



Minicool-5 (-V)



Minicool-10 (-V)



Minicool-20 (-V)

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COOLER UNIT Minicool



Minicool-5 (-V)



Minicool-10 (-V)



Minicool-20 (-V)

Safety Instructions

This unit is not a dangerous product, but in case of incorrect installation and/or incorrect use, dangerous situations could occur.

We recommend that you start by reading this installation, operation and maintenance instruction completely before starting to install the unit. In particular you should pay attention to the warnings and instructions below:

- Follow the lifting instruction when you install the unit. Do not lift and pry the pipes, as this could result in outleaking refrigerant.
- **Warning!**
In case of leaking refrigerant, there is a risk for frost-bites or burns if in direct contact with the refrigerant in hotgas or liquid phase.
- In case of service/maintenance of the machine, special attention should be paid to the warnings listed on page 6.

Mounting

Unpacking

Please verify that the material is undamaged and that the number of pieces corresponds with the consignment note.

Frigadon does not take any responsibility for damages due to transportation. Any damages should be reported immediately to the transporter.

Installation

Installation of the Cooling Unit

- A. Start by cutting the hole in the ceiling for the unit.

Dim (mm)	Minicool-5	Minicool-10	Minicool-20
Width	545	545	610
Height	645	645	710
Min. dist. to floor/roof - short side	500	500	500
Min. dist. to wall - long side	200	200	200

- B. Lift the unit in place from outside the cold room. Lift underneath the machine (the middle, main) body and not in the covers (the peripheral parts of the housing).
- C. Unscrew the front cover and fasten the unit in the wall with the appropriate screws.
- D. Enter the cold room and fill up with insulation around the unit up to the level of the inside surface of the wall.

Electric connection

Please verify that the unit is switched off on its control panel. Connect it to a circuit breaker and supply voltage is 230V/1/50.

Starting up the unit

If the outside temperature is below +5 °C, the compressor should be preheated.

- Verify that the control switch on the control box is switched off. Also verify the operating fuse in the "electric box" is turned in on position.
- Switch on the circuit breaker.
- The compressor is now heated by a crank case heater. Wait for about 4-8 hours (depending on the outside temperature) until the compressor has become warm, before the control switch on the control box is switched on.

For units used indoors, and when the outside temperature is warm, the control switch can be switched on right away.

Set point adjustment

How to see and modify the set point:

- Push and immediately release the SET key: the display will show the Set point value.
- The SET LED start blinking.
- To change the Set value push the Up or Down arrows within 10 seconds.
- To memorise the new set point value push the SET key again or wait 10 seconds.

Note! The temperature can only be set within the range intended for the unit.

Final Control

The evaporator fan should start when the temperature in the evaporator is about +5 °C.

The compressor should start after about 3 minutes and the condenser fan should start a short while after the compressor.

Operation and Maintenance

Description of the Unit

Frigadon cooling unit Minicool is intended for installation in interior or outside (only -V versions) walls for cooled rooms.

Ambient temperature should be between -20 and $+30$ °C. For areas with colder temperatures, arctic version should be selected and similar for areas with warmer ambient temperatures, tropic version should be selected.

Sound level is lower than 70 dB(A).

Operating Instruction

On the Control Panel You Find

- Control switch
- Temperature regulator
- Light switch (only Minicool-5)

Description of Components

Control Voltage Fuse

There is a fuse for the control voltage. It protects the control circuit only, and is 10 A.

WARNING! The control voltage fuse do not cut the current to the complete unit. By electric works the circuit breaker should also be switched off, or the flexible cord be unplugged from its wall socket.

Main Switch

For switching the unit on or off.

WARNING! The control switch does not cut the current to the complete unit. By electric works the circuit breaker should also be switched off, or the flexible cord be unplugged from its wall socket.

Temperature Regulator

The regulator controls the room temperature by regulating the running time of the compressor. The longer the compressor runs, the colder in the room, provided that the right size of the unit has been installed.

It is possible to see the min temperature by press and release the \downarrow key. The "Lo" message will be displayed followed by the minimum temperature recorded. By pressing the \downarrow key or waiting for 5 sec the actual temperature will be displayed.

Similar the max temperature can be displayed by pressing the \uparrow key and the "Hi" message will be displayed followed by the maximum temperature.

To reset the stored temperature, when max or min temperature is displayed: Press \langle SET \rangle key until "rST" label starts blinking.

Temperature alarm

The temperature alarm is not activated at delivery. Please see separate instruction in the appendix how to activate the alarm.

Set values

The setting values of pressurestats etc see "Test certificate". For the temperature regulator parameters and the default values are presented in separate instruction in the appendix.

Maintenance

The unit does not require any regular maintenance, but it is recommended to carry out an operation check now and then, to make sure that the unit is working properly.

Check and pay particular attention to

- unfamiliar sounds and vibrations
- oil leaks
- corrosion on pipes etc
- loose pipe clips
- that nothing is obstructing a couple of meters in front of the evaporator and that goods are stored in such a way that good air circulation is obtained in the cold room.
- that condenser fan and evaporator fan work properly.
- that the condenser is not stuffed with dirt.

Cleaning of the Unit

If the unit needs cleaning, use a damp cloth with a mild detergent.

Technical Inspection

Depending on how much and which refrigerant the unit contains, some countries require regular inspections of your cooling plant. The type plate under the condenser cover of the unit states with which refrigerant your unit is filled and its weight. Ask your installation contractor what regulations apply for your country.

Errors

Warning!

- **Working in the refrigerant circuit must only be done with company with refrigerant certificate!**
- **The refrigerant in this unit must not be discharged to the environment!**
- **The refrigerant, type HFC is free of "freon". The refrigerant is not health damaging and has a slight influence on the green house effect.**
- **The refrigerant in this unit must not be replaced by another type of refrigerant without approval from authorized refrigeration company or manufacturer.**
- **There is a risk of frost bites in case of out leaking refrigerant in liquid phase.**

In case of malfunction

Always make sure that

the socket plug is connected and/or the circuit breaker is turned on.

the main fuse in the main central is not blown.

the control voltage fuse is not blown and/or the main switch is turned on.

