

Programmable Controller Operations Guide



Carel® PJEZ Platform



Carel® ir33 Platform



Carel® iJF Platform



**Dixell® XM670K-XM679K
Platform**

This guide is applicable to both refrigerated and heated cases. For proper applicability, determine the make and model of your case's programmable controller. Then access its operational information in this guide.

P/N 21-28910

Structural Concepts®

DELIVERING FRESH. ALWAYS.™

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CAREL



Carel® PJEZ Platform

Carel® PJEZ Programmable Controllers For Refrigerated & Heated Cases

CAREL

PJEZ* Platform

Electronic Digital Thermostat
With Defrost Control



Programming The Instrument

To Modify Defrost, Differential and Other Parameters

-  1. Press/hold "Set" key (numbers will begin flashing). Then, after 5 seconds, "PS" (password prompt) will appear.
-  2. After "PS" (password prompt) appears, release "Set" key and then press it again.
-  3. Press ▲ until password "22" is reached.
-  4. Press "Set" key to confirm password.
-   5. Press ▲ or ▼ to reach category to modify.
-  6. Press "Set" key to modify selected parameter.
-   7. Increase or decrease the value using the ▲ or ▼ keys respectively.
-  8. Press "Set" key to temporarily save the new value and return to the parameter display.
-  9. Press/hold "Set" key for 5 seconds to save changes. This will also mute the audible alarm (buzzer) and deactivate the alarm relay.
-  10. Changing set point: Press/hold "Set" key until set point numbers flash on screen. Then, press ▲ or ▼ until reaching desired number. Then, press "Set" again to retain settings.
-  11. Activating manual defrost: Press and hold "Def" key for at least 5 seconds. Display will alternate temperature and df (defrost). Release "Def" key and manual defrost will be activated.

How To Change Reading From Fahrenheit (°F) To Celsius (°C)

-  1. Press/hold "Set" (numbers will begin flashing). Then, after 5 seconds, "PS" (password prompt) will appear.
-  2. After "PS" (password prompt) appears, release "Set" and then press it again.
-  3. Press ▲ until password "22" is reached.
-  4. Press "Set" to confirm password.
-   5. Press ▲ or ▼ until reaching the parameter "/ 5."
-  6. Press "SET" to modify selected parameter.
-   7. Press ▲ or ▼ to change value to desired setting: "0" for Celsius (°C) or "1" for Fahrenheit (°F).
-  8. Press "SET" key to temporarily save the new value and return to parameter display.
-  9. Press & hold "Set" key for 5 full seconds to save changes.

Warning! Save Your Parameter Settings!

- A. All modifications made to parameters will be lost if you do NOT press a button within 60 seconds. Should this "timeout" occur, normal operational settings (prior to modifications being made) will resume.
- B. If the instrument is switched off before pressing and holding "Set" key (for 5 seconds), all modifications to parameters will be lost.

CAREL

PJEZ* Platform

Electronic Digital Thermostat
With Defrost Control



User Interface - Display

Category	Icon
Compressor parameters	
Defrost parameters	
Alarm parameters	

Summary Table of Alarm and Signals: Display, Buzzer and Relay

Alarm Code	Buzzer and Alarm Relay	LED	Alarm Description	Reset	ENABLE ALARM Parameters Involved
E0	Active	ON	Probe 1 Error = Control	Automatic	-
E1	Not Active	ON	Probe 2 Error = Defrost	Automatic	D0 = 0 / 1 / 4, F0 = 1
E2	Not Active	ON	Probe 3 Error = Condenser/Product	Automatic	A4 = 10/11

Summary Table of Operating Parameters

Code	Parameter	UOM**	Min.	Max.	Default	Available on Heated Units?
/5	Select Celsius (°C) or Fahrenheit (°F)	-	0	1	For Case Specific Defaults See Serial Label Located Near Electrical Access On Your Case.	Yes
/P	Probe type selection	-	0	2		Yes
/c1	Probe 1 offset	°C/°F	-50	50		Yes
/c2	Probe 2 offset	°C/°F	-50	50		Yes
St	Temperature set point	°C/°F	r1	r2		Yes
rd	Control differential	°C/°F	0	19		Yes
r1	Minimum set point value	°C/°F	-50	50		Yes
r2	Maximum set point value	°C/°F	30	284		Yes
c2	Minimum compressor off time	min	0	100		Yes
c3	Minimum compressor on time	min	0	100		Yes
d0	Type of defrost	-	0	4	For Additional Technical Information Call Structural Concepts Technical Service Dept. at 1(800) 433-9490 Ext. 1	Yes
dI	Interval between defrosts	hours	0	199		No
d4	Defrost when switching instrument on***	-	0	1		No
dt	End defrost temperature, evaporator	°C/°F	-50	130		No
dP	Maximum defrost duration, evaporator	Min	1	199		No
d6	Freeze control temp. display during defrost	-	0	1		No
dd	Dripping time after defrost	min	0	15		No
d/	Display of defrost probe 1	°C/°F	-	-		No

