THERMO KING

ColdCube™ Connect - *Operator's Manual*
ColdCube™ Connect - *Manuel de l'utilisateur*
ColdCube™ Connect *Manuale dell'operatore*
ColdCube™ Connect - *Betriebshandbuch*
ColdCube™ Connect - *Manual del operador*

Ingersoll Rand

ColdCube™ Connect

TK 60942-11-OP (Rev. 1, 01-2018)

www.emea-user-manuals.thermoking.com

BEN522

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The procedures described herein should only be undertaken by suitably qualified personnel. Failure to implement these procedures correctly may cause damage to the Thermo King unit or other property or personal injury.

Thermo King Corporation and its affiliates shall have no liability in contract or tort (including negligence and/or strict liability) or otherwise, to any person or entity for any personal injury, property damage or any other direct, indirect, special or consequential damage or liability whatsoever, arising out of or resulting from any actions by any person that are contrary to this manual or any of the information, recommendations or descriptions contained herein or the failure of any person to implement the procedures described herein correctly or to follow caution and safety decals located on the Thermo King unit.

Introduction

There is nothing complicated about operating and maintaining your Thermo King unit, but a few minutes studying this manual will be time well spent.

Performing pre-trip checks and enroute inspections on a regular basis will minimize on-the-road operating problems. A regular maintenance program will also help to keep your unit in top operating condition. If factory recommended procedures are followed, you will find that you have purchased the most efficient and dependable temperature control system available. (see "Cleaning and Maintenance" on page 37).

All service requirements, major and minor, should be handled by a Thermo King Dealer for these very important reasons:

- They have factory trained and certified technicians
- They have genuine Thermo King replacement parts
- They are equipped with the factory recommended tools to perform all service functions
- The warranty on your new unit is valid only when the repair and replacement of component parts is performed by an authorized Thermo King Dealer.

IMPORTANT: This manual is published for informational purposes only and the information furnished herein should not be considered as all-inclusive or meant to cover all contingencies. If more information is required, consult your Thermo King Service Directory for the location and telephone number of the local dealer.

Customer Satisfaction Survey

Let your voice be heard!

Your feedback will help improve our manuals. The survey is accessible through any internet-connected device with a web browser.

Scan the Quick Response (QR) code or click or type the web address to complete the survey: http://irco.az1.qualtrics.com/SE/?SID=SV_2octfSHoUJxsk6x

Emergency Assistance

Thermo Assistance is a multi-lingual communication tool designed to put you in direct contact with an authorized Thermo King dealer.

Thermo Assistance should only be contacted for breakdown and repair assistance.

To use this system, you need the following information before you call: (phone charges will apply)

• Contact Phone Number

• Type of TK Unit

• Thermostat Setting

• Present Load Temperature

• Probable Cause of Fault

• Warranty Details of the Unit

• Payment Details for the Repair

Leave your name and contact number and a Thermo Assistance Operator will call you back. At this point you can give details of the service required and the repair will be organized.

Please note that Thermo Assistance cannot guarantee payments and the service is designed for the exclusive use of refrigerated transporters with products manufactured by Thermo King Corporation.

BEA261

THERMO KING
Therm❄Assistance
☏ 00800 80 85 85 85

Belgium	+32 270 01 735
Denmark	+45 38 48 76 94
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Germany	+49 695 00 70 740
Italy	+39 02 69 63 32 13
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The Netherlands	+31 202 01 51 09
United Kingdom	+44 845 85 01 101
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General Inquires and Unit Maintenance

For general inquiries please contact your local Thermo King dealer.

Go to www.europe.thermoking.com and select dealer locator for your local Thermo King dealer.

Or refer to the Thermo King Service Directory for contact information.

Warranty

The ColdCube^{TM} Connect Unit Warranty is two years for parts.

A full description of the warranty is available upon request.

Accessing Operator Manual Translations

This manual is available in the following languages:

English, French, Italian, German, Spanish and Turkish. Your unit comes with English version only printed as standard. However, you can access the translated versions at the following location:

www.emea-user-manuals.thermoking.com

You can also order a printed version of your particular manual from your Thermo King Dealer Representative.

Introduction

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Safety Precautions

Thermo King recommends that all services be performed by a Thermo King dealer. However, there are several general safety practices which you should be aware of:

WARNING: Always wear goggles or safety glasses when working with or around the refrigeration system or battery. Refrigerant or battery acid can cause permanent damage if it comes in contact with your eyes.