In case of service

Always use a certified company in case of service. Ask for a written service protocol.

How to contact Frigadon

Prepare and have the following information ready to simplify the contact with us:

- Model type (i.e. Minicool-10-DI-V etc)
- Serial number

You can get the information from the id-sign usually placed where the electrical supply cable goes in to the unit.

You can contact Frigadon by:

e-mail:

frigadon@frigadon.se

Phone:

035-16 64 60, kl. 08.00-16.30 (Lunch 12.00-13.00)

Fax:

035-12 40 23

CE DECLARATION OF CONFORMITY

We at Frigadon AB, Kvarndalsvägen 12, 302 41 Halmstad, SWEDEN declares under our sole responsibility that the product:

Refrigeration unit: Minicool-5, Minicool-10, Minicool-20
with or without the option: -V, -DI, -CU, -EU, -LD, -VK, -T or -S

to which this declaration relates is in conformity with the following standards or other normative documents:

- Svenska Elektrotekniska Normer, Svensk Standard SS-EN 60 204-1, of 21 May 2007
- Elinstallationsreglerna SS 4364000
- Starkströmsföreskrifterna, ELSÄK-FS 2008:1
- EN 378-2:2008 specification for refrigerating systems and heat pumps

following the provisions of Directive:

- EC machinery directive 2006/42/EC
- EC Low voltage directive 2006/95/EC
- EMC Directive 2004/108/EC
- PED Pressure Equipment directive 97/23/EC

Halmstad, Sweden 2013-03-14



Björn Skattberg



Digital controller with off cycle defrost and AUX relay XR30CX

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1. GENERAL WARNING

1.1 PLEASE READ BEFORE USING THIS MANUAL

- This manual is part of the product and should be kept near the instrument for easy and quick reference.
- The instrument shall not be used for purposes different from those described hereunder. It cannot be used as a safety device.
- Check the application limits before proceeding.

1.2 SAFETY PRECAUTIONS

- Check the supply voltage is correct before connecting the instrument.
- Do not expose to water or moisture: use the controller only within the operating limits avoiding sudden temperature changes with high atmospheric humidity to prevent formation of condensation
- Warning: disconnect all electrical connections before any kind of maintenance.
- Fit the probe where it is not accessible by the End User. The instrument must not be opened.
- In case of failure or faulty operation send the instrument back to the distributor or to "Dixell S.p.A." (see address) with a detailed description of the fault.
- Consider the maximum current which can be applied to each relay (see Technical Data).
- Ensure that the wires for probes, loads and the power supply are separated and far enough from each other, without crossing or intertwining.
- In case of applications in industrial environments, the use of mains filters (our mod. FT1) in parallel with inductive loads could be useful.

2. GENERAL DESCRIPTION

Model XR30CX, format 32 x 74 mm, is a digital thermostat with off cycle defrost designed for refrigeration applications at normal temperature. It provides two relay outputs, one for the compressor, the other one can be used as light, for alarm signalling or as auxiliary output.. It is also provided with 2 NTC or PTC probe inputs, the first one for temperature control, the second one, optional, to connect to the HOT KEY terminals to signal the condenser temperature alarm or to display a temperature. The digital input can operate as third temperature probe.

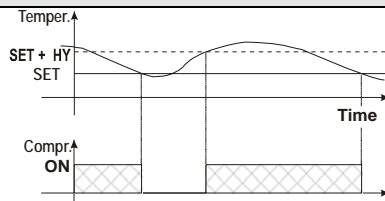
The HOT KEY output allows to connect the unit, by means of the external module XJ485-CX, to a network line ModBUS-RTU compatible such as the 21/03#monitoring units of X-WEB family. It allows to program the controller by means the HOT KEY programming keyboard. The instrument is fully configurable through special parameters that can be easily programmed through the keyboard.

3. CONTROLLING LOADS

3.1 COMPRESSOR

The regulation is performed according to the temperature measured by the thermostat probe with a positive differential from the set point: if the temperature increases and reaches set point plus differential the compressor is started and then turned off when the temperature reaches the set point value again.

In case of fault in the thermostat probe the start and stop of the compressor are timed through parameters "CO_n" and "CO_F".



3.2 DEFROST

Defrost is performed through a simple stop of the compressor. Parameter "IdF" controls the interval between defrost cycles, while its length is controlled by parameter "MdF".

4. FRONT PANEL COMMANDS



SET: To display target set point; in programming mode it selects a parameter or confirm an operation.

DEF (snowflake icon): To start a manual defrost

UP (up arrow): To see the max. stored temperature; in programming mode it browses the parameter codes or increases the displayed value.

DOWN (down arrow): To see the min stored temperature; in programming mode it browses the parameter codes or decreases the displayed value.

Power (power icon): To switch the instrument off, if onF = oFF.

Light (light icon): To switch the light, if oA1 = Lig

KEY COMBINATIONS:

UP + DOWN + #: To lock & unlock the keyboard.

SET + DOWN: To enter in programming mode.

SET + UP + #: To return to the room temperature display.

4.1 USE OF LEDS

Each LED function is described in the following table.

LED	MODE	FUNCTION
	ON	Compressor enabled
	Flashing	Anti-short cycle delay enabled
	ON	Defrost enabled
	ON	An alarm is occurring
	ON	Continuous cycle is running
	ON	Energy saving enabled
	ON	Light on
AUX	ON	Auxiliary relay on
°C/°F	ON	Measurement unit
°C/°F	Flashing	Programming phase

5. MAX & MIN TEMPERATURE MEMORIZATION

5.1 HOW TO SEE THE MIN TEMPERATURE

1. Press and release the **X** key.
2. The "Lo" message will be displayed followed by the minimum temperature recorded.
3. By pressing the **X** key again or by waiting 5s the normal display will be restored.

5.2 HOW TO SEE THE MAX TEMPERATURE

1. Press and release the **Y** key.
2. The "Hi" message will be displayed followed by the maximum temperature recorded.
3. By pressing the **Y** key again or by waiting 5s the normal display will be restored.

