Electrical settings

See the Related User Documentation section: *Associated user documentation*

6.3 Other settings

See the Related User Documentation section: *Associated user documentation*

7 Operation of TITAN Containers

Operation of individual machines
For information on the operation of the individual machines, as well as a description of their operating devices and/or descriptions for joint control.
See the section: *Associated user documentation.*

Machine operation must comply with the intended use of the machine.
See section: *Intended use.*

- Check the conformity between the use of the machine and the intended use before commissioning.

7.1 Risks and hazards

7.1.1 Training

All users must have gone through all safety aspects described in section *Safety* before operating the machine for the first time. The training must ensure that users are aware of the risks and hazards that exist on the machine.

7.2 Controls

Associated user documentation.

7.3 Operating modes

Associated user documentation.

- Normal operation
- Maintenance
- Cleaning and disinfection
- Error mode (Alarm/warning)

7.4 Procedure for refill or replace of R-452a/R404a

The procedure for filling refrigerant to the cooling system must only to be done by skilled persons!

Always replace the R404a by R452a in case of leakage of R404a. It is prohibited to refill R404a.

Always store and handle R-452A cylinders in an upright position and in a cool, dry place away from direct sunlight and heat sources.

Associated user documentation.

7.5 Location of the intended operator positions

When the machine is in normal operation the operator positions will be in the front of container, at the entry via the ramp/doors it's possible to go inside.

If the operator's need to start-up/re-start, stop or adjust some settings, temperatures, timers etc. the HMI control-panel can be operated from the rear-end of the container, from where the operator has a clear overview of the running machinery, fans, refrigerator system etc.

See also the section: *Operator positions, placement and arrangement*

Workplace - at the front of Container, entry via the ramp

Workplace - at the rear-end of Container HMI panel located in right-side

7.6 Error messages

TK Magnum error code/alarm manuals.

See section: *Associated user documentation*

7.7 Personal protective equipment

See section: *Personal protective equipment*

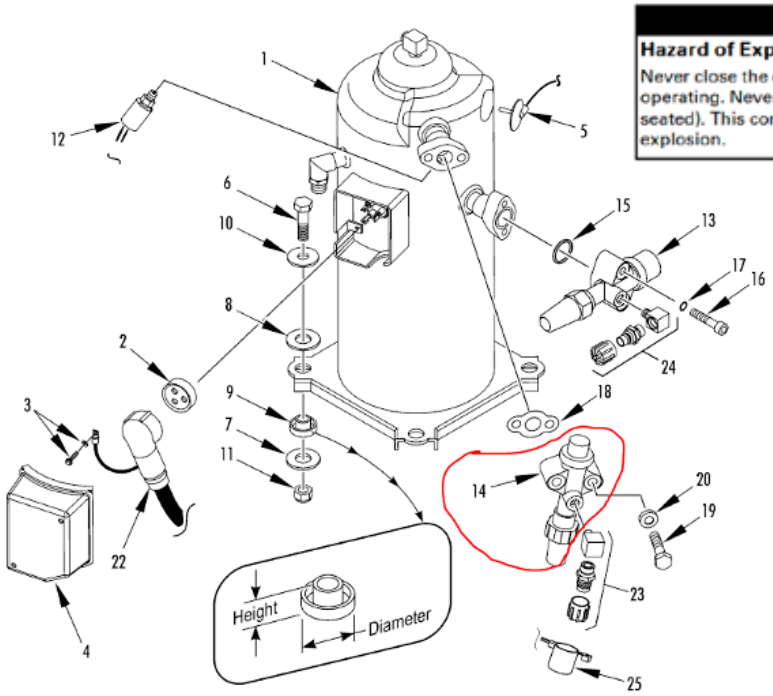
7.8 Procedures

7.8.1 Starting-up

Before starting the machine, the operator must observe the Machine:

- Keep the area around the machine free of junk and items.
- Also, the floor inside the storeroom must be kept clean of items and fluid spillage before starting the refrigeration system. The floors may still be slippery and therefore proper footwear is needed when access the container.
- Ensure that no persons or animals are inside the container or located within the hazardous areas in the rear-end/refrigerator end.
- Ensure the compressor discharge service valve is in "open" position.

7.8.1.1 Discharge Service Valve – Attention and preparation



⚠ WARNING

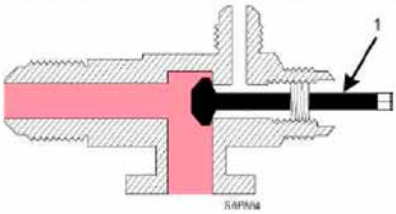
Hazard of Explosion!

Never close the compressor discharge service valve when the unit is operating. Never operate the unit with the discharge valve closed (front seated). This condition increases internal pressure, which can cause an explosion.

Warning!

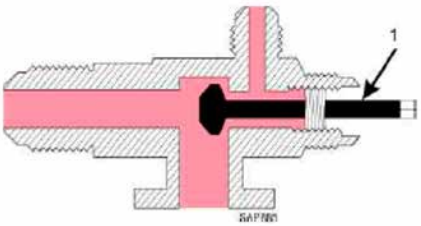
Ensure that the Discharge Service Valve under operations, is in open position!

Service Valve Back Seated (Operating Position)



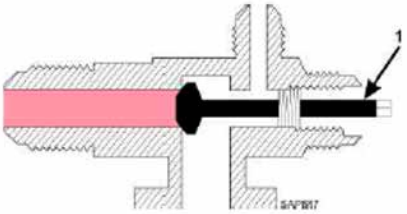
1	Full Counterclockwise

Service Valve Open to Port (Servicing Position)



1	1/2 Turn In

Service Valve Front Seated (Check or Remove Compressor)



1	Full Clockwise

7.8.2 Start procedure:

1. Connect power cable to appropriate socket
2. Check all circuit breakers are on position "ON"
3. Switch on unit by pressing "ON" button

See section: *Associated user documentation*

7.8.3 Control during operation

7.8.3.1 Operating parameters, adjustments:

See section: *Associated user documentation*

7.8.4 Stopping

7.8.4.1 Normal stop procedure:

1. Press OFF button
2. Disconnect power cable from socket

7.8.5 Emergency situations

There is NO "Emergency Stop" button! – But in dangerous situations may occur during operation where it is necessary to make an immediate stop of the machine or parts thereof. If such a situation occurs, activate from inside the container, the [**Pause Button**] to stop the machine, the cooling fans / refrigerator parts immediately. And if necessary, also activate the [**Person Trapped Alarm Switch**].

Following situations may require "emergency stop" of the machine:

- A dangerous situation.
- The occurrence of sudden unknown conditions, e.g. abnormal noises (rumbling, knocking) or movements of machine parts.
- Faults in safety equipment that cannot be replaced/repaired during normal operation.
- In the event of breakages and leaks that cannot be immediately eliminated.

In the event of unintentional safety-relevant changes to operating characteristics that have led to an "emergency stop" situation, the fault must be reported immediately to the safety representative/or person in charge.