IMPORTANT: Thermo King will not be held liable for claims for damage resulting from the following:
- *Misuse, improper installation, abnormal service, storage of hazardous chemicals, use of corrosive substances, transit damage, recharging of cooling system, accident, fire, improper repair, tampering or abuse.*
- *Incorrect voltages or faults with regard to power supply which falls outside of the ColdCube^{TM} Connect operating parameters.*

CAUTION: Danger of fatal injury from electric shocks! When using the ColdCube^{TM} Connect on boats, if the ColdCube^{TM} Connect is powered by 110-240 V AC, ensure that the power supply has a residual current circuit breaker! Check that the voltage specification on the type plate is the same as that of the power supply.
Only connect the ColdCube^{TM} Connect as follows:
- *with the 12/24 V connection cable included with the ColdCube^{TM} Connect to a 12/24 V battery.*
- *or, with the 110-240 V connection cable included with the ColdCube^{TM} Connect to the 110-240 V AC supply.*

If the cable is damaged, it must be replaced to prevent possible electrical hazards.

Disconnect the connection cable before cleaning and maintenance, after use and before changing a fuse.

Safety Precautions

CAUTION: Danger of injuries! Batteries contain aggressive and caustic acids. Avoid battery fluid coming into contact with your body. If your skin does come into contact with battery fluid, wash the part of your body in question thoroughly with water. Disconnect the ColdCube^{TM} Connect and other electric devices from the battery before you connect the battery to a quick charging device. Over-voltage can damage the electronics of the ColdCube^{TM} Connect.

WARNING: Control circuits used in the ColdCube^{TM} Connect are low voltage. This voltage potential is not considered dangerous, but the large amount of current available can cause severe burns if shorted to ground.

WARNING: Do not wear jewelry, watches, or rings. These items can short out electrical circuits and cause severe burns to the wearer.

CAUTION: Use tools with insulated handles that are in good condition.

CAUTION: Electronic devices are not toys!

The ColdCube^{TM} Connect is not intended for use by young children or infirm persons unless they have been adequately supervised by a responsible person to ensure that they can use the appliance safely. Young children should be supervised to ensure that they do not play with the appliance.

Do not operate the ColdCube^{TM} Connect if it is visibly damaged.

The ColdCube^{TM} Connect may only be repaired by qualified personnel. Inadequate repairs can cause considerable hazards. If your ColdCube^{TM} Connect should need repairing, please contact Euroengel customer service. Do not open the refrigerant circuit under any circumstances!

The ColdCube^{TM} Connect is not suitable for transporting caustic materials or materials containing solvents. Food may be stored in its original packaging or in suitable containers.

Safety Precautions

CAUTION: Danger of fatal injury from electric shocks! Do not touch exposed cables with your bare hands. This especially applies when operating the ColdCube^{TM} Connect from an AC power supply.

Before starting the ColdCube^{TM} Connect, ensure that the power supply line and the plug are dry. Do not place any electrical devices inside the cooling container.

Set up the ColdCube^{TM} Connect in a dry location where it is protected against splashing water. Protect the ColdCube^{TM} Connect and the cable against rain and moisture. Do not place it near open flames or other heat sources (heaters, direct sunlight, gas ovens etc.).

CAUTION: Danger of overheating! Always make sure there is sufficient ventilation so that heat generated during normal operation can dissipate. Ensure that the ventilation slots are not covered. Leave at least 2 inches (50 mm) from top and around the ColdCube^{TM} Connect to ensure adequate ventilation.

Never immerse the ColdCube^{TM} Connect in water. Do not fill the inner container with ice or fluid.

First Aid

First Aid–Refrigerant

Eyes: For contact with liquid, immediately flush eyes with large amounts of water. Get prompt medical attention.

Skin: Flush areas with large amounts of warm water. Do not apply heat. Wrap burns with dry, sterile, bulky dressing to protect from infection or injury. Get prompt medical attention.

Inhalation: Move victim to fresh air and restore breathing if necessary. Stay with victim until arrival of emergency medical personnel.

First Aid–Refrigerant Oil

Eyes: Immediately flush eyes with large amounts of water for at least 15 minutes while holding the eyelids open. Get prompt medical attention.

Skin: Remove contaminated clothing. Wash thoroughly with soap and water. Get medical attention if irritation persists.

Inhalation: Move victim to fresh air and restore breathing if necessary. Stay with victim until arrival of emergency personnel.

Ingestion: Do not induce vomiting. Immediately contact local poison control center or physician.

Unit Description

Thermo King ColdCube™ Connect cooling containers are the flexible and convenient solution for transportation of perishable goods in cars, trucks or vans. The heavy duty ColdCube™ Connect is made of rotationally moulded polyethylene and can be cleaned easily according to 93/43/EEC (HACCP).

NOTE: Unit models pictured here Left to Right: 140L, 330L, 720L, 82L, 32L. See page 12 for full model listing.

- Operating voltage is 12/24 V DC and 110-140 V AC, 50-60 Hz for the optional AC connection.

- The refrigerant gas is CFC free R134a R404a.

- The digital temperature controller allows easy setting of the internal temperature.