5.3 HOW TO RESET THE MAX AND MIN TEMPERATURE RECORDED

1. Hold press the SET key for more than 3s, while the max. or min temperature is displayed. (rSt message will be displayed)
2. To confirm the operation the "rSt" message starts blinking and the normal temperature will be displayed.

6. MAIN FUNCTIONS

6.1 HOW TO SEE THE SETPOINT

- SET**
1. Push and immediately release the SET key: the display will show the Set point value;
 2. Push and immediately release the SET key or wait for 5 seconds to display the probe value again.

6.2 HOW TO CHANGE THE SETPOINT

1. Push the SET key for more than 2 seconds to change the Set point value;
2. The value of the set point will be displayed and the "°C" or "°F" LED starts blinking;
3. To change the Set value push the **Y** or **X** arrows within 10s.
4. To memorise the new set point value push the SET key again or wait 10s.

6.3 HOW TO START A MANUAL DEFROST

- Push the DEF key for more than 2 seconds and a manual defrost will start.

6.4 HOW TO CHANGE A PARAMETER VALUE

To change the parameter's value operate as follows:

1. Enter the Programming mode by pressing the Set + **X** keys for 3s (the "°C" or "°F" LED starts blinking).
2. Select the required parameter. Press the "SET" key to display its value
3. Use "UP" or "DOWN" to change its value.
4. Press "SET" to store the new value and move to the following parameter.

To exit: Press SET + UP or wait 15s without pressing a key.

NOTE: the set value is stored even when the procedure is exited by waiting the time-out to expire.

6.5 THE HIDDEN MENU

The hidden menu Includes all the parameters of the instrument.

6.5.1 HOW TO ENTER THE HIDDEN MENU

1. Enter the Programming mode by pressing the Set + **X** keys for 3s (the "°C" or "°F" LED starts blinking).
2. Released the keys, then push again the Set+**X** keys for more than 7s. The Pr2 label will be displayed immediately followed from the HY parameter.

NOW YOU ARE IN THE HIDDEN MENU.

3. Select the required parameter.
4. Press the "SET" key to display its value
5. Use **Y #** or **X** to change its value.
6. Press "SET" to store the new value and move to the following parameter.

To exit: Press SET + **Y #** or wait 15s without pressing a key.

NOTE1: if none parameter is present in Pr1, after 3s the "noP" message is displayed. Keep the keys pushed till the Pr2 message is displayed.

NOTE2: the set value is stored even when the procedure is exited by waiting the time-out to expire.

6.5.2 HOW TO MOVE A PARAMETER FROM THE HIDDEN MENU TO THE FIRST LEVEL AND VICEVERSA.

Each parameter present in the HIDDEN MENU can be removed or put into "THE FIRST LEVEL" (user level) by pressing "SET + **X**".

In HIDDEN MENU when a parameter is present in First Level the decimal point is on.

6.6 HOW TO LOCK THE KEYBOARD

1. Keep pressed for more than 3 s the UP + DOWN keys.
2. The "POF" message will be displayed and the keyboard will be locked. At this point it will be possible only to see the set point or the MAX o Min temperature stored
3. If a key is pressed more than 3s the "POF" message will be displayed.

6.7 TO UNLOCK THE KEYBOARD

Keep pressed together for more than 3s the **Y #** and **X** keys, till the "Pon" message will be displayed.

6.8 THE CONTINUOUS CYCLE

When defrost is not in progress, it can be activated by holding the "Y" key pressed for about 3 seconds. The compressor operates to maintain the "ccS" set point for the time set through the "CC" parameter. The cycle can be terminated before the end of the set time using the same activation key "Y" for 3 seconds.

6.9 THE ON/OFF FUNCTION

With "onF = oFF", pushing the ON/OFF key, the instrument is switched off. The "OFF" message is displayed. In this configuration, the regulation is disabled.



To switch the instrument on, push again the ON/OFF key.

WARNING: Loads connected to the normally closed contacts of the relays are always supplied and under voltage, even if the instrument is in stand by mode.

7. PARAMETERS

REGULATION

Hy Differential: (0,1 ÷ 25,5°C / 1÷255 °F) Intervention differential for set point. Compressor Cut IN is Set Point + differential (Hy). Compressor Cut OUT is when the temperature reaches the set point.

LS Minimum set point: (-50°C÷SET/-58°F÷SET): Sets the minimum value for the set point.

US Maximum set point: (SET÷110°C/ SET÷230°F). Set the maximum value for set point.

Ot Thermostat probe calibration: (-12,0÷12,0°C; -120÷120°F) allows to adjust possible offset of the thermostat probe.

P3P Third probe presence (P3): n= not present; the terminal operates as digital input; y= present; the terminal operates as third probe.

O3 Third probe calibration (P3): (-12,0÷12,0°C; -120÷120°F). allows to adjust possible offset of the third probe.

P4P Fourth probe presence: (n = Not present; y = present).

o4 Fourth probe calibration: (-12,0÷12,0°C) allows to adjust possible offset of the fourth probe.

Ods Outputs activation delay at start up: (0÷255min) This function is enabled at the initial start up of the instrument and inhibits any output activation for the period of time set in the parameter.

AC Anti-short cycle delay: (0÷50 min) minimum interval between the compressor stop and the following restart.

CCt Compressor ON time during continuous cycle: (0,0÷24,0h; res. 10min) Allows to set the length of the continuous cycle: compressor stays on without interruption for the CCt time. Can be used, for instance, when the room is filled with new products.

CCS Set point for continuous cycle: (-50÷150°C) it sets the set point used during the continuous cycle.

COOn Compressor ON time with faulty probe: (0÷255 min) time during which the compressor is active in case of faulty thermostat probe. With COOn=0 compressor is always OFF.

COF Compressor OFF time with faulty probe: (0÷255 min) time during which the compressor is OFF in case of faulty thermostat probe. With COF=0 compressor is always active.

CH Type of action: CL = cooling; Ht = heating.