"Emergency stop" the [**Pause Button**] must never be used to prevent unexpected start-up. In the event of a fire, the local emergency plan must be followed. If personnel sustain extensive injuries, the emergency services centre must be contacted.

7.8.6 Reset

7.8.6.1 In the event of safety stop:

An inspection of the machine or part thereof must be performed to find and correct the cause of the activation before resetting the machine.
Before restarting the machine, a reset must by executed on the safety device and on the machine controls.
Before a new start-up, it must be checked that there are no personnel, items, tools or the like within or around the hazardous areas of the machine.

See section: *Energy control procedures*

7.8.6.2 In the event of overload:

In the event of an overload, the overload protection of the loaded motor or the frequency converter will disconnect the motor.
An inspection of the machine or part thereof must be performed to find and correct the cause of the activation before resetting the overload protection or frequency converter of the motor. An additional reset may be required on the machine controls.
Before a new start-up, it must be checked that there are no personnel, items, tools or the like within or around the hazardous areas of the machine.
The operator must inspect the entire machine for faults and defects before reset.

7.8.7 Restarting

See section: *Associated user documentation*

In the event of required restart, the following procedure must be followed:

1. Stop the machine and isolate the energy supply, **see section:** *Energy control procedures*
2. Remove any material/product from the ma-

chine that can hinder normal operation. E.g. an overturned pallet.
3. If relevant, reset the machine.
4. Initiate normal starting procedure.

See section: *Starting*

7.8.8 Machine start-up and shutdown

Start the machine, **see section:** *Start procedure.*
Stop the machine, **see section:** *Stopping.*

If it's needed to isolate the energy supply, **see section:** *Energy control procedures*

7.9 Sequence or chronology of operations

The instructions for use shall indicate the function and operation, including the relevant ones of the following:
See section: *Associated user documentation*

7.10 Removal of waste from container-operations

- Product residue from production (goods for destruction, -expiry date has been exceeded, or from the machinery side, leak of refrigerant, etc.)
- If necessary, refer for proper disposal.

EXAMPLE:
Waste must be removed according to the following procedure:
1. Remove any material/product/pallets from the machine (E.g. packaging on the floor). If materials are in a hazard zone, the machine must be stopped.
   See section: *Stopping*
2. Dispose materials according to national guidelines.
3. If relevant, reset the machine.
4. Initiate normal starting procedure.
   See section: *Starting.*

7.11 Operations to be performed by more than one operator

Warning!
Lack of operators can lead to injury.
A single operator must not operate the machine, as this can create dangerous operating situations, as well as inappropriate working positions.

7.11.1 Situations where 2 operators can be an advantage

Watch the doors during wind/stormy weather – to ensure safety entry into the container room the doors can be kept open by a colleague – and else the ensure the doorway by using the safety-chains.

See also section: *Securing/lock*

When changing heavy parts such as compressor, doors etc. – to ensure safety, it is required to have 2 operators to lift and share the weight. Safety equipment must be used and wore. Where applicable, forklift should be used.

8 Product or capacity changeover

8.1 Energy changes

In case of power failure, machinery will stop running. Precaution to switch ON again must be followed as stated above.

8.2 Changes in data or operation parameters

See section: *Associated user documentation*

8.3 Process changeover from cooling to heating

See section: *Associated user documentation*

9 Inspection, testing and maintenance

For general inquiries please contact your local TITAN Containers.
Go to: *www.TITANContainers.com*
And select agency locator for your local TITAN Containers service for contact information.

Inspection, testing and maintenance of individual machines
The manufacturer's inspection and testing intervals for the individual machines must be complied with as specified in the associated operating instructions.
See the section*: Specific Thermo King – Operator's Manual and documentation.*

Before starting work, repairers and maintenance personnel must be instructed in hidden hazards, such as electrical hazards and crushing hazards.

This prevents unintentional starting and contact with live parts.

In operating situations where personnel have disassembled parts of the machine, or are handling spare parts or tools, these personnel must be instructed to exercise special care with moving parts or the like.

9.1 Characteristics of substances used

Refrigerant Hazards
Specifications of used cooling liquids: R452a
R452a has been classified as A1 non-flammable by Ashrae (The American Society of Heating, Refrigerating, and Air-Conditioning Engineers) it can also be used to retrofit existing systems.

Refrigerant Properties	R452a
Boiling Point at 1 Bar (°C/°F)	-47/-52.6
Critical temperature (°C/°F)	74.9/166.8
Critical pressure (bar abs/PSIG)	40.0/580.2
Liquid density at 32°C/90° (Kg/m3)	1093
Vapor density at -30°C/-22°F (Kg/m3)	10.1

Specifications of used cooling liquids: R404a
R404a has been classified as A1 non-flammable by Ashrae (The American Society of Heating, Refrigerating, and Air-Conditioning Engineers) it can also be used to retrofit existing systems.

Refrigerant Properties	R404a
Boiling Point at 1 Bar (°C/°F)	-47/-52.6
Critical temperature (°C/°F)	74.9/166.8
Critical pressure (bar abs/PSIG)	40.0/580.2
Liquid density at 32°C/90° (Kg/m3)	1093
Vapor density at -30°C/-22°F (Kg/m3)	10.1

DANGER

Hazardous Pressures!

Always store refrigerant in proper containers, out of direct sunlight and away from intense heat. Heat increases pressure inside storage containers, which can cause them to burst and could result in severe personal injury.

DANGER

Combustible Hazard!

Do not use oxygen (O2) or compressed air for leak testing. Oxygen mixed with refrigerant is combustible.

WARNING

Hazardous Gases!

Do not use a Halide torch. When a flame meets refrigerant, toxic gases are produced. These gases can cause suffocation, even death.

WARNING

Personal Protective Equipment (PPE) Required!

Refrigerant in a liquid state evaporates rapidly when exposed to the atmosphere, freezing anything, it contacts. Wear butyl lined gloves and other clothing and eye wear when handling refrigerant to help prevent frostbite. When working with or around hazardous chemicals, always refer to appropriate Material Data Safety Sheets (MSDS) and OSHA/GHS (Global Harmonized System of Classification and Labelling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection, and handling instructions.

See section: *Personal protective equipment*

NOTICE

Equipment Damage!

When being transferred, refrigerant must be in liquid state to avoid possible equipment damage.

9.2 Safe execution of repair & maintenance operations

The following precautions apply to the machine - before starting repair, maintenance and service work, it must be ensured that:

- Establish a safe working environment where necessary (e.g. signage, cut-offs, etc.).
- Establish an overview of the connection and disconnection processes for the machine before starting maintenance.
- The machine's power supply cable is unplugged.
- The discharge time for dangerous residual voltage is completed.
- Bring additional lighting during maintenance where necessary to ensure proper working conditions.
- Familiarize yourself with and observe the prescribed setting, service and inspection activities, including information on replacing parts.
- It's not allowed to use oxygen (O2) to pressure- or leak test the cooling system. Oxygen and R452a mixed is combustible. Soapy water must be used instead.
- Personal protective equipment is used for the work task (chemicals and heat/cool surfaces).
- The hot surfaces of the machine have been cooled to a safe working temperature (below 60 °C) if there is a need for contact more than 5 seconds.
- The cold surfaces of the machine have reached a normal working temperature.