*See PJEZ model and data specifics on page 1 of this document. ||| **Unit of Measure

***Case will go into defrost ONLY when turned off and then back on when probe is reading below 45 °F (4.2 °C).

CAREL



Carel® ir33 Platform

Carel® ir33 Platform Programmable Controllers For Refrigerated Cases

CAREL**ir33 platform**Integrated Electronic
Microprocessor Controller

Programming The Instrument

To Modify Defrost, Differential and Other Parameters

Prg
mute**Set**

1. Press & hold "Prg" & "SET" keys together for at least five (5) seconds; display will flash "0," representing password prompt.

▲
aux

2. Press ▲ until password "22" is reached.

Set

3. Press "SET" key to confirm password.

▲
aux**def**
▼

4. Press ▲ or ▼ to reach a category to be modified.

Set

5. Press "SET" to modify selected parameter.

▲
aux**def**
▼

6. Increase or decrease the value using the ▲ or ▼ button respectively.

Set

7. Press the "SET" key to temporarily save the new value and return to the parameter display.

Prg
mute

8. Press & hold the "Prg" key for 5 full seconds to save changes. This will also mute the audible alarm (buzzer) and deactivate the alarm relay.

Warning! Save Your Parameter Settings!

1. To store the new parameter values, PRESS and HOLD the "Prg" key for at least 5 seconds.
2. All modifications made to parameters will be lost if you do NOT press a button within 60 seconds. Should this "timeout" occur, normal operational settings (prior to modifications being made) will resume.
3. If the instrument is switched off before pressing the "Prg" key, all modifications to parameters will be lost.

To Activate Manual Defrost

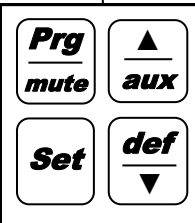
def
▼

Press and hold "def" key for at least 5 seconds.

To Activate / Deactivate Auxiliary Output

▲
aux

Press and hold the "aux" key for 1 second.



How To Change Reading From Fahrenheit (°F) To Celsius (°C)

Prg
mute**Set**

1. Press and hold "Prg" and "SET" keys together for at least 5 seconds; display will show "0" (password prompt).

▲
aux

2. Press ▲ until password "22" is reached.

Set

3. Confirm by pressing "SET" key.

▲
aux**def**
▼

4. Press ▲ or ▼ until reaching the parameter "/ 5."

Set

5. Press "SET" to modify this selected parameter.

▲
aux**def**
▼

6. Press ▲ or ▼ to change value to desired setting: "0" for Celsius (°C) or "1" for Fahrenheit (°F).

Set

7. Press "SET" key to temporarily save the new value and return to the display of the parameter.

Prg
mute

8. Press & hold "Prg" key for 5 full seconds to save changes. **Note! All values will automatically convert to new scale. No conversion is required.**

To Reset Any Alarms With Manual Reset

Prg
mute▲
aux

Press and hold the "Prg" and "aux" key for at least 1 second.

This data derived from Carel® Controller Material:
ir33 +030220441 - rel. 2.0 - 01.05.2006.
User Manuals\Carel ir33 Platform Programmable Controller For
Refrig Units - Rev C Date: 06/22/2022

CAREL**ir33 platform**Integrated Electronic
Microprocessor Controller**User Interface - Display**