DISPLAY

CF Temperature measurement unit: °C=Celsius; °F=Fahrenheit. **WARNING:** When the measurement unit is changed the SET point and the values of the parameters Hy, LS, US, Ot, ALU and ALL have to be checked and modified if necessary).

rES Resolution (for °C): (in = 1°C; dE = 0.1°C) allows decimal point display.

dLy Display delay: (0 ÷20,0m; risul. 10s) when the temperature increases, the display is updated of 1 °C/1°F after this time.

DEFROST

ldF Interval between defrost cycles: (0÷120h) Determines the time interval between the beginning of two defrost cycles.

MdF (Maximum) length for defrost: (0÷255min) When P2P = n, (not evaporator probe: timed defrost) it sets the defrost duration, when P2P = y (defrost end based on temperature) it sets the maximum length for defrost.

dFd Temperature displayed during defrost: (rt = real temperature; it = temperature at defrost start; SET = set point; dEF = "dEF" label)

dAd MAX display delay after defrost: (0÷255min). Sets the maximum time between the end of defrost and the restarting of the real room temperature display.

ALARMS

ALC Temperature alarms configuration: (Ab; rE)

Ab= absolute temperature: alarm temperature is given by the ALL or ALU values. rE = temperature alarms are referred to the set point. Temperature alarm is enabled when the temperature exceeds the "SET+ALU" or "SET-ALL" values.

ALU MAXIMUM temperature alarm: (SET÷110°C; SET÷230°F) when this temperature is reached the alarm is enabled, after the "ALd" delay time.

ALL Minimum temperature alarm: (-50,0 ÷ SET°C; -58÷230°F) when this temperature is reached the alarm is enabled, after the "ALd" delay time.

AFH Differential for temperature alarm recovery: (0,1÷25,5°C; 1÷45°F) Intervention differential for recovery of temperature alarm.

ALd Temperature alarm delay: (0÷255 min) time interval between the detection of an alarm condition and alarm signalling.

dAO Exclusion of temperature alarm at startup: (from 0.0 min to 23.5h) time interval between the detection of the temperature alarm condition after instrument power on and alarm signalling.

CONDENSER TEMPERATURE ALARM (detected by the fourth probe)

AP2 Probe selection for temperature alarm of condenser: nP = no probe; P1 = thermostat probe; P2 = evaporator probe; P3 =configurable probe; P4 = Probe on Hot Key plug.

AL2 Low temperature alarm of condenser: (-55÷150°C) when this temperature is reached the LA2 alarm is signalled, possibly after the Ad2 delay.

Au2 High temperature alarm of condenser: (-55÷150°C) when this temperature is reached the HA2 alarm is signalled, possibly after the Ad2 delay.

AH2 Differential for temperature condenser alarm recovery: (0,1÷25,5°C; 1÷45°F)

Ad2 Condenser temperature alarm delay: (0÷255 min) time interval between the detection of the condenser alarm condition and alarm signalling.

dA2 Condenser temperature alarm exclusion at start up: (from 0.0 min to 23.5h, res. 10min)

bLL Compressor off with low temperature alarm of condenser: n = no: compressor keeps on working; Y = yes, compressor is switched off till the alarm is present, in any case regulation restarts after AC time at minimum.

AC2 Compressor off with high temperature alarm of condenser: n = no: compressor keeps on working; Y = yes, compressor is switched off till the alarm is present, in any case regulation restarts after AC time at minimum.

SECOND RELAY

tbA Alarm relay silencing (with oA1=ALr):

(n= silencing disabled: alarm relay stays on till alarm condition lasts, y =silencing enabled: alarm relay is switched OFF by pressing a key during an alarm).

oA1 Second relay configuration: ALr: alarm; Lig: light; AuS: Auxiliary relay; onF: always on with instrument on; db = do not select it; dEF: do not select it!; FAn: do not select it!; dF2: do not select it.

AOp Alarm relay polarity: it set if the alarm relay is open or closed when an alarm happens. CL= terminals 1-2 closed during an alarm; oP = terminals 1-2 open during an alarm

DIGITAL INPUT

i1P Digital input polarity: oP: the digital input is activated by opening the contact; CL: the digital input is activated by closing the contact.

i1F Digital input configuration: EAL = external alarm: "EA" message is displayed; bAL = serious alarm "CA" message is displayed. PAL = pressure switch alarm, "CA" message is displayed; dor = door switch function; dEF = activation of a defrost cycle; AUS =to switch on the second relay if oA1 = AUS; Htr = kind of action inversion (cooling – heating); FAn = not set it; ES = Energy saving.

did: (0÷255 min) with i1F= EAL or i1F = bAL digital input alarm delay: delay between the detection of the external alarm condition and its signalling.

with i1F= dor: door open signalling delay

with i1F = PAL: time for pressure switch function: time interval to calculate the number of the pressure switch activation.

nPS Pressure switch number: (0 ÷15) Number of activation of the pressure switch, during the "did" interval, before signalling the alarm event (i2F= PAL).

If the nPS activation in the did time is reached, switch off and on the instrument to restart normal regulation.

odc Compressor status with door open: no, Fan = normal; CPR; F_C = Compressor OFF.

rrd Outputs restart after doA alarm: no = outputs not affected by the doA alarm; yES = outputs restart with the doA alarm;

HES Temperature increase during the Energy Saving cycle : (-30,0°C+30,0°C/-22÷86°F) it sets the increasing value of the set point during the Energy Saving cycle.

OTHER

Adr Serial address (1÷244): Identifies the instrument address when connected to a ModBUS compatible monitoring system.

PbC Type of probe: it allows to set the kind of probe used by the instrument: PbC = PBC probe, ntc = NTC probe.

onF on/off key enabling: nu = disabled; oFF = enabled; ES = not set it.

dP1 Thermostat probe display

dP3 Third probe display- optional.

dP4 Fourth probe display.

rSE Real set point: (readable only), it shows the set point used during the energy saving cycle or during the continuous cycle.

rEL Software release for internal use.

Ptb Parameter table code: readable only.

8. DIGITAL INPUT (ENABLED WITH P3P = N)

The free voltage digital input is programmable in different configurations by the "i1F" parameter.