9.2.1 Personal protective equipment

Appropriate protective equipment must be used in accordance with the given maintenance task to be performed. In addition, the instructions for personal protective equipment in **section** *Safety* must be read carefully and followed, as well as directions for use of required protective equipment when using tools, auxiliary equipment, etc.
General instructions for personal protective equipment are as follows:

Safety footwear
Wear safety footwear (cold-resistant) during maintenance and cleaning of the machine, where there is a risk of falling objects and generally when feet are exposed to hazards: heavy loads, frostbit etc.

Protective gloves and clothing
Wear protective gloves (cold-resistant) when working inside container, during maintenance and cleaning of the machine, and generally when hands are exposed to hazards, e.g. heavy loads, frostbit etc.

- Risks of contact with cold surfaces during work on evaporators, pipes or handles, walls inside container - Maintenance personnel must use cold-resistant protective gloves and thermal clothing.
- Risk of frostbit if trapped inside.

Eye protection (if necessary)
Wear eye protection during maintenance and cleaning of the machine, and generally when eyes are exposed to hazards, e.g. leaks in refrigeration system, which under pressure as well.

Ear protection (if necessary)
Wear ear protection during maintenance of the machine, and generally when ears are exposed to hazards, especially in machine's rear end.

Mask/respiratory protective equipment (if necessary)
Wear mask/respiratory protective equipment during maintenance and cleaning of the machine, and generally when there is a risk of inhalation of harmful particles or e.g. gases from refrigerant-leak R452a

9.2.2 Lifting and handling of machine parts

For lifting operations, approved lifting equipment must be used, such as crane and hoist, chains or straps, when handling machine parts or components heavier than 15 kg.

9.2.3 Maintenance operations which require special technical knowledge

See the section for Maintenance manual:
Associated user documentation

9.2.4 Electrical maintenance

Warning!
Live parts!
Contact with dangerous voltages may result in serious injury or death.
Only instructed or skilled personnel when required also specially trained to the work in question may perform electrical maintenance on the machine!

9.2.5 Electrical work

Electrical work must be carried out in accordance with requirements and recommendations specified in EN 50110, including:

- Undertake an appropriate risk assessment before the work and implement necessary protective measures.
- Ensure to safeguard isolation levels during the work e.g. by using a robust insulation material.

Dead working:
Take care of the following essential requirements is fulfilled before the work is carried out to ensure that it can take place at no-voltage and securely for the duration of the work.

- Completely disconnection.
- Secured against reconnection.
- Verification of the installation is dead.
- Earthing and shortcircuiting are carried out.
- Protection against adjacent live parts is provided.

Any person engaged in the above shall be skilled or instructed or shall be supervised by such a person.

Live working:
Live working shall only be carried out according to national requirements and practices.

- The workplace must be stable, and the worker must have both hands free.
- Use suitable and adequate personal protective equipment. (Don't wear metallic items e.g. jewellery and watches, if it may pose a hazard).
- Depending on the kind of work, the worker shall be instructed or skilled and be specially trained to the job.
- Be aware of dangerous residual voltage

from frequency converters for some time after the disconnection.

The protective bonding must be reassembled correctly after repair, maintenance, etc.

9.3 Drawings and diagrams – fault-finding aid

See the section: *Documents and drawings.*

9.4 Required equipment for maintenance

Tools: screwdrivers, measurement tools, brush for cleaning, soap…

Replaceable resources:

- Plugs if defective
- Some spare parts of controller such as LCD screen, keypad…
- Fuse if defective
- Mechanical parts if defective such as handle, lock, curtains
- Lights if defective

Cleaning equipment:

- Part to check and clean if applicable:
  - o Condenser
  - o External sides except controller part
  - o Internal side except ceiling and machinery part

9.5 Energy control procedures

9.5.1 Isolation and locking

Danger of unexpected start

Dangerous situations can occur if the supply is switched on unexpectedly or unintentionally while people are working on the machine. This can cause serious injury or death.

Retainment of energy supply

If an overview of the entire machine and its plug cannot be maintained, during e.g. maintenance, the machine must be secured against unintentional restart by means of a locking device.

Supply isolation of individual machines

For further information on safe separation of energy sources, refer to the associated operating instructions for the respective machine.

See the section on: *Associated user documentation*

Before gaining access to the hazardous parts or areas of the machine for the purpose of repair or maintenance, the supply disconnecting device must be in the "OFF position and locked". If work is to be performed on the electrical parts, a deenergized state must be verified through measurement.

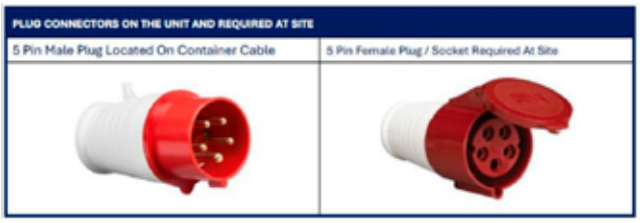
9.5.2 Safety with lockable CEE plug

9.5.2.1 LOTO procedure

Power supply divider connection (CEE plug) with a lockable function is most recommended for safety purpose.

- Electrical connection available on wire (approx. 18 m.) connected to the machine.

LOTO procedure - To prevent accidents! Ensure that this LockOut and TagOut device or similar type are available and ready to use to secure the service-operators under cleaning, service or maintenance.



Main Supply Separator

1. Locate the area where LOTO equipment is stored and take it when LOTO procedure is to be done.
2. Complete and fill the LOTO documentations.
3. When the freezer room is shut down, it will deactivate the control modules for both containers.

Safety:

Remember to wear safety goggles and ear protection when you are at the service area by at the end of the containers.

4. Turn Off the machinery by pressing OFF.
5. Once unit is completely stopped, open the controller box and switch OFF the circuit breaker.
6. Go to the power plug and pull it out.
7. The LOTO locking mechanism is placed on the plug to ensure that it cannot be connected by unauthorized persons.
8. Install the LOTO locking mechanism in the power plug on the small tab located on the outside of the plug.
9. Place the LOTO label on the padlock. Insert the padlock into the LOTO and lock it.
10. To reconnect power, follow the instructions in reverse order.

9.5.3 Isolation of energy supply

Before repair, maintenance, etc. is commenced, energy sources must be disconnected (locked) and possibly relieved/vented.

1. Bring the machine to a standstill by STOP and POWER-OFF the machinery.
2. Identify all devices/switches for isolation and restraint relevant to the work.
   - o Relevant devices/switches for isolation and restraint are the SHUT-OFF the Discharge service valve (refrigeration/compressor systems) and electrical switches that CUT-OFF the supplies to the TITAN Containers.
3. Disconnect the electrical supply to all electrical equipment via the supply disconnecting device/the main supply separator.
4. Protect the machine against unintentional restart using a locking device intended for the plug to the machinery shown above.