AMA1361

Figure 1: ColdCube™ Connect

Unit Description

There are sixteen ColdCube^{TM} Connect models available:

- 32 Litre in freezing
- 32 Litre in freezing and heating (Pharma)
- 82 Litre in freezing
- 82 Litre in freezing and heating (Pharma)
- 140 Litre in cooling
- 140 Litre in cooling and heating
- 140 Litre in freezing
- 140 Litre in freezing and heating (Pharma)
- 330 Litre in cooling
- 330 Litre in cooling and heating
- 330 Litre in freezing
- 330 Litre in freezing and heating (Pharma)
- 720 Litre in cooling
- 720 Litre in cooling and heating
- 720 Litre in freezing
- 720 Litre in freezing and heating (Pharma)

Unit Specifications

ColdCube™ Connect Style	Gross Capacity (Litres)	Minimum Temp*	Max Amps @ 12 VDC**	External Dimensions L x W x H (mm)	Internal Dimensions L x W x H (mm)	Weight (kg)
Freezing	32	- 24°C	9 A	670 x 390 x 480	327 x 223 x 344	22,5
Freezing & Heating (Pharma)	32	- 24°C	9 A	670 x 390 x 480	327 x 223 x 344	22,5
Freezing	82	- 24°C	9 A	940 x 560 x 551	523 x 358 x 366	35
Freezing & Heating (Pharma)	82	- 24°C	9 A	940 x 560 x 551	523 x 358 x 366	35
Cooling	140	- 10°C	10 A	1000 x 620 x 710	620 x 369 x 510	52
Cooling & Heating	140	- 10°C	10 A	1000 x 620 x 710	540 x 369x 510	54
Freezing	140	- 21°C	18 A	1000 x 620 x 710	590 x 369 510	55
Freezing & Heating (Pharma)	140	- 21°C	18 A	1000 x 620 x 710	520 x 369 x 510	57
Cooling	330	0°C	10 A	1020 x 1000 x 1000	810 x 550 x 660	80

Unit Specifications

ColdCube™ Connect Style	Gross Capacity (Litres)	Minimum Temp*	Max Amps @ 12 VDC**	External Dimensions L x W x H (mm)	Internal Dimensions L x W x H (mm)	Weight (kg)
Cooling & Heating	330	0°C	10 A	1020 x 1000 x 1000	730 x 550 x 660	83
Freezing	330	- 21°C	18 A	1020 x 1000 x 1000	780 x 550 x 660	83
Freezing & Heating (Pharma)	330	-21°C	18 A	1020 x 1000 x 1000	710 x 550 x 660	86
Cooling	720	0°C	20 A	1400 x 1100 x 1100	1020 x 850 x 780	144
Cooling & Heating	720	0°C	20 A	1400 x 1100 x 1100	940 x 850 x 780	147
Freezing	720	- 24°C	32 A	1400 x 1100 x 1100	980 x 850 x 780	150
Freezing & Heating (Pharma)	720	-24°C	32 A	1400 x 1100 x 1100	910 x 850 x 780	153

* At ambient temperature of 30°C
** Divide by 2 to get 24 VDC Amps; divide by 10 to get 120 VAC Amps

ColdCube^{TM} Connect Installation

NOTE: *Refer to ColdCube^{TM} Connect specifications page in the rear of this manual for unit max and average current requirements. Please ensure this has been taken into account for alternator and battery sizing.*

CAUTION: *Anchor the ColdCube^{TM} Connect to prevent it from shifting and causing harm to people or cargo.*

Choose a well-ventilated installation location that is protected from direct sunlight.

CAUTION: *The ColdCube^{TM} Connect unit and electrical connections are not water resistant or water proof. The ColdCube^{TM} Connect may not be used outside without proper protection from the weather.*

Electrical Connections

1	AC Power Cable
2	DC Power Cable

Figure 2: AC/DC Cover (150W Example)

Connecting to a DC Battery

NOTE: If the vehicle is equipped with a battery disconnect switch, always wire the ColdCube^{TM} Connect after the switch. This allows power to the ColdCube^{TM} Connect to be turned off by the battery disconnect switch.

CAUTION: Danger of damaging the ColdCube^{TM} Connect! Over-voltages can damage device electronics. Disconnect the cooling container and other consumers from the battery before charging the battery with a quick charging device.

For safety reasons, the cooling container is equipped with an electronic system to protect it against reversed polarity when connecting to a battery.

CAUTION: Danger of damaging the ColdCube^{TM} Connect! To prevent voltage and power losses, the cable should be as short as possible and not be interrupted. For this reason avoid additional switches, plugs or socket strips

The ColdCube^{TM} Connect is supplied with a standard length DC battery cable with a fuse on the positive side. If this cable cannot be used, the fuse must be transferred to the cable installed.

