Installation, Operation, and Maintenance

Trane Rental Services

Cold Storage Container

Models:
Thermoking
Magnum+/Superfreezer — CFF

⚠ SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

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Overview

This catalog should be only be used as a reference for Trane Rental Services cold storage containers to determine size limitations, available power, or lifting requirements. Verify the following with Trane Rental Services:

- Dimensions/weights and control options for the specific rental unit before equipment is shipped to a job site.
- Confirm adequate power is available for each cold storage container.
- If additional information is required, reference the Thermoking installation manual.

Contact Trane Rental Services 24/7 for availability of all equipment (including: flex duct, electrical cable, transformers, etc.) prior to obtaining a purchase order from the customer. Equipment is available on a first come, first-served basis, and can be reserved for three days with a signed Rental Agreement.

Model Number Description

Digit 1, 2, — Unit Model

RS = Rental Services

Digit 3, 4 — Unit Type

RC = Refrigerated Container

Digit 5, 6 — Door Configuration

00 = Dock Door
10 = Butcher Door

Digit 7, 8 — Container Length

20 = 20 foot container

Digit 9, 10— Design Sequence

F0 = Magnum Plus
F1 = SuperFreezer
F2 = Container Fresh and Frozen

Digit 11, 12— Incremental Designator

AA

General Data

RSRC1020F0

Table 1. General data - RSRC1020F0

Net Cooling Capacity[a]	12,636 BTU/hr
Net Defrost Heating Capacity[b]	17,914 BTU/hr
Refrigerant Type	R-404A
Number of Compressors	1
Compressor Type	Scroll
Refrigerant Charge	8 pounds
Number of Refrigerant Circuits	1
Ambient Operating Conditions	(-22)°F — 122°F

[a] Design Conditions: 100°F Ambient, -40°F Evap. Return Air Temperature
[b] Design Conditions: Includes fan heat

RSRC1020F1

Table 2. General data - RSRC1020F1

Net Cooling Capacity[a]	28,150 BTU/hr
Net Defrost Heating Capacity[b]	17,914 BTU/hr
Refrigerant Type	R-134a/R-23
Number of Compressors	2
Compressor Type	Semi-hermetic reciprocating (R-134a) / Hermetic scroll (R-23)
Refrigerant Charge	7.7 pounds (R-134a) / 7.05 pounds (R-23)
Number of Refrigerant Circuits	2
Ambient Operating Conditions	(-22)°F — 122°F

[a] Design Conditions: 100°F Ambient, -94°F Evap. Return Air Temperature
[b] Design Conditions: Includes fan heat

RSRC1020F2

Table 3. General data - RSRC1020F2

Net Cooling Capacity[a]	12,636 BTU/hr
Net Defrost Heating Capacity[b]	17,914 BTU/hr
Refrigerant Type	R-134a
Number of Compressors	1
Compressor Type	Scroll
Refrigerant Charge	11.4 pounds
Number of Refrigerant Circuits	1
Ambient Operating Conditions	(-22)°F — 122°F

[a] Design Conditions: 100°F Ambient, -40°F Evap. Return Air Temperature
[b] Design Conditions: Includes fan heat

Gross Cooling Capacities

RSRC1020F0

Table 4. Gross cooling capacities — RSRC1020F0

Evaporator Return Air Temperature	Power Requirement (Watts)	BTU/hr
70°F	11,500	56,700
35°F	11,000	40,945
0°F	7,500	24,785
(-20°F)	6,600	17,251
(–31°F)	6,000	14,000

Note: Net Cooling Capacity at 100°F Ambient Temperature at 60 Hz Power

RSRC1020F1

Table 5. Gross cooling capacities — RSRC1020F1

Evaporator Return Air Temperature	Power Requirement (Watts)	Power Factor	BTU/hr
(-22°F)	8,250	0.84	28,150
(–76°F)	5,850	0.81	19,961
(-85°F)	4,876	0.73	16,637
(-94°F)	3,744	0.70	12,775

Note: Net Cooling Capacity at 100°F Ambient Temperature at 60 Hz Power

RSRC1020F2

Table 6. Gross cooling capacities — RSRC1020F2

Evaporator Return Air Temperature	Power Requirement (Watts)	BTU/hr
70°F	10,650	53,618
35°F	8,800	38,847
0°F	5,690	21,345
(-20°F)	4,570	13,780