If needed, mount a sign signalling a prohibition against machine operation.

9.5.4 Restraint/Lock-off device for Refrigerator System

Before accessing the Refrigeration - pressurized system during maintenance or repair, the system must be isolated and offloaded in the pressuresystem.

The isolation device must be locked in "off-position" before maintenance is commenced.

9.5.4.1 Handle of the discharge Service Valve open/lock-off positions

See the section on: *Associated user documentation*

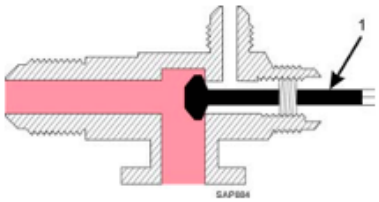
Note: *The valves are a permanently assembled unit and must be replaced in total if defective. The only maintenance possible on the discharge or suction service valve is to periodically tighten the packing nut or to replace the packing.*

⚠ WARNING

Hazard of Explosion!

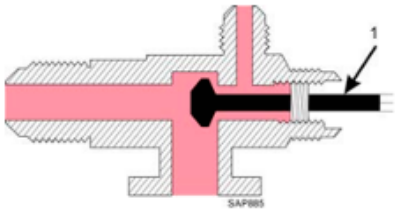
Do not start unit with discharge valve in front seated position.

Service Valve Back Seated (Operating Position)



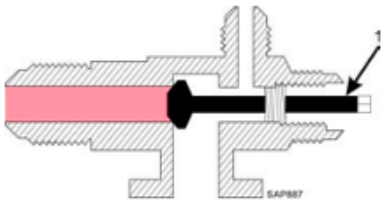
1	Full Counterclockwise

Service Valve Open to Port (Servicing Position)



1	1/2 Turn In

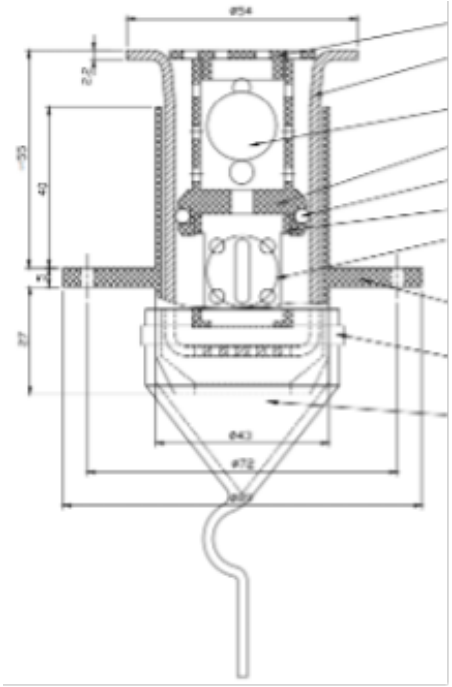
Service Valve Front Seated (Check or Remove Compressor)



1	Full Clockwise

9.5.4.2 Closure/safe-blocking procedure of Sewage/separation of drainpipe connection

Drains are located inside in for corners. Water can only go outside. *See Drain Drawing to the right.* It is possible to replace this part if defective.



9.5.5 De-loading of contained energy

Before accessing the pressurized system during maintenance or repair, any trapped or accumulated energy must be dissipated/deloaded. Verify that the pressurized systems are depressurized before maintenance is commenced.

See the section on: *Associated user documentation*

9.6 Procedures to restore operation

See the section on: *Associated user documentation*

9.7 Manufacturer maintenance operations

See the section on: *Associated user documentation*

9.8 Inspection, testing and maintenance of the machine and its accessories

See the section on: *Associated user documentation*

Maintenance

Warning!

- Risk of shock! Unintentional connection to ground may occur if electrical cables are damaged.
- In the event of damage to pressurized hoses, these may rupture and whip out towards machine operators resulting in personal injury.
- If the required energy supply is not available, operating errors may occur.

The following general precautions SHALL be considered before restoring operation:

- Electrical cables and their enclosure must be intact and undamaged.
- Pressure hoses for refrigeration/heating system must be intact and undamaged.
- Components carrying a voltage or pressure must be intact and undamaged
- The required energy supply must be present.

9.8.1 Attentions to maintenance of installations frequency

TITAN Containers ArcticStore contains 4 kg of coolant (R 452A/R404a) in the refrigerator system.

- Installations with refrigerants must have a check **at least every 12 months by certified personal**
- Personal must follow the yearly maintenance checklist provided by TITAN Containers.
  See the section: *Associated user documentation.*

Component/ machine part	Frequency	How (method)	Acceptance/ non-acceptance	Action	I/T/M I = Inspection T = Testing M = Measuring
Safety relevant inspection, testing and maintenance: All safety related inspections, testing and maintenance SHALL be included directly in the table, this do also apply to information from the indi-vidual original instruction's handbooks/equipment's manual, or specific data sheets. **See section:** *Specific Thermo King – Operator's Manual and documentation.*					
Person Trapped Alarm Button	Yearly	Activate the [**P.T. Alarm button**] while the machine is processing.	Shall be intact and operate as specified in Safety functions, overview **Flash beacon light** Check that the red alarm light lighting-up outside when activated the button. **Siren** Check that the siren turns-on loud when activated the button.	In the event of a failure or fault, the machine must be taken out of operation until the fault has been rectified, after which the function must be tested again.	I/T
Pause Button	Yearly	Activate the [**Pause Button**] located inside container while the machine is running.	Shall be intact and operate as specified in Safety functions, overview **Ventilator** Check that that the cool air -ventilation will stop. But be aware it will start-up automatically again, after 15 min.	In the event of a failure or fault, the machine must be taken out of operation until the fault has been rectified, after which the function must be tested again.	I/T
Lighting.	Yearly	**Visual inspection:** 1. Open the door while the machine is running, this will activate the sensor and turn-on the light, until the door closes again. 2. If trapped inside the light can be turned on by pressing the light button.	General lighting SHALL be intact - Flicker-free and non-glare general lighting in the storage. Light SHALL be min. 150 lux when doors opening.	Replaced with new equally adequate components in case of failure.	I/T
Supplementary protective bonding.	Yearly	Inspect the protective bonding in its entirety and at termination points. Measure continuity.	Measurement SHALL not deviate significantly from the recorded continuity at machine commissioning. See appendix.	Optimal protective bonding must be re-established before continuing machine operation.	I/M
Safety symbols, signs and pictograms.	Yearly	Inspect machine symbol according to their location specified in *Location of safety symbols and/ or pictograms on the machine.*	Symbols SHALL be visible, legible and undamaged.	Symbols must be replaced in the event of missing, damaged or illegible markings.	I