Determine the required cross section of the cable in relation to the cable length according to the following table:

## Cable Length, 12 V & 24V DC

140, 330 and 720 Litre Cooling			
Cross section		Max Length 12V	Max Length 24V
(mm^2)	(AWG)	(m)	(m)
2.5	13	2.5	5
4	11	4	8
8	6	6	12
10	7	10	20

ColdCube™ Connect Installation

32, 82, 140, 330 and 720 Litre Freezing			
Cross section		Max Length 12V	Max Length 24V
(mm²)	(AWG)	(m)	(m)
5	10	2.5	5
8	8	4	8
12	6	6	12
20	4	10	20

⚠️ *CAUTION: Danger of damaging the ColdCube™ Connect! Make sure that the polarity is correct.*
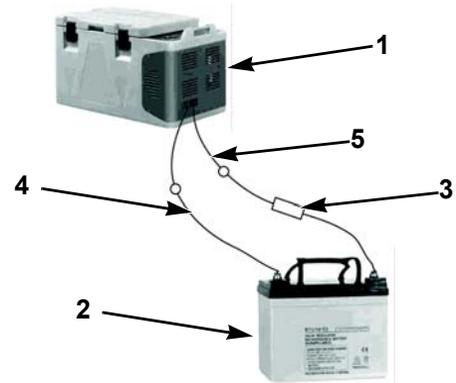
1	ColdCube™ Connect	4	Negative
2	Battery	5	Positive
3	Fuse		

Figure 3: Battery Connections

➤ Before starting up the ColdCube^{TM} Connect for the first time, check whether the operating voltage and the battery voltage match (see type plate).

➤ Make sure that the cable at the positive battery terminal is protected with a fuse. See Figure 3.

Fuse Sizes

- 32 Litre in freezing: 16 A
- 32 Litre in freezing and heating (Pharma): 16 A
- 82 Litre in freezing: 25 A
- 82 Litre in freezing and heating (Pharma): 25 A
- 140 Litre in cooling: 30 A
- 140 Litre in cooling and heating: 30 A
- 140 Litre in freezing: 50 A
- 140 Litre in freezing and heating (Pharma): 50 A
- 330 Litre in cooling: 30 A
- 330 Litre in cooling and heating: 30 A
- 330 Litre in freezing: 30 A
- 330 Litre in freezing and heating (Pharma): 30 A
- 720 Litre in cooling: 50 A
- 720 Litre in cooling and heating: 50 A
- 720 Litre in freezing: 50 A
- 720 Litre in freezing and heating (Pharma): 50 A

Low Voltage DC Protection

The ColdCube^{TM} Connect is equipped with a battery monitor that protects the compressor from low voltage when connected to DC power. Thermo King has set the compressor low voltage disconnect higher than required to provide partial battery protection. If the ColdCube^{TM} Connect is operated when the vehicle ignition is switched off, the compressor switches off automatically as soon as the supply voltage falls below a set level. The compressor will switch back on once the battery has been recharged to the restart voltage level (normally 1.3 V higher than the cut-out value).

NOTE: The battery monitor only switches the compressor off and not the fans or controller, therefore a residual draw of 1 to 1.5 amps on the battery will remain unless the ColdCube^{TM} Connect power switch is turned off.
We highly recommend installing an ignition switch relay to turn off the ColdCube^{TM} Connect when the vehicle is not running.

Connecting to a 110-240 VAC Power Source

CAUTION: Danger of electrocution! Never handle plugs and switches with wet hands or if you are standing on a wet surface.

The ColdCube^{TM} Connect can be purchased with the option of a built-in multi-voltage electrical connection adapter with a priority circuit for connecting to a 110-240 VAC supply. The priority circuit automatically switches to VAC operation if the ColdCube^{TM} Connect is connected to a 110-240 VAC supply, even if the 12/24 V cable is still connected.

If both power sources are connected, AC power is selected. If the AC power supply is disconnected or drops below 85 VAC there will be a one minute time delay before the compressor switches to operate on DC power. If AC power is established at any time, there will be no delay to compressor operation.

➤ Plug the AC connection cable into the AC voltage.

ColdCubeTM Connect Installation

HACCP / Bluetooth Module - Optional

EVconnect is an easy solution that helps to easily get HACCP temperature and to manage the temperature alarms.

EVconnect is made of:

- EVLINK
- a memory and transmission module (provided with 16 Mb memory, real time clock and Bluetooth 4.0 transmission module)
- EVconnect App for Android 4.4 devices

EVLINK is available as an accessory and the App is freely download-able on Google Play (an Apple version is under development).

This solution is capable of storing at least one year of recordings, that the user can download via Bluetooth into a smartphone or tablet without losing data. Temperature graph is immediately available as far as the possibility of send via e-mail the information as image or ".csv" file for Excel.