Note: Net Cooling Capacity at 100°F Ambient Temperature at 60 Hz Power

Electrical Data

RSRC1020F0

Table 7. Electrical data — RSRC1020F0

Number of Electrical Circutis	1
Voltage	460 V 3–phase
Frequency	60 Hz
MCA	18.1 A
MOP	25 A
FLA	15.3 A

RSRC1020F1

Table 8. Electrical data — RSRC1020F1

Number of Electrical Circutis	1
Voltage	460 V 3–phase
Frequency	60 Hz
MCA	37.3 A
MOP	50 A
FLA	33.2 A

RSRC1020F2

Table 9. Electrical data — RSRC1020F2

Number of Electrical Circutis	1
Voltage	460 V 3–phase
Frequency	60 Hz
MCA	17.9 A
MOP	25 A
FLA	15.2 A

Dimensions and Weights

All Container Types

Table 10. External dimensions

Length	19 feet 11 inches
Width	8 feet
Height	8 feet 6 inches

Table 11. Internal dimensions

Length	17 feet 3 inches
Width	6 feet 8 inches
Height	6 feet 11.5 inches

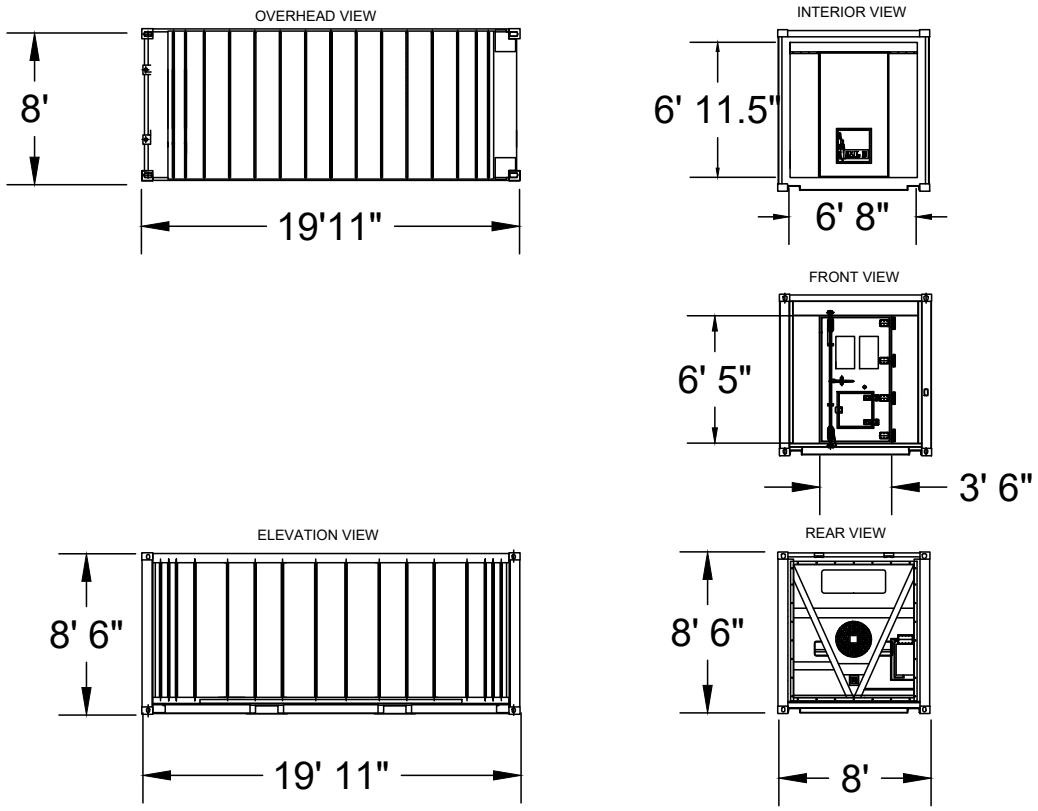
Table 12. Opening dimensions

Width	3 feet 6 inches
Height	6 feet 5 inches

Table 13. Weight

Empty Weight	9,260 pounds
Cargo Capacity	43,650 pounds

Figure 1. Container dimensions



Installation Considerations

Temperature Setpoint Range

- RSRC1020F0 (Magnum Plus) cold storage containers can maintain a temperature range of -40°F to 86°F with a maximum air temperature fluctuation of +/- 0.45°F (chilled mode) or +/- 1.8°F (frozen mode).
- RSRC1020F1 (Super Freezer) cold storage containers can maintain a temperature range of -94°F to 14°F with a maximum air temperature fluctuation of +/-1.8°F.
- RSRC1020F2 (Container Fresh and Frozen) cold storage containers can maintain a temperature range of -22°F to 86°F with a maximum air temperature fluctuation of +/- 0.45°F (chilled mode) or +/- 1.8°F (frozen mode).

Product Types

- RSRC1020F0 (Magnum Plus) and RSRC1020F2 (Container Fresh and Frozen) cold storage containers are ideal for above freezing storage applications and deep freeze storage applications requiring tight temperature control. Products used in these applications include temporary storage of food and beverages, industrial products, pharmaceuticals, and extra capacity for hospital environments.
- RSRC1020F1 (Super Freezer) cold storage containers allow for ultra-low temperature storage applications. Extreme low temperatures cause microbial decomposition to cease completely, ensuring that products remain in perfect condition over extended periods. Products used in these applications include vaccines, active pharmaceutical ingredients, biological material, blood plasma, food ingredients such as yogurt cultures, chemical enzymes, 3D printing components, high-tech semiconductor components, R&D material, processed and freshly caught seafood, and pre-treated composite materials.

Required Clearance

Units should be installed on a level surface with at least four feet of clearance in front of the refrigeration unit to ensure adequate airflow and service clearance.