Electrical: General inspection, testing and maintenance

Component/ machine part	Frequency	How (method)	Acceptance/ non-acceptance	Action	I/T/M I = Inspection T = Testing M = Measuring
Cables, plugs and electrical enclosures etc.	Yearly	Visual inspection of wires and enclosures.	Damaged insulation/ enclosures for electrical equipment. Damage to an electrical cable or plugs.	Insulation must be restored or completely replaced while in de-energized condition. Make sure to attach the cables after maintenance. Must be updated/ corrected with new.	I/T
Isolating device/the main supplier of supply	Yearly	Check that the device can be locked in its OFF-position, and that it can isolate the energy supply. The machine must not be able start while the energy supply is isolated.	The isolating device SHALL be lockable and capable of isolating the machine by disconnecting the energy supply.	In the event of a failure or fault, the machine SHALL be taken out of operation until the fault has been rectified, after which the function must be tested again.	I/T
Electrical marking	Yearly	Visual inspection.	Missing, damaged or illegible marking.	Marking must be replaced/restored in accordance with electrical documentation.	I
Light and mantrap switches	Yearly	Control switches are working.	While running, make some tests.	In case of failure, proceed to replace part.	I/T

Refrigeration System: General inspection, testing and maintenance

Component/ machine part	Frequency	How (method)	Acceptance/ non-acceptance	Action	I/T/M I = Inspection T = Testing M = Measuring
Hoses, pipes, fittings and couplings, valves compressor connection	Yearly	Visual inspection	Signs of: • Wear • Leaks • Refrigeration-system leakage Expired date	Replaced with new equally adequate components.	I/T
"Pressure transmitter/relief valve/system (High-pressure system)"	At least one time per year TITAN Shall indicate a specific frequency - if not calendar time, then in service time according to operating hours – counter. Level: (PL d) in according to EN ISO 13849-1.	Verify safety function at its adjusted pressure. Check by enabling the emergency stop. Assess for specific machine.	Pressure needs to trigger at 32,4 bar Normal work pressures are adjustable in range in between 3-30 bar.	Replaced with new equally adequate components The compressor must go back to standby mode. The fan must continue to operate in case of overheating.	I/T/M
Pressure transmitter/relief valve/system (Low-pressure system)	At least one time per year TITAN Shall indicate a specific frequency - if not calendar time, then in service time according to operating hours – counter. Level: (PL d) in according to EN ISO 13849-1.	Verify safety function at its adjusted pressure. Check by enabling the emergency stop. Assess for specific machine.	Pressure needs to trigger at -0.17 to -0.37 bar	Replaced with new equally adequate components. The compressor must go back to standby mode. The fan must continue to operate in case of overheating.	I/T/M
Fasteners	Assess for the specific machine.	Visual inspection	Lack of fasteners.	Defective, loose or missing fasteners are replaced, or tighten.	I
Leakage test	Yearly	Test if any leakage	Control with measurement tool.	In case of leakage, proceed to repair and refill refrigerant.	I/M

Mechanical: General inspection, testing and maintenance

Component/ machine part	Frequency	How (method)	Acceptance/ non-acceptance	Action	I/T/M I = Inspection T = Testing M = Measuring
Fixed guards	Yearly	Visual inspection Check that the guard is securely fastened when the machine is at a complete stand-still and isolated.	Missing/defective/ deformed guards or fasteners. Make sure that the guard has not been modified, and it is located as intended by the manu-facturer.	Guarding must be restored e.g. by fixing or replacing.	I
Moveable guards	Yearly	Visual inspection Check that the guard is securely fastened when the machine is at a complete stand-still and isolated. Inspect and test the function and move-ment of the guard.	Missing/defective/ deformed guards or fasteners. Make sure that the guard has not been modified, and it is located as in-tended. Lack retaining means (e.g. hinge) cannot open.	Moveable guard and possibly associated loose parts are replaced, with components with the same properties.	I/T
Escape Hatch/ Emergency door	Yearly	Visual inspection Check that the guard is securely fastened. Inspect and test the handle and lock's function. that it unhindered can be opened for a person to escape.	Missing/defective/ deformed guards or fasteners. Make sure that the emergency door has not been modified, and it is located as intended. • Lack retaining means (e.g. hinge) • Cannot open.	Moveable guard and possibly associated loose parts are replaced, with components with the same properties.	I/T
Door-locks, Lifting eyes bracket or suspension	Yearly	Visual inspection	Loose or missing fasten-ers. Assess acceptance criteria for the specific machine.	Defects are repaired or re-placed.	I
Internal curtains	Yearly	Visual inspection	Loose or missing fasten-ers. Assess acceptance criteria for the specific equipment.	Defects are repaired or re-placed.	I
Ramp connection	Yearly	Visual inspection	Loose or missing fasten-ers. Assess acceptance criteria for the specific equipment.	Defects are repaired or re-placed.	I
Safety-chains for security the door open.	Yearly	Visual inspection	Loose or broken/miss-ing link in the chain -or fasteners.	Defects are e repaired or re-placed.	

Component/ machine part	Frequency	How (method)	Acceptance/ non-acceptance	Action	I/T/M I = Inspection T = Testing M = Measuring
Welds	Yearly	Visual examination Fractures or signs of cracks.	• Fractures or signs of cracks.	Defective welds are removed and re-welded Possible rust removal	I
Screws and bolts	Yearly	Visual check-up, and retightening.	• Missing/damaged screws/bolts. • Loose screws/bolts.	• Replaced in case of shortage or need • Firmly tighten all mounting bolts.	I/T

- Inspect the wiringconnections for defects and always are in good shape and conditions
  - o Please contact TITAN Containers nearest office (or local HQ)
  - o Do not use extension cords without prior approval from TITAN
- Inspect in general the guards for defects, including deformation, missing fasteners, etc.
- Defective light bulbs or fluorescent tubes must always be replaced

Performed inspections, testing and maintenance must be noted (e.g. in a log). The document must be easily accessible and located in a place known to all users of the machine.

9.9 Spare parts

When replacing components, carriers and equipment, etc. these must have at least the same strength/loadbearing capacity as the original.

The instructions for use shall contain means of identifying spare parts and shall also specify the specifications for spare parts which affect the safety of the machinery.

Spare parts can be identified by. TAG number or expansion drawing for the machine/plant.

9.9.1 Spare parts list

See the section: *Associated user documentation.*

10 Cleaning and sanitizing

10.1 Required equipment and procedures

10.1.1 Tools, equipment and cleaning agents

Tools: water, brush, compressed air, sponge.

10.1.2 Personal protective equipment

Depending on the cleaning task, the following personal protective equipment must be used:

See section: *Personal protective equipment*

10.1.2.1 Applied cleaning agents

Cleaning agents: Protective equipment

Use all protective equipment described in the safety data sheet for the given cleaning agent.
Personal protective equipment shall be used in accordance with the individual product data sheets/safety data sheets during:

- General cleaning.

10.1.2.2 Properties of cleaning agents inside the TITAN Containers (Storeroom)

Features (general cleaning):

- Internal side except ceiling and machinery part.
- External side except controller or electrical part.
- Condenser part must be washed carefully to not damage the fins.
- Approved for the food industry.
- Washable with ordinary tap water and must not leave residue on the surface.