Wiring

The EVLINK module should be connected to the EVCO thermostat using the TTL port on the side of the same. Do not try to extend the wirings. For full installation and use instructions see the notes provided with the EVLINK.

It is the EVlink module that features a real time clock, data storage and Bluetooth transmission. You have to wire connect the module to the controller (by removing the front panel) and then you can pair the module to your Android phone by the EVconnect App.

Regulator Display

The very first time a regulator is connected to the EVlink, the RTC alarm can appears. The user can decide to set the real time clock via keyboard (1) or via APP (2).

(1) Unlock the device keyboard if necessary, push **Down** key for 2", "rtc" appears. Push repetitively **SEt** key to select the rtc_items year, month... (Y-- n-- d--) and change value with **UP/DOWN**.

(2) By connecting EVconnect you will be asked to synchronize with the local time of your device.

How to Start Using the App

Download App in Your Device

From **GOOGLE PLAY** select the free **EVConnect** application.

Compatible with

- Android 4.4

- BLE 4.0 Low Energy

The App enables the language of your device if available.

Start the App

1. If not active, you will be required to enable the Blue Tooth.

2. BLE SCANNNING When starting EVconnect checks the BLE compatible devices that are listed below.

3. ⚙ under the SETUP icon it is possible to select the language if necessary.

4. Select **EVLINK #1** and wait some seconds. Be aware of not selecting other items of the list.

5. Real time clock synchro: if necessary you will be required to synchronize the clock.

6. PASSWORD

   The default passwords are the following:

       Limited access (end user): 426

       Full access (service): 826

   Be aware that the unit may have different settings.

Home Page

The Home Page allows you to easily operate with 4 main selections: HACCP, REAL TIME, ALARMS, and SERVICE while with the following setup icons you can:

1. ⏻ To go back to scan list of the compatible BLE 4.0 devices.

2. 🛠 To enter the basic settings:

CONNECTION NAME: give a connection name between the smart device and the EVLINK unit. All the saved settings are automatically repeated with the next connection.

DEVICE NAME: it allows to set a name to the physical device. The new device name will be in substitution of the EVLINK#1. Be aware when using small display smart phones, a device name too long implies a shorter reading data space area.

HACCP: to manage the recordings:

- **START/STOP REG:** stop recordings

- **INSTANT READING:** to log instantaneously, eg: without waiting the log interval time.

- **RESET:** to reset the whole memory. Be aware that logs are no more reloaded.

PASSWORD: To modify the password level (user or service) by entering the corresponding password.

FIRMWARE VERSION AND PROTOCOL: system identification data.

Push back arrow ← to go back to HOME.

HACCP Reading

1. After having enough recordings into the memory, push (HACCP) to access the logs. Remember that the recording interval time is a parameter of the main controller.

2. The daily recordings (today) are downloaded after a while. These icons can follow the data:

3. ⚠ = bad alarm occurred.

4. = event or alarm occurred

Available intervals of data to download .

To help the user a popup menu allows to download some defined interval of times such as: Today, Last Week, from to etc.

Push to go back to HOME.

Showing the Data

 select the variables to show

 show as graph format

 (top left) back to **table** format

 send the data (e-mail, etc.)

Data can be sent as graph image of the main variables or ".csv" file containing the day by day data (a complete file).

 information / details

20/05/16
12:09   50.7

Push on the information key allows you to check additional events that are combined with that temperature recording such as probe error readings, main regulation status and alarms.

CLOSE to go back.

Real Time Data

 Select this icon to access the real time data readings. A list of functioning status are displayed such as: regulation temperatures, status of the relays (compressor, defrost, fans), and functions: energy saving, defrost etc. Manual Commands are available depending on the model of the controllers.

Real Time Alarms

 Select this icon to show actual alarms with its description.

Service

 NOTE: Expert only with service password.

Push this icon to access a 4 items menu:

Real for real time data with limited variables.

Service for all the variables of the unit.

ALAR for all the possible alarms of the unit.

PAR for local parameter manager.

Parameters for Expert Only

This selection allows to check or modify a run time parameter value, wait to download the full list before operating (some seconds depending on the controller model).

AVILABLE OPERATION

1. PAR menu: load instantaneously the parameter map, wait some seconds before the data are completely downloaded.

2. Scroll the list and /select the parameter.

3. Change and save the new parameter value. Be aware that the operation is completed just after pushing CONFIRM button.

4. Export a map.

5. Import a map.

HACCP / Bluetooth Module - Optional

ColdCube^{TM} Connect Operation

⚠️ *CAUTION: Danger of overheating! Ensure at all times that there is sufficient ventilation so that the heat that generated during operation can dissipate. Ensure that the ventilation slots are not covered and that the unit is sufficiently far away from walls and other objects so that the air can circulate.*

Control Panel

Figure 4: Control Panel

The control panel of all fridges consist of 3 elements:

1. the main switch
2. the electronic thermostat (touchscreen type)

3. the red led light of self-diagnostic or the jack for the connection to SECOP communication gateway and Tool4Cool diagnostic software (only units with BD220CL compressor).