Electrical Connections

All refrigerated containers are equipped with 50 foot power cables terminated with four-pin Leviton IEC pin and sleeve connectors. The units are provided with a 7 foot Leviton IEC adapter cable with bare wire connections for termination at appropriately sized disconnect or overcurrent device. Refer to unit-specific information in the following pages for electrical sizing and requirements.

Containers include a phase fault indicator light located next to the operator interface which illuminates to indicate phase reversal.

⚠ WARNING

Conform to All Applicable National, State, and Local Electrical Codes!

Failure to follow all applicable codes could result in an arc flash event, electrocution, explosion, or fire, which could result in death or serious injury.

Users MUST conform to all applicable national, state, and local electrical codes during the electrical installation and servicing of this product.

Container Features

All containers include a user-operable controls with the following functionality:

- Alarm switch with flashing alarm beacon to alert of safety issues
- Light switch to illuminate the interior of the container
- Pause switch to disable refrigeration unit for a predefined period of 8 minutes

Additionally all RSRC1020F1/RSRC1020F2 units include a door open indicator light and door heater switch to assist in opening the container door while operating at low temperatures. On units so equipped, the alarm switch provides the additional function of disabling the refrigeration unit when engaged.

⚠ WARNING

Check of Safety Devices Required!

Failure to follow instructions below could cause unsafe conditions and result in death, serious injury, or property damage.
All safety controls MUST be checked before starting the unit and during regular maintenance!
Check and test the operational functions of all safety devices supplied with this unit.

In order to prevent accidental containment of personnel within the container, each container door includes a door hatch which can be opened from within the container in order to access the main door latch for egress from the container.

Container Ramps

To assist with loading/unloading material to and from the container, ramps are provided with all containers.

Figure 2. Ramps included with all containers

Container Loading

Container interiors are labeled with a maximum cargo height in order to maintain adequate clearance for cooling airflow throughout the container; do not stack cargo above this height.

Additional Considerations

For additional information and specific unit considerations, contact Trane Rental Services.

Lifting and Rigging Instructions

See table below for typical unit lifting weights.