ICON	FUNCTION	DESCRIPTION	ON	Normal operation OFF	BLINK	Start up
	COMPRESSOR	ON when the compressor starts. Flashes when the activation of the compressor is delayed by safety times.	Compressor on	Compressor off	awaiting activation	
	FAN	ON when the fan starts. Flashes when the activation of the fan is prevented due to external disabling or procedures in progress.	Fan on	Fan off	awaiting activation	
	DEFROST	ON when the defrost is activated. Flashes when the activation of the defrost is prevented due to external disabling or procedures in progress.	Defrost in progress	Defrost not in progress	awaiting activation	
	AUX	Flashes if the anti-sweat heater function is active, ON when the auxiliary output (1 and/or 2) selected as AUX (or LIGHT in firmware version 3.6) is activated.	AUX auxiliary output active (version 3.6 light auxiliary output active)	AUX auxiliary output not active	Anti-sweat heater function active	
	ALARM	ON following pre-activation of the delayed external digital input alarm. Flashes in the event of alarms during normal operation (e.g. high/low temperature) or in the event of alarms from an immediate or delayed external digital input.	Delayed external alarm (before the time 'A7' elapses)	No alarm present	Alarms in norm. operation (e.g. High/low temperature) or immediate or delayed alarm from external digital input	
	CLOCK	ON if at least one timed defrost has been set. At start-up, comes ON for a few seconds to indicate that the Real Time Clock is fitted.	If at least 1 timed defrost event has been set	No timed defrost event set	Alarm clock	ON if real-time clock present
	LIGHT	Flashes if the anti-sweat heater function is active, ON when the auxiliary output (1 and/or 2) selected as LIGHT is activated (in firmware version 3.6 it does not flash in anti-sweat heater mode and comes on when the dead band output is active).	Light auxiliary output on (version 3.6 dead band auxiliary output active)	Light auxiliary output off	Anti-sweat heater function active (version 3.6 does not flash in anti-sweat heater mode)	
	SERVICE	Flashes in the event of malfunctions, for example E2PROM errors or probe faults.		No malfunction	Malfunction (e.g. E2PROM error or probe fault). Contact service	
	CONTINUOUS CYCLE	ON when the CONTINUOUS CYCLE function is activated. Flashes if the activation of the function is prevented due to external disabling or procedures in progress (E.g.: minimum compressor OFF time).	CONTINUOUS CYCLE operation activated	CONTINUOUS CYCLE function not activated	CONTINUOUS CYCLE operation requested	

Summary Table of Alarm and Signals: Display, Buzzer and Relay

Code	Icon on the display	Alarm relay	Buzzer	Reset	Description
rE	flashing	on	on	automatic	virtual control probe fault
E0	flashing	off	off	automatic	room probe S1 fault
E1	flashing	off	off	automatic	defrost probe S2 fault
E2	flashing	off	off	automatic	probe S3 fault
E3	flashing	off	off	automatic	probe S4 fault
E4	flashing	off	off	automatic	probe S5 fault
'	No	off	off	automatic	probe not enabled
LO	flashing	on	on	automatic	low temperature alarm
HI	flashing	on	on	automatic	high temperature alarm
AFr	flashing	on	on	manual	antifreeze alarm
IA	flashing	on	on	automatic	immediate alarm from external contact
dA	flashing	on	on	automatic	delayed alarm from external contact
dEF	on	off	off	automatic	defrost running
Ed1	No	off	off	automatic/manual	defrost on evaporator 1 ended by timeout
Ed2	No	off	off	automatic/manual	defrost on evaporator 2 ended by timeout
Pd	flashing	on	on	automatic/manual	maximum pump down time alarm
LP	flashing	on	on	automatic/manual	low pressure alarm
AtS	flashing	on	on	automatic/manual	autostart in pump down
cht	No	off	off	automatic/manual	high condenser temperature pre-alarm
CHT	flashing	on	on	manual	high condenser temperature alarm
dor	flashing	on	on	automatic	door open too long alarm
EE	flashing	off	off	automatic	E2prom error, unit parameters
EF	flashing	off	off	automatic	E2prom error, operating parameters
ccb	Signal				start continuous cycle request
ccE	Signal				end continuous cycle request
dFb	Signal				start defrost call
dFE	Signal				end defrost call
On	Signal				switch ON
off	Signal				switch OFF
rES	Signal				reset alarms w/manual reset / reset HACCP alarms / reset temp. monitoring.