Electronic Thermostat (EVCO)

The EVCO electronic thermostat has a digital touchscreen display and an alarm buzzer.

Figure 5: Display

ColdCubeTM Connect Operation

Following icons are active on the display:

Icon	On	Off	Flashing
❄	Compressor on	Compressor off	Setpoint setting active
HACCP	Saved HACCP alarm in Evlink		
➴			Setting active Operation with EVconnect App active
°C/°F	View temperature (°C or °F)		
AUX	Heating on (if applicable)	Heating off (if applicable)	

Figure 6: Display Icons

To operate the thermostat the touchscreen keys are:

Key	Description	Key	Description
⌂ SET	SET keypad lock	∧ ⚙	UP
FNC ∨	DOWN	⚙ ⏻	Off[1]

Figure 7: Display Keys

[1] Quick exit from programming procedure, with last set values saved in memory

The display can show following alarm labels:

Label	Description
"Pr1"	Cabinet probe alarm
"AL"	Low temperature alarm
"AH"	High temperature alarm

Figure 8: Alarm Labels

Switch ON the Unit

NOTE: Before starting your ColdCube^{TM} Connect for the first time, you should clean it inside and outside with a damp cloth.

Switch on the unit by turning the main switch to position **"I"**.

The digital thermostat will run a self-test. Following the initialization, the present temperature inside the unit appears. The factory preset temperature for all models is +4°C.

Switch OFF the Unit

Switch off the unit always by pressing the main switch to position **"O"**. The unit will take the last set temperature in memory. If you do not want to use the cooler for a longer period of time, leave the cover slightly open. This prevents odor build-up.

Lock / Unlock the Keypad

If 30 seconds have elapsed without the keys being pressed, the display will show the **"Loc"** label and the keypad will lock automatically.

To unlock the keypad, touch a key for 1 second: the display will show the label **"UnL"**.

Modify the Setpoint

Check that the keypad is not locked.

1. Touch the SET key.

2. Touch the UP or DOWN key within 15 seconds to set the new value.

3. Touch the SET key (or do not operate for 15 seconds).

Setting Configuration Parameters

1. Touch the SET key for 4 seconds; the display will show the label **"PA"**.

2. Touch the SET key, the display will show the value **"0"**.

3. Touch the UP or DOWN key within 15 seconds to set **"-19"**.

4. Touch the SET key (or do not operate for 15 seconds), the display will show the label **"SP"**.

5. Touch the UP or DOWN key to select a parameter to modify.

6. Touch the SET key, the display will show the actual value.

7. Touch the UP or DOWN key within 15 seconds to set the value.

8. Touch the SET key (or do not operate for 15 seconds).

9. Touch the SET key for 4 seconds (or do not operate for 60 seconds, or press the OFF key) to exit the procedure.

Enable Temperature Decimal Point

NOTE: Not available with °F.

1. Follow the parameter setting procedure.

2. Reach parameter **"P1"**.

   0 = no   1 = yes (default: 1)

3. Exit the procedure.

Change Temperature Unit of Measure (°C or °F)

1. Follow the parameters setting procedure.

2. Reach parameter **"P2"**.

   0 = °C   1 = °F (default: 0)

3. Exit the procedure

Set a Cabinet Probe Offset

1. Follow the parameters setting procedure.

2. Reach parameter **"CA1"**.

   Min ... Max values are -25 ... +25 °C/°F

3. Exit the procedure.

Set High / Low Temperature Alarm

The EVCO electronic thermostat is equipped with an internal buzzer and high / low temperature alarms can be set. As there is not real time clock, back up battery and memory, alarms are active only with power connected and are not recorded.

ColdCubeTM Connect Operation

1. Follow the parameters setting procedure.

2. Reach parameter **"A2"** (low temperature alarm type), touch UP or DOWN to select a value and touch SET key to set it.

   0 = disabled, 1 = relative to set point, 2 = absolute (default is 0)

3. Reach parameter **"A1"** (threshold for low temperature alarm), touch UP or DOWN to select a value and touch SET key to set it.

   Min … Max values are -99 … +99 °C/°F

4. Reach parameter **"A5"** (high temperature alarm type), touch UP or DOWN to select a value and touch SET key to set it.

   0 = disabled, 1 = relative to set point, 2 = absolute (default is 0)

5. Reach parameter **"A4"** (threshold for high temperature alarm), touch UP or DOWN to select a value and touch SET key to set it.

   Min … Max values are -99 … +99 °C/°F

6. Reach parameter **"A6"** (high temperature alarm delay after power on), touch UP or DOWN to select a value and touch SET key to set it.