Table 14. Unit weights

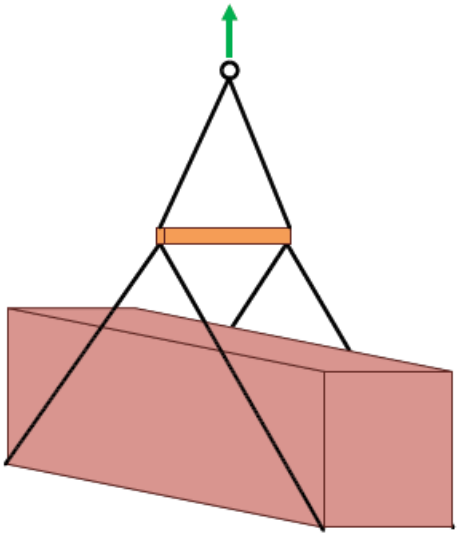
Empty Weight	Cargo Capacity
9260 pounds	43650 pounds

Lifting with a side loading forklift or standard forklift is acceptable. Lift and position the container using the fork pockets integrated into the sides of the container. There are not fork pockets on the ends of the container, therefore it is not allowed to lift the container from the ends. Ensure that the forklift is capable of lifting the combined weight of the container and cargo held within.

Figure 3. Forklift lifting method

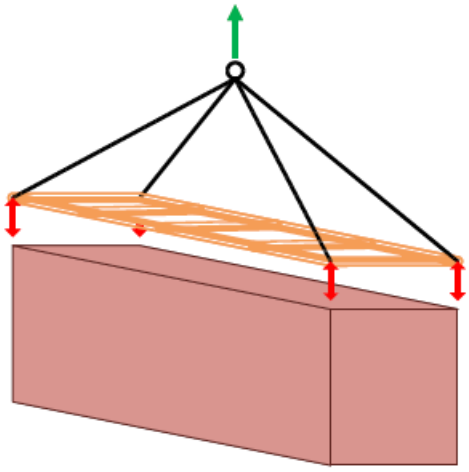
Lifting with a crossbar and lifting cables is acceptable. The cables **MUST** attach to the bottom lifting points on the container. Lifting beam crossbars **MUST** be positioned so lifting cables do not contact the sides of the unit. See figure below for an example of this lifting method.

Figure 4. Crossbar and cable lifting method



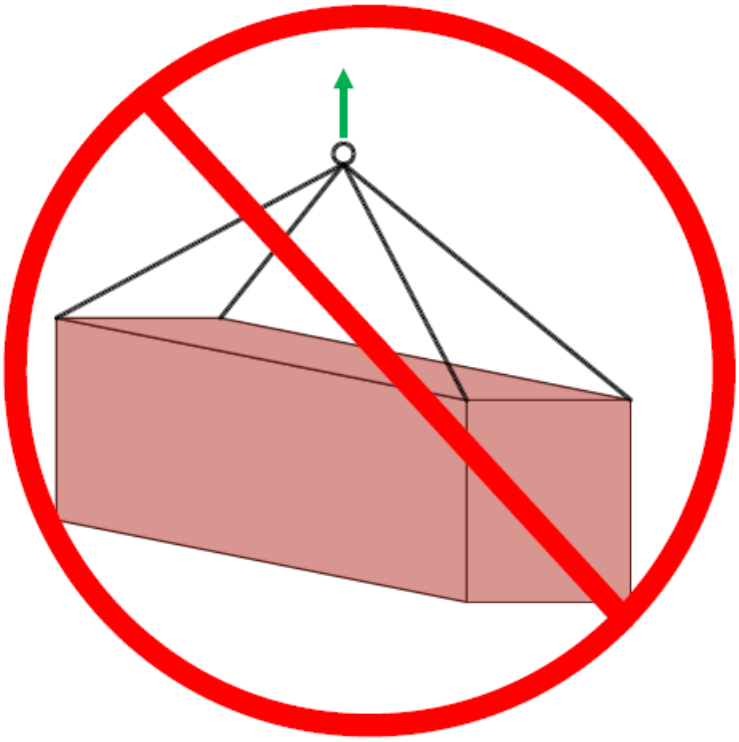
If lifting with a crane, using a container spreader is preferred. Attach chains or cables to lifting points on the top of the container as shown in the figure below.

Figure 5. Container spreader lifting method (preferred)



It is **NOT** permitted to lift a container using just a 4-leg sling attached to the four top lifting points. Doing so induces compression loads in the roof plane of the container, especially lengthwise, which could result in the instant breaking of the container. See the figure below for an example of this unacceptable lifting method.