8.1 DOOR SWITCH INPUT (i1F = dor)

It signals the door status and the corresponding relay output status through the "odc" parameter: no, Fan = normal (any change); CPR, F_C = Compressor OFF.

Since the door is opened, after the delay time set through parameter "did", the door alarm is enabled, the display shows the message "dA" and the regulation restarts is rtr = yES. The alarm stops as soon as the external digital input is disabled again. With the door open, the high and low temperature alarms are disabled.

8.2 GENERIC ALARM (i1F = EAL)

As soon as the digital input is activated the unit will wait for "did" time delay before signalling the "EAL" alarm message. The outputs status don't change. The alarm stops just after the digital input is de-activated.

8.3 SERIOUS ALARM MODE (i1F = bAL)

When the digital input is activated, the unit will wait for "did" delay before signalling the "CA" alarm message. The relay outputs are switched OFF. The alarm will stop as soon as the digital input is de-activated.

8.4 PRESSURE SWITCH (i1F = PAL)

If during the interval time set by "did" parameter, the pressure switch has reached the number of activation of the "nPS" parameter, the "CA" pressure alarm message will be displayed. The compressor and the regulation are stopped. When the digital input is ON the compressor is always OFF.

If the nPS activation in the did time is reached, switch off and on the instrument to restart normal regulation.

8.5 START DEFROST (i1F = dFr)

It starts a defrost if there are the right conditions. After the defrost is finished, the normal regulation will restart only if the digital input is disabled otherwise the instrument will wait until the "MdF" safety time is expired.

8.6 INVERSION OF THE KIND OF ACTION: HEATING-COOLING (i1F = Htr)

This function allows to invert the regulation of the controller: from cooling to heating and viceversa.

8.7 ENERGY SAVING (i1F = ES)

The Energy Saving function allows to change the set point value as the result of the SET+ HES (parameter) sum. This function is enabled until the digital input is activated.

8.8 DIGITAL INPUTS POLARITY

The digital input polarity depends on the "i1P" parameter.

i1P=CL: the input is activated by closing the contact.

i1P=OP: the input is activated by opening the contact

9. TTL SERIAL LINE – FOR MONITORING SYSTEMS

The TTL serial line, available through the HOT KEY connector, allows by means of the external TTL/RS485 converter, XJ485-CX, to connect the instrument to a monitoring system ModBUS-RTU compatible such as the X-WEB500/3000/300.

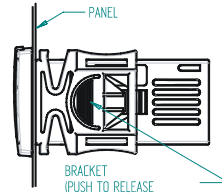
10. X-REP OUTPUT – OPTIONAL

As optional, an X-REP can be connected to the instrument, through the HOY KEY connector. The X-REP output **EXCLUDES** the serial connection.



To connect the X-REP to the instrument the following connectors must be used CAB-51F(1m), CAB-52F(2m), CAB-55F(5m),

11. INSTALLATION AND MOUNTING



Instrument XR30CX shall be mounted on vertical panel, in a 29x71 mm hole, and fixed using the special bracket supplied. The temperature range allowed for correct operation is 0÷60 °C. Avoid places subject to strong vibrations, corrosive gases, excessive dirt or humidity. The same recommendations apply to probes. Let air circulate by the cooling holes.

12. ELECTRICAL CONNECTIONS

The instrument is provided with screw terminal block to connect cables with a cross section up to 2,5 mm². Before connecting cables make sure the power supply complies with the instrument's requirements. Separate the probe cables from the power supply cables, from the outputs and the power connections. Do not exceed the maximum current allowed on each relay, in case of heavier loads use a suitable external relay.

12.1 PROBE CONNECTION

The probes shall be mounted with the bulb upwards to prevent damages due to casual liquid infiltration. It is recommended to place the thermostat probe away from air streams to correctly measure the average room temperature. Place the defrost termination probe among the evaporator fins in the coldest place, where most ice is formed, far from heaters or from the warmest place during defrost, to prevent premature defrost termination.

13. HOW TO USE THE HOT KEY

13.1 HOW TO PROGRAM A HOT KEY FROM THE INSTRUMENT (UPLOAD)

1. Program one controller with the front keypad.
2. When the controller is ON, insert the "Hot key" and push **Y** key; the "uPL" message appears followed a by flashing "End"
3. Push "SET" key and the End will stop flashing.
4. Turn OFF the instrument remove the "Hot Key", then turn it ON again.

NOTE: the "Err" message is displayed for failed programming. In this case push again **Y** key if you want to restart the upload again or remove the "Hot key" to abort the operation.

13.2 HOW TO PROGRAM AN INSTRUMENT USING A HOT KEY (DOWNLOAD)

1. Turn OFF the instrument.
2. Insert a programmed "Hot Key" into the 5 PIN receptacle and then turn the Controller ON.
3. Automatically the parameter list of the "Hot Key" is downloaded into the Controller memory, the "dOL" message is blinking followed a by flashing "End".
4. After 10 seconds the instrument will restart working with the new parameters.
5. Remove the "Hot Key"..

NOTE the message "Err" is displayed for failed programming. In this case turn the unit off and then on if you want to restart the download again or remove the "Hot key" to abort the operation.

14. ALARM SIGNALS

Message	Cause	Outputs
"P1"	Room probe failure	Compressor output acc. to par. "Con" and "COF"
"P3"	Third probe failure	Outputs unchanged
"P4"	Fourth probe failure	Outputs unchanged
"HA"	Maximum temperature alarm	Outputs unchanged.
"LA"	Minimum temperature alarm	Outputs unchanged.
"HA2"	Condenser high temperature	It depends on the "Ac2" parameter
"LA2"	Condenser low temperature	It depends on the "bLL" parameter
"dA"	Door open	Compressor according to rrd
"EA"	External alarm	Output unchanged.
"CA"	Serious external alarm (i1F=bAL)	All outputs OFF.
"CA"	Pressure switch alarm (i1F=PAL)	All outputs OFF

14.1 ALARM RECOVERY

Probe alarms P1", "P3" and "P4" start some seconds after the fault in the related probe; they automatically stop some seconds after the probe restarts normal operation. Check connections before replacing the probe.