Features (cleaning of metal):

- Must not leave a residue.
- After metallic cleaning, surfaces may need to be rinsed with water afterwards.

10.1.3 Energy isolation

In general, to protect personal before cleaning or servicing the container unit. The supply power needs to be disconnected and turned into safe mode.

- The supply power needs to be disconnected, and the energy needs to be isolated with a lockable supply divider.

Isolation of energy supply

The supply disconnection device must be locked in its "OFF" position before cleaning/servicing is commenced. (Use a lockable supply divider).

See the section: *Isolation and locking.*

10.1.4 Cleaning procedures, recommended

During cleaning and normal machine use:

- Keep the area around the machine free of junk and items.
- The floor inside the storeroom must be kept clean of items and fluid spillage before starting the refrigeration system. The floors may still be slippery and therefore proper footwear is needed when access the container.
- In the event of a sudden liquid spill, identify

and remove liquids immediately.
- Ensure to protect all electronics, buttons, and safety components.

Component/ machine part:	Cleaning frequency	Procedure:
TITAN Containers, surfaces	Yearly	Clean side with pressurized water on sides, roof, door. Avoid machinery. Inside only low pressured water floor, sides avoid ceiling and machinery.
Cooling unit/ system rear end of container	Yearly or as required	During Yearly maintenance, avoid controller box.
Plastic curtains and muting sensors	Yearly or as required	During Yearly maintenance.

10.1.4.1 Cleaning of TITAN Containers (inside cold store/room, or after service and repairs)

Danger of splash back when cleaning
During cleaning, there is a risk of splash back. It can cause serious eye damage.

During cleaning of inside containers there is a risk of the cleaning agent and any remains in the container surfaces may splash back at the cleaning personnel.

The following personal protective equipment must be used during cleaning of TITAN Containers:

Eye protection
Wear eye protection during cleaning of doorway, sliding strip curtains, and inside cold store/room of the TITAN Containers.

Face shield
Wear a face shield during cleaning work with high-pressure equipment.

10.1.5 Restoring operation

When restoring operation, follow normal start-up procedure.

See section: *Procedures – Starting.*

11 Troubleshooting and repair

Fault finding and repair of individual machines
Information on fault finding and repair are specified in the associated operating instructions of the individual machines.

See the section: *Associated user documentation (alarm/warning).*

Error messages, indications known by the machine are listed below along with the required action.
In the event of an unexpected or unknown fault, TITAN Containers must be contacted and informed of the fault given.

Local contact can be found at: *www.TITANContainers.com*

11.1 Repair point and fault identification

Known faults are displayed by the machine's controls.
Before beginning to repair the machines, it must be brought into a safe condition.

Isolation of energy supply
The supply disconnecting device must be locked in its [OFF] position before repairing is commenced.

See the section: *Isolation and locking.*

11.2 Troubleshooting

11.2.1 General fault identification

When irregularities are detected during operation of the machine, an investigation must be carried out as soon as possible. By rapid intervention and correction of the irregularities, a dangerous situation may be prevented, as well as avoiding unnecessary wear and strain on the machine.
In the event of a malfunction or operation due to an unknown fault, an overall inspection of the machine is performed.

11.2.2 Error indications / Error messages

Fault message/ Error indication	Fault	Possible cause or procedure for detecting fault	Solution	Performed by
No light or power to the machine	1. Blown fuse 2. Tripping of RCD 3. Power supply 4. Plugs not con-nected 5. Pause button	1. Check fuse 2. Check RCD 3. Check main power supply 4. Check plugs are connected 5. Check pause button is not switched on	Change/reconnect fuses. Reconnect RCD Supply power Connect plugs Unlock pause button	All users /electrician Persistent fault à contact maintenance personnel or TITAN Containers
Vibrations or annoying noise.	1. The machine is tilted. 2. Fasteners for the foundation/ consoles have come loose. 3. The machine bumps up against building parts or other ma-chines.	Examine the machine's contact with the foun-dation/consoles and contact with surround-ing elements.	Bring the machine level with the surface. Tighten or replace fas-teners.	Maintenance person-nel or contact TITAN Containers
No machine/ fans movement	1. Engine failure 2. Power failure	1. Setup control 2. Check power supply	Reconnect the dis-con-nected fuses and/or re-lays. Replace defective components.	Maintenance person-nel or contact TITAN Containers
Machinery not performing	1. Lack of refrig-erant	1. Leak	1. Check leak point and repair and refill	Technician or contact TITAN Containers
Icing issue	1. Ice formation	1. Door open	1. Defrost by using de-frost manual function or set T° at high T°, and educate users to close door	Personnel / User
Pause button not working	1. Broken 2. Defective	1. Damage by user 2. Electric wires not connected	1. Replace the pause button 2. Request electri-cian to check wires	Maintenance person-nel Electrician or contact TITAN Con-tainers
Signs missing	1. Removed 2. scratched	1. Intentionally re-moved 2. During han-dling/ transportation	1. Replace decals again	Maintenance person-nel or contact TITAN Con-tainers

12 Dismantling, disabling and scrapping

Dismantling, disabling and scrapping of individual machines
The manufacturer's instructions for dismantling, disabling and scrapping of each individual machine must be complied with as specified in the associated operating instructions.

See the section: *Associated user documentation.*

Proper equipment and area are required to scrap the container by a certified company as it contains aluminium, stainless steel, P.U foams, electric wires…

12.1 Preventive measures

See the section Associated user documentation.

12.1.1 Technical

The F-gas needs to be removed by a certified technicians and disposed by a certified company.
Any other hazardous components need to be removed and disposed by certified company.

See section: *Associated user documentation*

12.1.2 Organizational

See the section: *Associated user documentation.*

12.2 Energy isolation

Isolation of energy supply
The supply disconnection device must be locked in its "OFF" position and the machine disconnected from the energy sources before dismantling is commenced.
See the section: *Isolation and locking.*

12.3 Special tools and equipment

12.4 Special risk reduction measures

The machine is dismantled, sorted and disposed of in categories as required by applicable environmental requirements at the time of scrapping.
The product is subject to Directive 2012/19/EU on waste electrical and electronic equipment (WEEE).

The product must not be disposed of with unsorted household waste. Use local WEEE collection points for disposal of this product and ensure compliance with all applicable regulations.

12.5 Personal protective equipment

The following equipment must be used during dismantling, disabling and scrapping of the machine.
See section: *Personal protective equipment*

12.6 Sequence or chronology for decommissioning

The owner must take precautions to limit the amount of waste, especially with the use of environmentally friendly technology and products that can be recovered and recycled.
All parts of the machine that have been in contact with chemicals must be cleaned before scrapping.

12.7 Disassembly

Before disassembling the machine, a plan for disassembly must be prepared. The plan must include a risk assessment for the work, as well as for the disposal of machines and machine parts according to the local regulations.

The risk assessment must include the following aspects:

- Disconnection of energy sources.
- Hidden dangers (e.g. potential energy charges).
- Sequence of disassembly.
- Suitable means (brace, lift/crane/truck).
- Sorting of machine parts.
- Proper disposal/recycling.