Figure 6. Unacceptable 4–legged sling lifting method

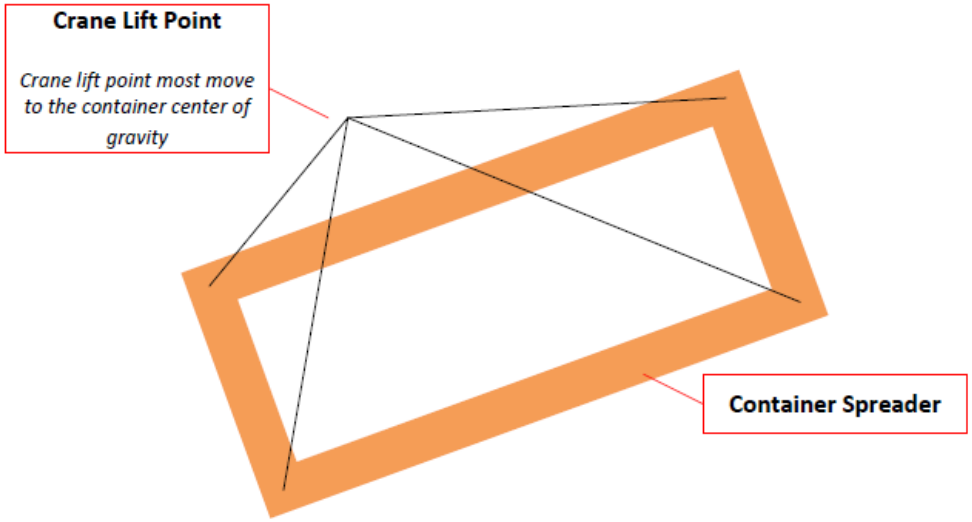


Important: *The center of gravity (CG) is never at the midpoint of the container base lifting points. A level unit lift is required for a safe lift and to prevent unit and cargo damage.*

Lifting a unit with equal length cables will **NOT** produce a level unit during the lift because the CG will not be at the midpoint between the base lifting holes. The following adjustments must be made to produce a level lift:

- Container Spreader Lifting Method
  - If the cables from the spreader bar to the container roof are the same length, the crane lifting point on the center web of the container spreader must be adjusted to produce a level lift. See Figure 5 for illustration.
- Crossbar and Cable Lifting Method
  - Several adjustments of the cable length may be required to produce a level unit during lift.

Figure 7. Container spreader bar adjustment for level unit lift



Controls

Operator Interface

RSRC1020F0 and RSRC1020F2

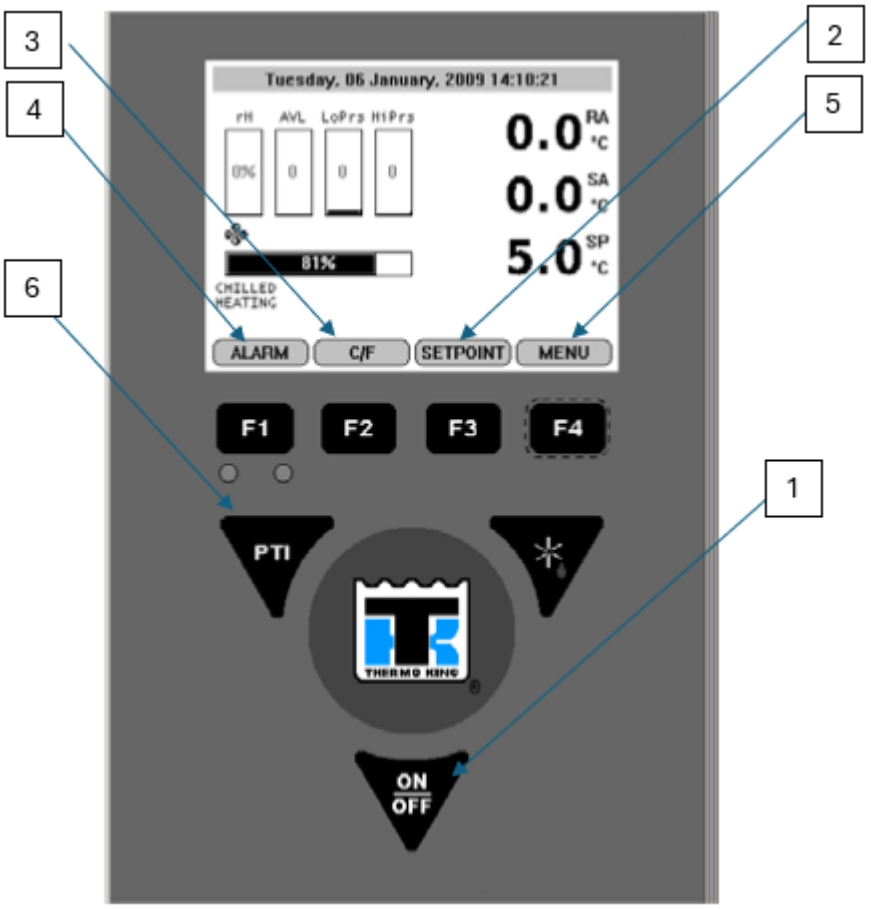
The MP4000 controller display is used to turn the refrigeration unit on/off and to adjust setpoints and enable optional controls features. The following includes a brief description of the primary control functions; for additional controls functions and information please reference Thermo King literature #TK 61959–4–OP-EN.