   Min … Max values are 0 … 99 minutes (default is 0)

7. Reach parameter **"A7"** (high/low temperature alarms delay), touch UP or DOWN to select a value and touch SET key to set it.

   Min … Max values are 0 … 240 minutes (default is 0)

8. Reach parameter **"A11"** (high/low temperature alarms reset differential), touch UP or DOWN to select a value and touch SET key to set it.

   Min … Max values are 1 … 15 °C/°F (default is 2.0)

9. Touch the SET key for 4 seconds (or press the Off key) to exit the procedure.

In case of High / Low temperature alarm the display will show **"AL"** or **"AH"** and the buzzer sound.

The temperature alarms have automatic reset. To silence the buzzer press a key.

Energy Saving Tips

- Allow hot perishable items to cool down first before you place it into the ColdCube^{TM} Connect.

- Do not open the cooling container more often than necessary.

- Defrost the cooling container once a layer of ice forms.

- Avoid unnecessarily low temperature settings.

Replacement of the ColdCube^{TM} Connect Fuse

⚡ *CAUTION: Danger of electrocution! Disconnect the connection cable before you replace the ColdCube^{TM} Connect fuse.*

1. Switch off the ColdCube^{TM} Connect.

2. Pull the connection cable off.

3. Pry out the fuse (Figure 3) with a screwdriver.

4. Replace the defective fuse with a new fuse that has the same rating as shown on page 18.

5. Press the fuse back into the housing.

Pre-Cooling Load

Pre-cool or freeze goods before putting them in the ColdCube^{TM} Connect. The ColdCube^{TM} Connect is designed to maintain product temperature, not to pull down product temperature.

Pre-Cooling ColdCube^{TM} Connect

The ColdCube^{TM} Connect is a highly insulated unit designed to maintain product temperature with minimal electrical consumption. The ColdCube^{TM} Connect is not designed for fast temperature pull down. You may need to pre-cool or pre-freeze an empty ColdCube^{TM} Connect for several hours to reach the setpoint temperature before loading product.

Defrost

The ColdCube^{TM} Connect is not designed for automatic defrosting. If excess frost builds up, clean out the frost.

Troubleshooting

⚠️ **CAUTION: Before performing any service, disconnect the battery cables at the battery and also disconnect the AC supply.**

The ColdCube™ Connect has a built-in self diagnostic program.

On all models with BD50 and BD80 compressors there are a red led light nearby the electronic thermostat. In case the PCB of the compressor records an operational error, the diode will flash a number of times. The number of flashes depends on what kind of operational error was recorded. Each flash will last 1/4 second. After the actual number of flashes there will be a delay with no flashes, so that the sequence for each error recording is repeated every 4 seconds.

In the case of units with the BD220 compressor (now the F0720/FDN and F0720/FDH) you do not have led lights but a jack to connect a specific Secop interface (the "One Wire Gateway") to a computer with the Secop "Tool4Cool" software installed. The T4C software can be freely downloaded from Secop website. You can set and monitor all working parameters of the BD220 compressor, including working time, failures, etc. directly from the T4C software.

1 Flash	Battery protection cut/out	The battery voltage has fallen below the cut/out setting. Check the source battery for proper operation and sufficient voltage output. If power source is adequate then check wire sizes and conditions of the connectors to avoid voltage drops. Charge source battery.
2 Flashes	Fan over- current cut/out	The fan loads the electronic unit with more than 0,5 A (avg) or 1,0 A (peak). Fan may be blocked, fan wires may be loose or damaged or the fan motor has failed and is drawing over/current to protect itself. Visually inspect fan for blockage, check wires for chafes or loose connections and repair. Or if fan has failed then replace it.

ColdCubeTM Connect Operation

3 Flashes	Motor start error	The rotor is blocked or the differential pressure in the refrigeration system is too high (> 5 bar). Compressor may not start because of high refrigerant pressure due to a high heat situation. High ambient temperatures may cause excessive heat, if so then the area around the ColdCubeTM Connect must be cooled down before trying to restart compressor. Or, if compressor just cycled off, wait a few minutes for pressure to come down and try again.
4 Flashes	Minimum motor speed error	If the refrigerant system is too heavily loaded, the compressor motor cannot maintain minimum speed 1,850 rpm. As above this may happen when system and/or ambient area is very hot which increases refrigerant pressure. Solution is as above, let area cool dawn and wait awhile before starting ColdCubeTM Connect.
5 Flashes	Thermal cut/out of electronic unit	If the refrigeration system has been too heavily loaded, and if the ambient temperature is high, the electronic unit will run too hot. As with all electronics, the compressor module is sensitive to heat, The module has a temperature sensor on the heat sink and if it gets too hot, due to high amp draw or high ambient temperatures, the ColdCubeTM Connect will shut down.
6 Flashes	Thermostat failure	If the NTC thermistor is short-circuit or ha no connection.