The plan and risk assessment must be prepared in accordance with current rules at the time of dismantling.

If the switchboards contain frequency converters, work must be started at the earliest after the specified time, for the dangerous residual voltage of the frequency converter to disappear, has passed after the interruption of the supply.

Prior to disassembly, a deenergized state must be verified, using appropriate measuring equipment.

Potential energy, such as the pressure in cooling systems and the electric power supply, must be relieved/lightened before separation begins. When disassembling, the specified lifting and hooking points of the machine must be used.

See the section: *Transportation, handling and storage.*

12.8 Disposal, destruction and recycling

It is the owner's responsibility to ensure that waste is disposed of and recycled properly according to the local regulations.
When disposing of the materials, a careful sorting must be done:

- Materials: Machine frame and all mechanical plant and machine components consist of steel, light metal and plastic. These materials must be returned for recycling. This also applies to non-metals, composite materials and consumables.
- Problematic substances are found in parts and components such as batteries, accumulators, cables, electronic waste and printed circuit boards. These items must be handed in at places that accept this type of waste.
- Drainage of liquids: e.g. refrigerants, oils and greases must also be handed in at sites that accept this type of waste.

When disposing of waste and used parts, always comply with applicable national and regional health, safety and environmental regulations.

Copy of EC-/EU-DECLARATION OF CONFORMITY

EC-/EU-DECLARATION OF CONFORMITY

Machinery Directive 2006/42/EC annex II A

1. Business name and full address of the manufacturer (Combine container with Thermo Kings cooler unit):
   Yangzhou Tonglee Reefer
   Add.: 2333# Pang Jin Road, Economic Development Zone, Wujiang. Suzhou. Jiangsu, China 215200
2. Name and address of the representative/importer person authorized to compile the technical file, who must be established in the Community:
   TITAN CONTAINERS A/S
   Litauen Alle 9 · DK 2630 Taastrup
3. Description and identification of the machinery, including generic denomination function, model, type and commercial name:
   Machine name: **ArcticStore with Thermo King Magnum Plus 4000**
   Function: Storage of items requiring temperature control (e.g., food, pharma, technology, testing's, etc.) Supplied with cooling media: R-452A.

Product	Type	Size	Serial No. /Prefix	Commercial Name
Cold storage Reefer container with machine	Reefer	10' 20' 40'	TITU/TCIU	ArcticStore

4. The machine fulfils all the relevant provisions of:
   Directive 2006/42/EC of the European Parliament and of the council of 17 May 2006 on machinery.

   Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to electromagnetic compatibility.
5. Harmonized standards used:
   EN 378-2:2016
   Refrigerating systems and heat pumps – Safety and environmental requirements – Part 2: Design, construction, testing, marking and documentation.

   EN 61000-6-2:2005
   Electromagnetic compatibility (EMC) - Part 6-2: Generic standards – Immunity standard for industrial environments.

   EN 61000-6-4:2007
   Electromagnetic compatibility (EMC) - Part 6-4: Generic standards – Emissions Standard for industrial environments.
6. The place and date of the declaration:
   China / Yangzhou / **December 31. 2023.**
7. The identity and signature of the person empowered to draw up the declaration on behalf of the manufacturer:

City: Taastrup
Date: 2024-03-08

Authorisation signature

(Name and position in block letters)

Documents and drawings

12.9 Electric documentation

See the section: *Associated user documentation.*

12.10 Mechanical documentation

See the section: *Associated user documentation.*

12.11 Parts list

See the section: *Associated user documentation.*

13 Appendices

13.1 Local first aid guidelines

Please contact your local first aid: emergency phone number in your local country.