This data derived from Carel® Controller Material:
ir33 +030220441 - rel. 2.0 - 01.05.2006.
User Manuals\Carel ir33 Platform Programmable Controller For
Refrig Units - Rev C Date: 06/22/2022

CAREL**ir33 platform**Integrated Electronic
Microprocessor Controller

Summary Table of Operating Parameters

CODE	PARAMETER	UOM*	TYPE	MINIMUM	MAXIMUM	DEFAULT
/5	Select Celsius (°C) or Fahrenheit (°F)	flag	C	0	1	For Case Specific Defaults See Serial Label Located Near Electrical Access On Your Case. For Additional Technical Information Call Structural Concepts Technical Service Dept. at 1(800) 433.9490 Ext. 1
/c1	Calibration of probe 1	°C/°F	C	-20	20	
/c2	Calibration of probe 2	°C/°F	C	-20	20	
St	Temperature set point	°C/°F	F	r2	r1	
rd	Control delta	°C/°F	F	20	0.1	
dl	Interval between defrosts	hours	F	0	250	
d4	Defrost activated when instrument is switched on**	-	-	0	1	
dt1	End defrost temperature, evaporator	°C/°F	F	-50	200	
dP1	Maximum defrost duration, evaporator	min	F	1	250	
d6	Display on hold during defrost	-	C	0	2	
dd	Dripping time after defrost	min	F	0	15	
d/1	Display of defrost probe 1	°C/°F	F	-	-	

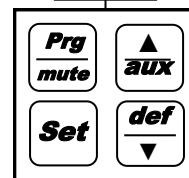
* Unit Of Measure

** Case will go into defrost ONLY when case is turned off and then back on when probe is reading below 45 °F.

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CAREL**ir33 platform**Integrated Electronic
Microprocessor Controller

Changing "Meat & Dairy" and "Produce" Setpoints Using The Electronic Controller



To Increase or Decrease the Value of the "Meat & Dairy" Temperature Setting:

1. Press & hold "Prg" & "SET" keys together for 5 seconds; display will flash "0", representing the password prompt.
2. Press ▲ until password "22" is reached.
3. Press "SET" key to confirm password.
4. Press ▲ or ▼ to reach the "r4" parameter.
5. Press "SET" to access the "r4" parameter.
6. If you RAISE "Meat & Dairy" setpoint, you must LOWER ▼ the "r4" parameter the same number of degrees in which you RAISED setpoint.
Example: If you RAISE the "Meat & Dairy" setpoint from 11 °F to 12 °F, you must use the ▼ button to LOWER the "r4" parameter by 1 °F.
7. If you LOWER the "Meat & Dairy" setpoint, you must also RAISE ▲ the "r4" parameter the same number of degrees in which you LOWERED the setpoint.
Example: If you LOWER the "Meat & Dairy" setpoint from 15 °F to 14 °F, you must use the ▲ button to RAISE the "r4" parameter by 1 °F.
8. Press the "SET" key to temporarily save the new value and return to the parameter display.

Prg
mute

9. To store the new parameters values, Press and hold "Prg" key for at least 5 seconds. This action will mute the audible alarm (buzzer) and deactivate the alarm relay.

To Increase or Decrease the Value of the "Produce" Temperature Setting:

1. Press & hold "Prg" and "SET" keys together for 5 seconds; display will flash "0", representing the password prompt.
2. Press ▲ until password "22" is reached.
3. Press "SET" key to confirm password.
3. Press ▲ or ▼ to reach "r4" parameter.
4. Press "SET" to access the "r4" parameter.
5. To Increase or decrease temperature from the "Produce/Deli" setting, use the ▲ or ▼ button respectively.
6. Press the "SET" key to temporarily save the new value and return to parameter display.
7. To store the new parameter values, PRESS and HOLD the "Prg" key for at least 5 seconds. This action will mute the audible alarm (buzzer) and deactivate the alarm relay.

Prg
mute▲
aux

Set

▲
aux

Set

▲
aux

Set

Prg
mute

Warning! You Must Save Your Parameter Settings!

1. All modifications made to parameters will be lost if a button is not pressed within 60 seconds. Should this "timeout" occur, normal operational settings (prior to modifications being made) will resume.
2. If instrument is switched off before pressing the "Prg" key, all modifications to parameters will be lost.

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CAREL



Carel® ir33 Platform

Carel® ir33 Platform Programmable Controllers For Heated Cases

CAREL**ir33 platform**Integrated Electronic
Microprocessor Controller

Programming The Instrument

To Modify Differential and Other Parameters

Prg
mute**Set**

1. Press & hold "Prg" & "SET" keys together for at least five (5) seconds; display will flash "0," representing password prompt.