1. To turn unit on or off, use the **On/Off** button at the bottom of the display.
2. To adjust the container air temperature setpoint, press the **F3** key with unit running and use the **F2** and **F3** keys to adjust the setpoint up or down to the required temperature. Finally, press and hold the **F4** key to save the setpoint and return to the main screen, where the updated setpoint will be visible.
3. To temporarily adjust display units from °C to °F and vice versa, press the **F2** key from the main menu. To permanently adjust display units, hold the **F2** key from the main menu until prompted to confirm change.
4. To view alarms, press the **F1** key from the main display screen.
5. Press **F4** from the main screen to enter the menu from which the following functions can be enabled/disabled (all optional functions disable by default): Dehumidification mode, Cold Treatment mode, Multiple Temperature Setpoint Mode, and Silent Mode. Refer to Thermo King literature #TK-61110-4-OP for additional information on these optional operating modes.
6. Press the **PTI** button to enter the pre-trip inspection/functional self-test menu.

In addition to the features/modes described above, the MP4000 controller also includes status indicator lights located just under the **F1** function key, providing status as follows:

- Flashing Green LED – Temperature approaching in-range
- Solid Green LED – Temperature in-range
- Flashing Red LED – Alarm present and unacknowledged
- Solid Red LED – Alarm present and acknowledged