13.2 Material Data Safety Sheets (chemicals, cleaning agents, etc.)

See the section: *Associated user documentation.*

13.3 Detailed technical specifications

See the section: *Associated user documentation.*

13.4 List of spare parts

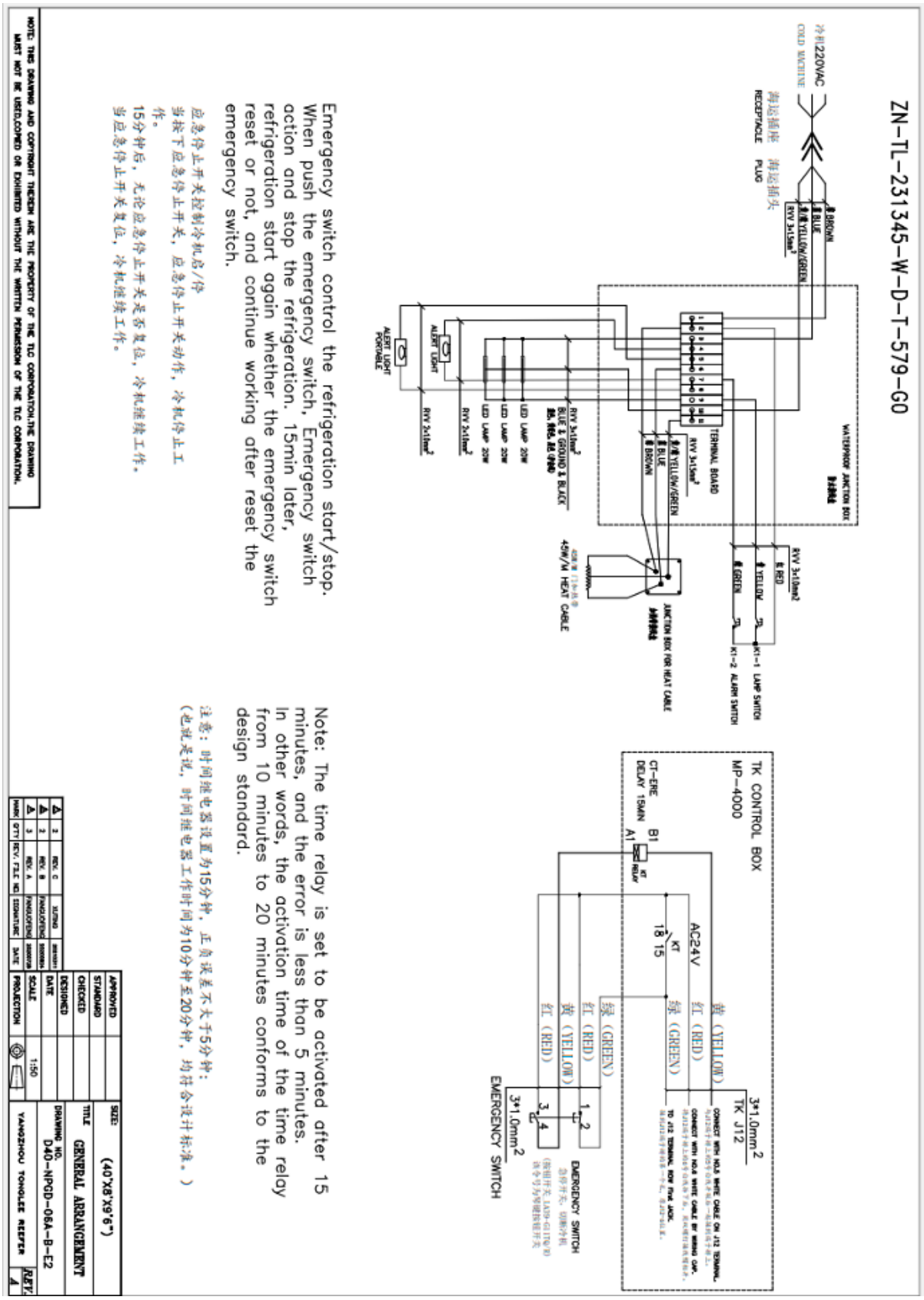
13.5 Marking assemblies, drawings

See the section: *Associated user documentation.*

- Location - Marking Assembly no.: D40-NPMA-26G-1(1/2)
- Specific types of Marking Assembly no.: D40-NPMA-26J-1(1/2)
- Lashing Rings only for Ramp no.: D40-NPMA-26G-3
- Nameplate, CE marking, **see actual section:** *Nameplate*

13.6 Electrical Diagram

Electrical Diagram – General Arrangement.: D40-NPGD-06A-B-E1
Electrical Diagram – General Arrangement.: D40-NPGD-06A-B-E2



Emergency switch control the refrigeration start/stop. When push the emergency switch, Emergency switch action and stop the refrigeration. 15min later, refrigeration start again whether the emergency switch reset or not, and continue working after reset the emergency switch.

应急停止开关控制冷机启/停
当按下应急停止开关，应急停止开关动作，冷机停止工作。
15分钟后，无论应急停止开关是否复位，冷机继续工作。
当应急停止开关复位，冷机继续工作。

Note: The time relay is set to be activated after 15 minutes, and the error is less than 5 minutes. In other words, the activation time of the time relay from 10 minutes to 20 minutes conforms to the design standard.

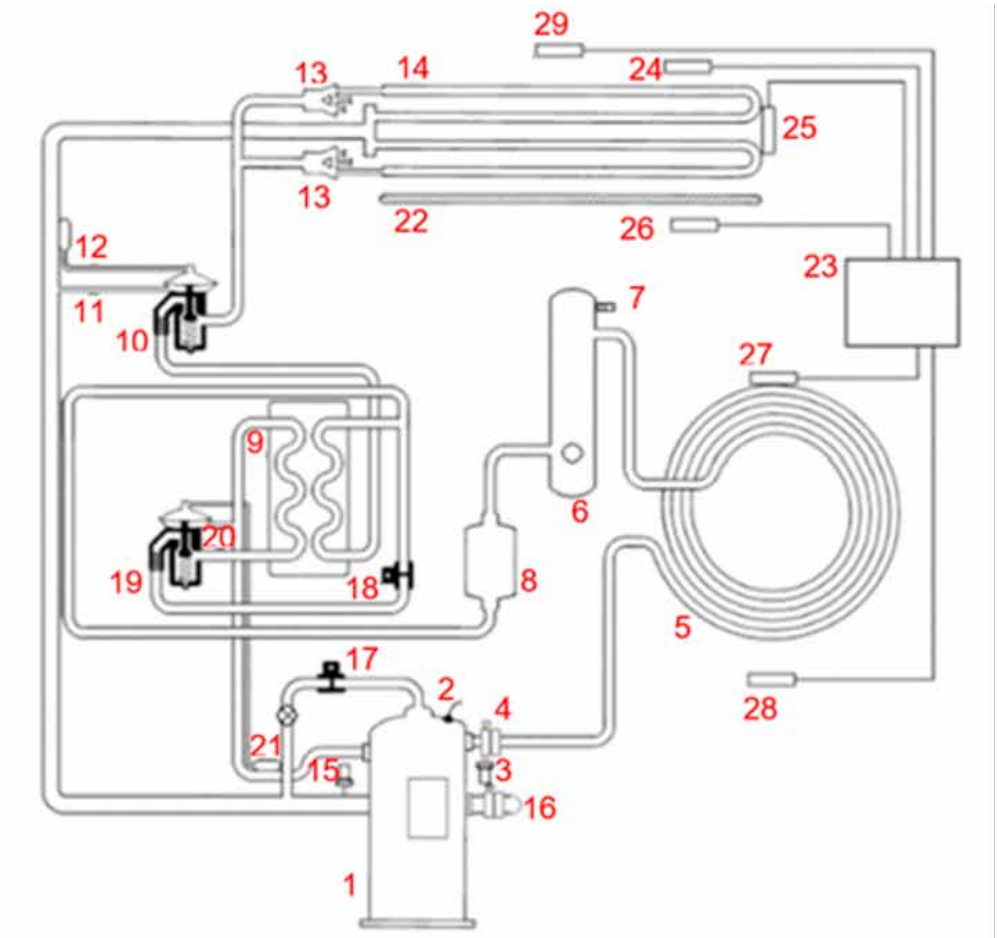
注意：时间继电器设置为15分钟，正负误差不大于5分钟；
（也就是说，时间继电器工作时间为10分钟至20分钟，均符合设计标准。）

MARK	QTY	REV. FILE NO.	SIGNATURE	DATE	APPROVED	
					STANDARD	
					CHECKED	
					DESIGNED	
					DATE	
					SCALE	1:50
					PROJECTION	

SIZE: (40'X8'X9'6")
TITLE: GENERAL ARRANGEMENT
DRAWING NO. D40-NPGD-06A-B-E2
YANGZHOU TONGLEE REEFER
REF: A

13.7 Refrigeration system

Refrigeration Flow diagram:



1. Scroll Compressor
2. Discharge Temperature Sensor
3. High Pressure Cut-Out HPCO
4. Discharge Service Port
5. Condenser Coil
6. Receiver Tank
7. Fusible Plug
8. Filter Drier
9. Economizer Heat Exchanger
10. Expansion Valve
11. TXV Equalizer Line
12. TXV Feeler Bulb
13. Evaporator Distributors
14. Evaporator Coil
15. Low Pressure Cut-Out LPCO
16. Suction Service Port
17. Digital Control Valve with Service Valve
18. Economizer Valve
19. Economizer TXV
20. Economizer TXV Equalizer Line
21. Economizer TXV Feeler Bulb
22. Electric Heaters
23. MP3000 Microprocessor
24. Return Air Sensor
25. Evaporator Coil Sensor
26. Supply Air Sensor
27. Condenser Coil Sensor
28. Ambient Air Sensor
29. Humidity Sensor

13.8 Certificates and other declarations

See the section: *Associated user documentation.*

13.9 Components supplier instruction handbooks

See section: *Specific Thermo King – Operator's Manual and documentation.*

TITAN CONTAINERS WORLDWIDE

European offices

TITAN Austria
TITANcontainers.at

TITAN Belgium
TITANcontainers.be

TITAN Croatia
TITANcontainers.com/hr

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TITANcontainers.cz

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Original Instruction Handbook

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