▲
aux

2. Press ▲ until password "22" is reached.

Set

3. Press "SET" key to confirm password.

▲
aux**def**
▼

4. Press ▲ or ▼ to reach a category to be modified.

Set

5. Press "SET" to modify selected parameter.

▲
aux**def**
▼

6. Increase or decrease the value using the ▲ or ▼ button respectively.

Set

7. Press the "SET" key to temporarily save the new value and return to the parameter display.

Prg
mute

8. Press & hold the "Prg" key for 5 full seconds to save changes. This will also mute the audible alarm (buzzer) and deactivate the alarm relay.

Warning! Save Your Parameter Settings!

1. To store the new parameter values, PRESS and HOLD the "Prg" key for at least 5 seconds.
2. All modifications made to parameters will be lost if you do NOT press a button within 60 seconds. Should this "timeout" occur, normal operational settings (prior to modifications being made) will resume.
3. If the instrument is switched off before pressing the "Prg" key, all modifications to parameters will be lost.

To Reset Any Alarms With Manual Reset

Prg
mute▲
aux

Press and hold the "Prg" and "aux" key for at least 1 second.

Prg
mute▲
aux**Set****def**
▼

How To Change Reading From Fahrenheit (°F) To Celsius (°C)

Prg
mute**Set**

1. Press and hold "Prg" and "SET" keys together for at least 5 seconds; display will show "0" (password prompt).

▲
aux

2. Press ▲ until password "22" is reached.

Set

3. Confirm by pressing "SET" key.

▲
aux**def**
▼

4. Press ▲ or ▼ until reaching the parameter "/ 5."

Set

5. Press "SET" to modify this selected parameter.

▲
aux**def**
▼

6. Press ▲ or ▼ to change value to desired setting: "0" for Celsius (°C) or "1" for Fahrenheit (°F).

Set

7. Press "SET" key to temporarily save the new value and return to the display of the parameter.

Prg
mute

8. Press & hold "Prg" key for 5 full seconds to save changes. **Note! All values will automatically convert to new scale. No conversion is required.**

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Unit Document ||| User Manuals\Carel ir33 Platform Programmable
Controller For Heated Units ||| Rev B Date: 06/22/2022

CAREL**ir33 platform**Integrated Electronic
Microprocessor Controller**User Interface - Display**

ICON	FUNCTION	DESCRIPTION	ON	Normal operation OFF	BLINK	Start up
	COMPRESSOR	ON when the compressor starts. Flashes when the activation of the compressor is delayed by safety times.	Compressor on	Compressor off	awaiting activation	
	FAN	ON when the fan starts. Flashes when the activation of the fan is prevented due to external disabling or procedures in progress.	Fan on	Fan off	awaiting activation	
	DEFROST	ON when the defrost is activated. Flashes when the activation of the defrost is prevented due to external disabling or procedures in progress.	Defrost in progress	Defrost not in progress	awaiting activation	
	AUX	Flashes if the anti-sweat heater function is active, ON when the auxiliary output (1 and/or 2) selected as AUX (or LIGHT in firmware version 3.6) is activated.	AUX auxiliary output active (version 3.6 light auxiliary output active)	AUX auxiliary output not active	Anti-sweat heater function active	
	ALARM	ON following pre-activation of the delayed external digital input alarm. Flashes in the event of alarms during normal operation (e.g. high/low temperature) or in the event of alarms from an immediate or delayed external digital input.	Delayed external alarm (before the time 'A7' elapses)	No alarm present	Alarms in norm. operation (e.g. High/low temperature) or immediate or delayed alarm from external digital input	
	CLOCK	ON if at least one timed defrost has been set. At start-up, comes ON for a few seconds to indicate that the Real Time Clock is fitted.	If at least 1 timed defrost event has been set	No timed defrost event set	Alarm clock	ON if real-time clock present
	LIGHT	Flashes if the anti-sweat heater function is active, ON when the auxiliary output (1 and/or 2) selected as LIGHT is activated (in firmware version 3.6 it does not flash in anti-sweat heater mode and comes on when the dead band output is active).	Light auxiliary output on (version 3.6 dead band auxiliary output active)	Light auxiliary output off	Anti-sweat heater function active (version 3.6 does not flash in anti-sweat heater mode)	
	SERVICE	Flashes in the event of malfunctions, for example E2PROM errors or probe faults.		No malfunction	Malfunction (e.g. E2PROM error or probe fault). Contact service	
	CONTINUOUS CYCLE	ON when the CONTINUOUS CYCLE function is activated. Flashes if the activation of the function is prevented due to external disabling or procedures in progress (E.g.: minimum compressor OFF time).	CONTINUOUS CYCLE operation activated	CONTINUOUS CYCLE function not activated	CONTINUOUS CYCLE operation requested	