Figure 8. MP4000 controller



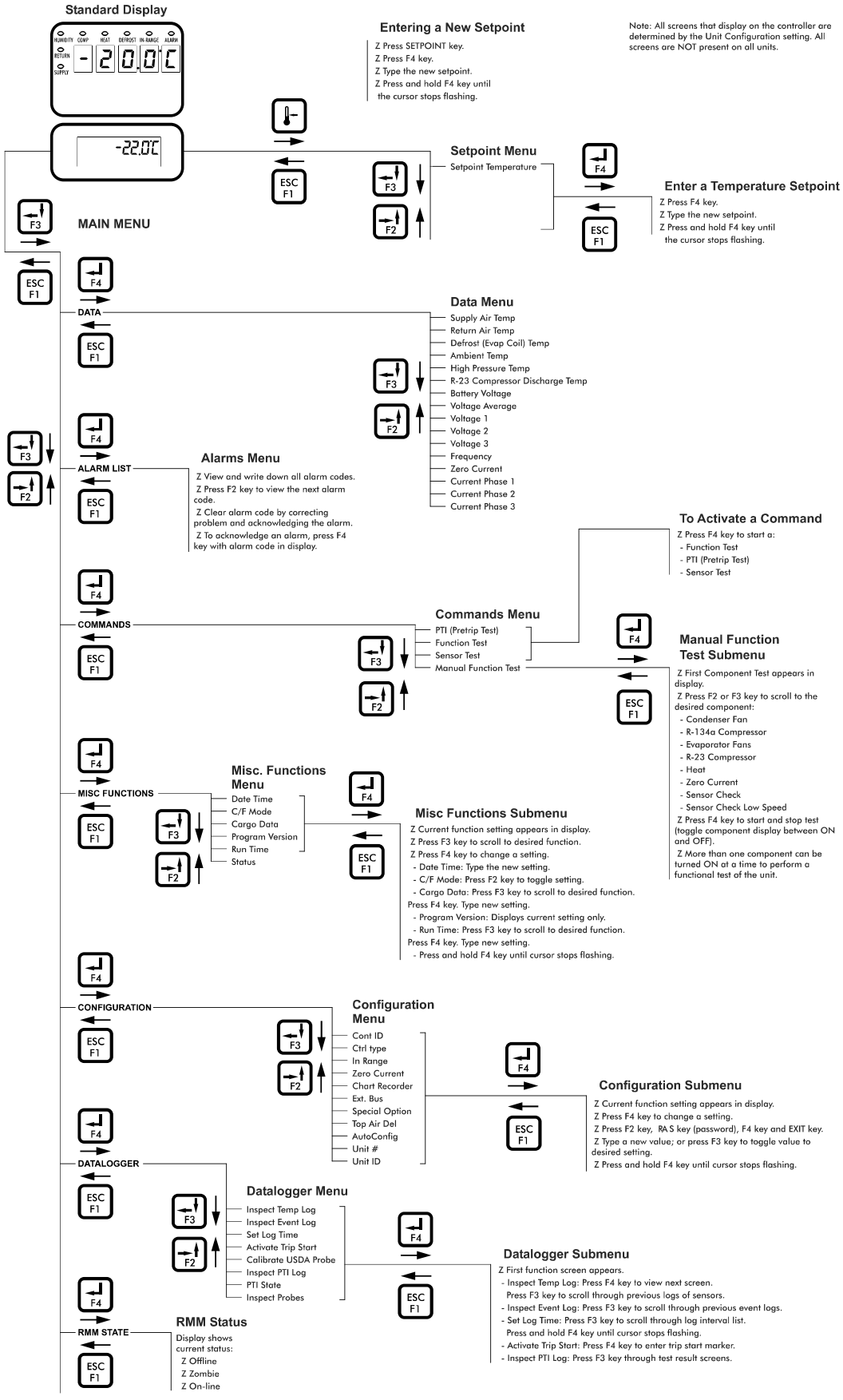
RSRC1020F1

RSRC1020F1 units are equipped with MP3000 operator interfaces which provide the following functionality:

- Setpoint adjustment
- Cargo and refrigeration system temperature data
- Operating mode selection
- Pre-trip Inspection diagnostic tools

Review Figure 3 on the following page for MP3000 operating instructions.

Figure 9. MP3000 navigation



Maintenance

For detailed maintenance procedures refer to the following documents:

- RSRC1020F0: Magnum Plus Maintenance Manual: TK 60275-4-MM-EN
- RSRC1020F1: Super Freezer Maintenance Manual: TK 50134-4-MM-EN
- RSRC1020F2: CFF Maintenance Manual: TK 61888-4-MM-EN

The table below describes regular preventative maintenance for TRS refrigerated containers.

Service Guide

A closely followed maintenance program will help to keep your Thermo King unit in top operating condition.

The following service guide table should be used as a guide when inspecting or servicing components on this unit.

Pretrip	Every 1,000 Hours	Annual/ Yearly	Inspect/Service These Items
			Electrical
x			Perform a controller pretrip inspection (PTI) check.
x	x	x	Visually check condenser fan and evaporator fan.
x	x	x	Visually inspect electrical contacts for damage or loose connections.
x	x	x	Visually inspect wire harnesses for damage or loose connections.
	x	x	Download the data logger and check data for correct logging.
		x	Check operation of protection shutdown circuits.
			Refrigeration
x	x	x	Check refrigerant charge.
	x	x	Check for proper discharge and suction pressures.
		x	Check filter drier/in-line filter for a restriction pressures.
			Structural
x	x	x	Visually inspect unit for damaged, loose or broken parts.
x	x	x	Tighten unit, compressor and fan motor mounting bolts.
	x	x	Clean entire unit including condenser and evaporator coils, and defrost drains.

Note: *If a unit has been carrying cargo which contains a high level of sulphor or phosphorous (e.g. garlic, salted fish etc.), it is recommended that clean evaporator coil after each trip.*

Notes

Trane - by Trane Technologies (NYSE: TT), a global innovator - creates comfortable, energy efficient indoor environments for commercial and residential applications. For more information, please visit trane.com or tranetechnologies.com.

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Supersedes (New)