Temperature alarms "HA", "LA" "HA2" and "LA2" automatically stop as soon as the temperature returns to normal values.

Alarms "EA" and "CA" (with i1F=bAL) recover as soon as the digital input is disabled.

Alarm "CA" (with i1F=PAL) recovers only by switching off and on the instrument.

14.2 OTHER MESSAGES

Pon	Keyboard unlocked.
PoF	Keyboard locked
noP	In programming mode: none parameter is present in P1 On the display or in dP2, dP3, dP4: the selected probe is nor enabled
noA	None alarm is recorded.

15. TECHNICAL DATA

Housing: self extinguishing ABS.

Case: XR30CX frontal 32x74 mm; depth 60mm;

Mounting: XR30CX panel mounting in a 71x29mm panel cut-out

Protection: IP20; Frontal protection: XR30CX IP65

Connections: Screw terminal block $\leq 2.5 \text{ mm}^2$ wiring.

Power supply: according to the model: 12Vac/dc, $\pm 10\%$; 24Vac/dc, $\pm 10\%$; 230Vac $\pm 10\%$, 50/60Hz, 110Vac $\pm 10\%$, 50/60Hz

Power absorption: 3VA max

Display: 3 digits, red LED, 14,2 mm high; Inputs: Up to 4 NTC or PTC probes.

Digital input: free voltage contact

Relay outputs: compressor SPST 8(3) A, 250Vac; or 20(8)A 250Vac

AUX: SPDT 8(3) A, 250Vac

Data storing: on the non-volatile memory (EEPROM).

Kind of action: 1B; Pollution grade: 2; Software class: A.;

Rated impulsive voltage: 2500V; Overvoltage Category: II

Operating temperature: $0 \div 60 \text{ }^\circ\text{C}$; Storage temperature: $-30 \div 85 \text{ }^\circ\text{C}$.

Relative humidity: $20 \div 85\%$ (no condensing)

Measuring and regulation range: NTC probe: $-40 \div 110 \text{ }^\circ\text{C}$ ($-40 \div 230 \text{ }^\circ\text{F}$);

PTC probe: $-50 \div 150 \text{ }^\circ\text{C}$ ($-58 \div 302 \text{ }^\circ\text{F}$)

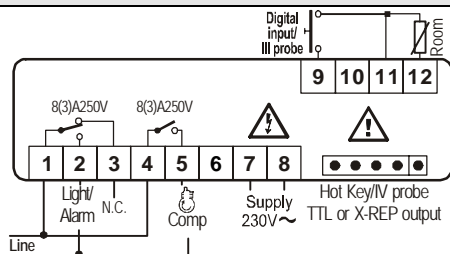
Resolution: $0,1 \text{ }^\circ\text{C}$ or $1 \text{ }^\circ\text{C}$ or $1 \text{ }^\circ\text{F}$ (selectable); Accuracy (ambient temp. $25 \text{ }^\circ\text{C}$): $\pm 0,7 \text{ }^\circ\text{C}$ ± 1 digit

16. CONNECTIONS

The X-REP output excludes the TTL output.. It's present in the following codes:

XR30CX- xx2xx, XR30CX -xx3xx;

16.1 XR30CX - 8A COMPRESSOR

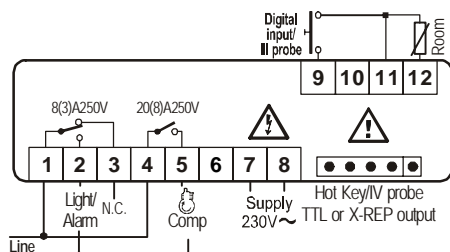


12Vac/dc supply: connect to the terminals 7 and 8.

24Vac/dc supply: connect to the terminals 7 and 8.

120Vac supply: connect to the terminals 7 and 8.

16.2 XR30CX - 20A COMPRESSOR



12Vac/dc supply: connect to the terminals 7 and 8.

24Vac/dc supply: connect to the terminals 7 and 8.

120Vac supply: connect to the terminals 7 and 8.

17. DEFAULT SETTING VALUES

Label	Name	Range	$^\circ\text{C}/^\circ\text{F}$	
Set	Set point	LS \div US	3.0	---
Hy	Differential	$0,1 \div 25,5 \text{ }^\circ\text{C} / 1 \div 255 \text{ }^\circ\text{F}$	2.0	Pr1
LS	Minimum set point	$-50 \text{ }^\circ\text{C} \div \text{SET} / -58 \text{ }^\circ\text{F} \div \text{SET}$	-50.0	Pr2
US	Maximum set point	$\text{SET} \div 110 \text{ }^\circ\text{C} / \text{SET} \div 230 \text{ }^\circ\text{F}$	110	Pr2
Ot	Thermostat probe calibration	$-12 \div 12 \text{ }^\circ\text{C} / -120 \div 120 \text{ }^\circ\text{F}$	0.0	Pr1
P3P	Third probe presence	n=not present; Y=pres.	n	Pr2
O3	Third probe calibration	$-12 \div 12 \text{ }^\circ\text{C} / -120 \div 120 \text{ }^\circ\text{F}$	0	Pr2
P4P	Fourth probe presence	n=not present; Y=pres.	n	Pr2
O4	Fourth probe calibration	$-12 \div 12 \text{ }^\circ\text{C} / -120 \div 120 \text{ }^\circ\text{F}$	0	Pr2
OdS	Outputs delay at start up	$0 \div 255 \text{ min}$	0	Pr2
AC	Anti-short cycle delay	$0 \div 50 \text{ min}$	1	Pr1
CCt	Continuous cycle duration	$0.0 \div 24.0 \text{ h}$	0.0	Pr2
CCS	Set point for continuous cycle	$(-55,0 \div 150,0 \text{ }^\circ\text{C}) (-67 \div 302 \text{ }^\circ\text{F})$	3	Pr2
CO n	Compressor ON time with faulty probe	$0 \div 255 \text{ min}$	15	Pr2
CO F	Compressor OFF time with faulty probe	$0 \div 255 \text{ min}$	30	Pr2
CH	Kind of action	CL=cooling; Ht= heating	cL	Pr1
CF	Temperature measurement unit	$^\circ\text{C} \div \text{ }^\circ\text{F}$	$^\circ\text{C}$	Pr2