If the test light shows 3, 4 or 5 flashes then verify that there is adequate ventilation around the refrigerator/freezer. Check that vents are not blocked or dirty. Ensure that the ColdCubeTM Connect is not installed near a heat source.

In case ColdCubeTM Connect does not function, with display off, check the fuse and/or the proper connection to battery / AC connection.

ColdCube™ Connect Operation

In the case of units with the BD220 compressor (now the 720 Litre in freezing and 720 Litre in freezing & heating) you do not have led lights but a jack to connect a specific Secop interface (the "One Wire Gateway") to a computer with the Secop "Tool4Cool" software installed. The T4C software can be freely downloaded from Secop website. You can set and monitor all working parameters of the BD220 compressor, including working time, failures, etc. directly from the T4C software.

Apart from possible problems identified by the red LED light of the self diagnosis system, other possible problems are:

Problem	Possible Reason	Action
The ColdCube™ Connect works connected to the AC but not connected to 12/24 VDC (everything off)	DC fuse burn out	Replace fuse
	DC cord defective or not properly connected on socket	Check and, in case, replace DC cord
	Main switch defective	Replace main switch
	Electronic unit defective	Replace electronic
The ColdCube™ Connect works connected to 12/24 VDC but not connected to the AC (everything off)	Main switch defective	Replace main switch
	Electronic unit defective	Replace electronic

ColdCube™ Connect Operation

Problem	Possible Reason	Action
The ColdCube™ Connect switch on (controller glows) but compressor and fan don't run	Error in controller programming	Re-set on the right programming parameters
	Controller defective (in case compressor and fan icon on are lighted)	Replace controller
	Defective wire connection	Check or replace wires
The ColdCube™ Connect is working but fan is stopped (see also self diagnosis)	Defective wire connection	Check
	Fan defective	Replace fan
	Electronic unit defective	Replace electronic

Problem	Possible Reason	Action
The ColdCube™ Connect is working but not cooling down	Lack of refrigerant gas	Check for refrigerant gas leakage and vacuum / recharge the unit gas quantity on the serial number label.
	Oil in the circuit (probably the ColdCube™ Connect has operated for some time with a high angle)	Repeat short operation cycles (few minutes on and then 5 minutes off) to let the oil turn back to compressor. If not solved then vacuum and recharge.
	Compressor defective	Replace compressor

Cleaning and Maintenance

⚠️ **CAUTION: Danger of electrocution! Always disconnect any electrical connection before you clean and service the units.**

⚠️ **CAUTION: Danger of damaging the ColdCube™ Connect! Do not wet the electronic components. They are not water proof!**

⚠️ **CAUTION: Danger of damaging the ColdCube™ Connect! Do not use abrasive cleaning agents or hard objects during cleaning as these can damage the ColdCube™ Connect. Never use brushes, scouring pads or hard or pointed tools to remove ice or to loosen objects which have frozen in place.**

Clean the unit before first time use and at regular intervals thereafter.

IMPORTANT: Do not wet the electronic components, are not water proof!

Use only neutral (food safe) cleaning agents. Never use aggressive or caustic cleaning agents, scouring powder, steel wool, abrasive sponges or chemical solvents. Never use brushes, scouring pads or hard or pointed tools to remove ice or to loosen objects which have frozen in place.

The use of a high pressure cleaner and/or steam jet is strictly forbidden.

Clean the unit (inside and outside) with a neutral detergent, rinse with lukewarm water and dry it before any long term storage unplugged.

Humidity can form frost in the interior of the cooling device. This reduces the cooling capacity. Defrost the device in good time to avoid this. Wipe off the melted water with a damp cloth.

The hermetic cooling circuit of the units are maintenance free. No periodical maintenance is requested.

Recover Refrigerant

At Thermo King, we recognize the need to preserve the environment and limit the potential harm to the ozone layer that can result from allowing refrigerant to escape into the atmosphere.

We strictly adhere to a policy that promotes the recovery and limits the loss of refrigerant into the atmosphere.

In addition, service personnel must be aware of Federal regulations concerning the use of refrigerants and the certification of technicians. For additional information on regulations and technician certification programs, contact your local THERMO KING dealer.

Ingersoll Rand

Thermo King® is a brand of Ingersoll Rand. Ingersoll Rand (NYSE:IR) advances the quality of life by creating and sustaining safe, comfortable and efficient environments. Our people and our family of brands — including Thermo King®, Trane®, Ingersoll Rand®, Club Car® and Schlage® — work together to enhance the quality and comfort of air in homes and buildings; transport and protect food and perishables; secure homes and commercial properties; and increase industrial productivity and efficiency. We are a $14 billion global business committed to a world of sustainable progress and enduring results.

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