	Resolution	in=integer; dE= dec.point	dE	Pr1
dLy	Display temperature delay	$0 \div 20,0 \text{ min}$ (10 sec.)	0	Pr2
IdF	Interval between defrost cycles	$1 \div 120 \text{ ore}$	8	Pr1
MdF	(Maximum) length for defrost	$0 \div 255 \text{ min}$	20	Pr1
dFd	Displaying during defrost	rt, it, SET, DEF	it	Pr2
dAd	MAX display delay after defrost	$0 \div 255 \text{ min}$	30	Pr2
ALc	Temperat. alarms configuration	rE= related to set; Ab = absolute	Ab	Pr2
ALU	MAXIMUM temperature alarm	Set= $110,0 \text{ }^\circ\text{C}$; Set= $230 \text{ }^\circ\text{F}$	110	Pr1
ALL	Minimum temperature alarm	$-50,0 \text{ }^\circ\text{C} \div \text{Set} / -58 \text{ }^\circ\text{F} \div \text{Set}$	-50.0	Pr1
AFH	Differential for temperat. alarm recovery	$(0,1 \text{ }^\circ\text{C} \div 25,5 \text{ }^\circ\text{C}) (1 \text{ }^\circ\text{F} \div 45 \text{ }^\circ\text{F})$	1	Pr2
AlD	Temperature alarm delay	$0 \div 255 \text{ min}$	15	Pr2
dAo	Delay of temperature alarm at start up	$0 \div 23 \text{ h } 50'$	1,3	Pr2
AP2	Probe for temperat. alarm of condenser	nP; P1; P2; P3; P4	P4	Pr2
AL2	Condenser for low temperat. alarm	$(-55 \div 150 \text{ }^\circ\text{C}) (-67 \div 302 \text{ }^\circ\text{F})$	-40	Pr2
AU2	Condenser for high temperat. alarm	$(-55 \div 150 \text{ }^\circ\text{C}) (-67 \div 302 \text{ }^\circ\text{F})$	110	Pr2
AH2	Differ. for condenser temp. alarm recovery	$[0,1 \text{ }^\circ\text{C} \div 25,5 \text{ }^\circ\text{C}] [1 \text{ }^\circ\text{F} \div 45 \text{ }^\circ\text{F}]$	5	Pr2
Ad2	Condenser temperature alarm delay	$0 \div 254 \text{ (min.)}, 255=nU$	15	Pr2
da2	Delay of cond. temper. alarm at start up	$0,0 \div 23 \text{ h } 50'$	1,3	Pr2
bLL	Compr. off for condenser low temperature alarm	n(0) - Y(1)	n	Pr2
AC2	Compr. off for condenser high temperature alarm	n(0) - Y(1)	n	Pr2
tbA	Alarm relay disabling	n=no; y=yes	y	Pr2
oA1	2 nd relay configuration	ALr = alarm; dEF = do not select it; Lig =Light; AUS =AUX; onF=always on; Fan= do not select it; db = do not select it; dF2 = do not select it	Lig	Pr2
AoP	Alarm relay polarity (oA1=ALr)	oP; cL	cL	Pr2
i1P	Digital input polarity	oP=opening; CL=closing	cL	Pr1
i1F	Digital input configuration	EAL, bAL, PAL, dor; dEF; Htr, AUS	dor	Pr1
did	Digital input alarm delay	$0 \div 255 \text{ min}$	15	Pr1
nPS	Number of activation of pressure switch	$0 \div 15$	15	Pr2
odc	Compress status when open door	no; Fan; CPR; F_C	no	Pr2
rrd	Regulation restart with door open alarm	n - Y	y	Pr2
HES	Differential for Energy Saving	$(-30 \text{ }^\circ\text{C} \div 30 \text{ }^\circ\text{C}) (-54 \text{ }^\circ\text{F} \div 54 \text{ }^\circ\text{F})$	0	Pr2
Adr	Serial address	$0 \div 247$	1	Pr2
PbC	Kind of probe	Ptc; ntc	ntc	Pr1
onF	on/off key enabling	nu, oFF; ES	nu	Pr2
dP1	Room probe display	--	--	Pr2
dP3	Third probe display	--	--	Pr1
dP4	Fourth probe display	--	--	Pr1
rSE	Real set point value	actual set	--	Pr2
rEL	Software release	--	--	Pr2
Ptb	Map code	--	--	Pr2

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Frigadon



Plug-in packaged
COOLING UNITS
Temperature range: +2 °C to +12 °C
Plug-in packaged or Split models
Wall or roof-top mounting
11 sizes: 0,5 to 11,0 kW



PACKAGED UNITS

MINICOOL/MIDICOOL/MAXICOOL/MEGACOO

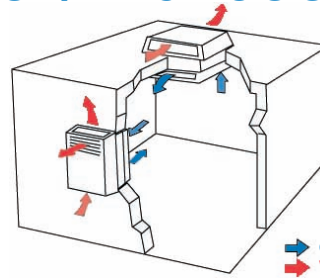
Frigadon packaged cooling units comprises condensing and evaporator sections in one piece and are at delivery "ready to run". Only electrical supply is needed.

Standard units are equipped with:

- Automatic drain-water disposal (only wall mounted)
- Micro processor, specially made for refrigeration units
- Temperature display with acoustic alarm for high and low temperature
- Pilot lamp alarm with reset button (not Minicool version)
- Start-, run and safety devices
- Summary alarm output circuit for H/L-pressure and compressor motor overload.

Standard units are wall mounted indoors. For mounting in outer wall choose weather protected (-V) model with following extra equipment:

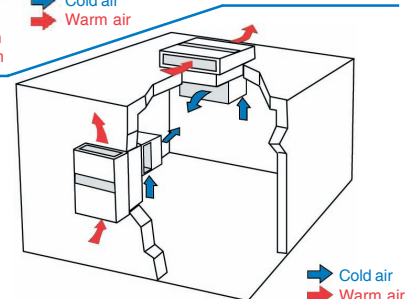
- Condenser pressure regulator
- Crankcase heater
- Weather protected front cover in UV-stabilized impact resistant grey plastic (only Minicool).



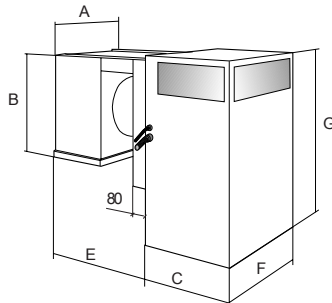
MINICOOL

Min. distance to roof or floor 200 mm
Min. distance to wall or door 100 mm

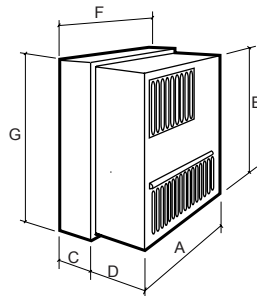
MINICOOL-15-E
MINICOOL-20-E
MIDICOOL
MAXICOOL
MEGACOO



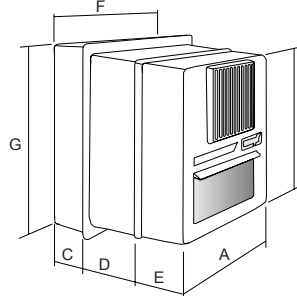
Min. distance to roof or floor 200 mm
Min. distance to wall or door 100 mm



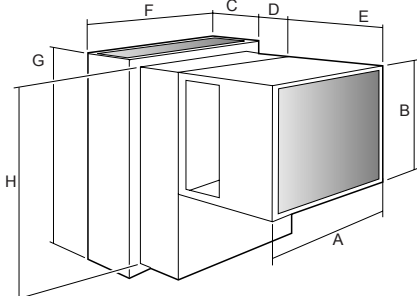
Minicool-15-E/Minicool-20-E



Minicool-5/Minicool-10



Minicool-20



Midicool/Maxicool/Megacool

Technical Data - Cooling Unit - Packaged

		MINICOOL		MINICOOL			MIDICOOL		MAXICOOL		MEGACOO	
		15-E	20-E	5	10	20	30	40	50	70	90	110
Mains supply	Volt/Ph/Hz	230/1/50		230/1/50			400/3N/50		400/3N/50		400/3N/50	
Fuse	A, Slow	10	10	10	10	10	10	16	16	16	25	25
Max. power consumption	kW	0.93	1.65	0.35	0.65	1.65	1.81	2.37	3.02	4.00	5.15	6.45
Nominal power consumption ¹⁾	kW	0.77	1.06	0.25	0.45	1.10	1.41	1.93	2.40	3.35	4.40	5.31
Cooling cap. ²⁾ T ₂ =-10 °C	kW	1.15	1.70	0.35	0.65	1.70	2.40	3.10	3.55	5.00	6.90	8.14
Cooling cap. ²⁾ T ₂ =-5 °C	kW	1.45	2.10	0.45	0.85	2.10	3.15	4.00	4.95	6.75	9.05	10.85
Cooling cap. ³⁾ T ₂ =-10 °C	kW	1.00	1.50	0.30	0.60	1.50	2.20	2.82	3.15	4.50	6.25	7.25
Cooling cap. ³⁾ T ₂ =-5 °C	kW	1.30	1.90	0.40	0.80	2.00	2.95	3.75	4.45	6.10	8.30	9.85
Refrigerant	type	R-404A		R-404A			R-404A		R-404A		R-404A	
Refrigerant charge	kg	1.60	1.60	0.19	0.27	0.80	1.60	1.70	4.00	4.50	9.00	9.50
Sound level ⁴⁾	dB(A)	58	58	52	55	58	65	67	69	70	72	74
Air flow evaporator	m ³ /s	0.22	0.35	0.09	0.17	0.25	0.42	0.61	0.75	1.05	1.45	1.95
Dimension A	mm	450	450	535	535	600	650	650	870	870	1470	1470
Dimension B	mm	500	500	635	635	700	590	590	730	730	730	730
Dimension C	mm	360	360	70	100	170	340	340	390	390	390	390
Dimension D	mm	-	-	210	210	250	290	290	390	390	390	390
Dimension E	mm	500	500	-	-	180	540	540	720	720	720	720
Dimension F	mm	505	505	595	650	650	750	750	975	975	1575	1575
Dimension G	mm	755	755	695	750	750	1095	1095	1190	1190	1290	1290
Dimension H	mm	-	-	-	-	-	995	995	1090	1090	1190	1190
Mounting hole size width	mm	460	460	545	545	610	675	675	895	895	1495	1495
Mounting hole size height	mm	510	510	645	645	710	1020	1020	1110	1110	1210	1210
Max. thickness of wall/roof	mm	100/100	100/100	210/130	210/130	430/250	300/300	300/300	400/400	400/400	400/400	400/400
Net weight	kg	75	75	32	45	70	135	140	230	240	380	390
Suitable room size at +4°C ⁵⁾	m ³	18	30	4	6	18	46	70	100	120	230	330
Suitable room size at +10°C ⁵⁾	m ³	30	48	6	18	48	75	105	128	238	345	405

1) Nominal capacity at T₂=-5 °C, T₁=+40 °C and T_{amb}=+27 °C.

2) Cooling capacity at T₁=+40 °C and T_{amb}=+27 °C. T_{room}-T₂= 10 °C.

3) Cooling capacity at T₁=+45 °C and T_{amb}=+32 °C. T_{room}-T₂= 10 °C.

4) Sound level at 1 meter distance at condenser side.

5) Suitable room size at T_{amb}=+27 °C, U-value 0.40 W/°C/m² and compressor run time=18 h/24h. T_{amb}=+32 °C => Volume x 0.65.