Summary Table of Alarm and Signals: Display, Buzzer and Relay

Code	Icon on the display	Alarm relay	Buzzer	Reset	Description
rE	flashing	on	on	automatic	virtual control probe fault
E0	flashing	off	off	automatic	room probe S1 fault
E1	flashing	off	off	automatic	defrost probe S2 fault
E2	flashing	off	off	automatic	probe S3 fault
E3	flashing	off	off	automatic	probe S4 fault
E4	flashing	off	off	automatic	probe S5 fault
'	No	off	off	automatic	probe not enabled
LO	flashing	on	on	automatic	low temperature alarm
HI	flashing	on	on	automatic	high temperature alarm
AFr	flashing	on	on	manual	antifreeze alarm
IA	flashing	on	on	automatic	immediate alarm from external contact
dA	flashing	on	on	automatic	delayed alarm from external contact
dEF	on	off	off	automatic	defrost running
Ed1	No	off	off	automatic/manual	defrost on evaporator 1 ended by timeout
Ed2	No	off	off	automatic/manual	defrost on evaporator 2 ended by timeout
Pd	flashing	on	on	automatic/manual	maximum pump down time alarm
LP	flashing	on	on	automatic/manual	low pressure alarm
AtS	flashing	on	on	automatic/manual	autostart in pump down
cht	No	off	off	automatic/manual	high condenser temperature pre-alarm
CHT	flashing	on	on	manual	high condenser temperature alarm
dor	flashing	on	on	automatic	door open too long alarm
EE	flashing	off	off	automatic	E2prom error, unit parameters
EF	flashing	off	off	automatic	E2prom error, operating parameters
ccb	Signal				start continuous cycle request
ccE	Signal				end continuous cycle request
dFb	Signal				start defrost call
dFE	Signal				end defrost call
On	Signal				switch ON
off	Signal				switch OFF
rES	Signal				reset alarms w/manual reset / reset HACCP alarms / reset temp. monitoring

This data derived from Carel® Controller Material:
ir33 +030220441 - rel. 2.0 - 01.05.2006. Structural Concepts Heated Unit
Document ||| User Manuals\Carel ir33 Platform Programmable
Controller For Heated Units ||| Rev B Date: 06/22/2022

CAREL

ir33 platform

 Integrated Electronic
Microprocessor Controller


Summary Table of Operating Parameters

CODE	PARAMETER	UOM*	TYPE	MINIMUM	MAXIMUM	DEFAULT
/5	Select Celsius (°C) or Fahrenheit (°F)	flag	C	0	1	For Case Specific Defaults See Serial Label Located Near Electrical Access On Your Case. For Additional Technical Information Call Structural Concepts Technical Service Dept. at 1(800) 433.9490 Ext. 1
/c1	Calibration of probe 1	°C/°F	C	-20	20	
St	Temperature set point	°C/°F	F	r2	r1	
rd	Control delta	°C/°F	F	20	0.1	

* Unit Of Measure

 This data derived from Carel® Controller Material:
 ir33 +030220441 - rel. 2.0 - 01.05.2006. Structural Concepts Heated
 Unit Document ||| User Manuals\Carel ir33 Platform Programmable
 Controller For Heated Units ||| Rev B Date: 06/22/2022

CAREL



Carel® iJF Platform

Carel® iJF Platform Programmable Controllers For Heated Cases

1. Introduction

- The date provided herein is derived from Carel The CAREL Programmable Controller Material +0300010EN - rel. 1.0 - 10.05.2021 ||| SCC - Revision A Date: 1.19.2022.
- This user manual is applicable to the Carel iJF programmable controller and is applicable to Structural Concepts Corporation heated merchandisers only.
- See next page for programmable controller keypad.



2. Overview

- These Structural Concepts Reveal® heated cases are designed to hold pre-heated, perishable, packaged foods at 140 °F to 180 °F (60 °C to 82 °C).
- Cases should be installed and operated according to this operating manual's instructions to insure proper performance. Improper use will void warranty.
- Product must be pre-heated before placing in merchandiser. This case is NOT designed to heat product from cold or ambient condition.
- All heating elements are thermostat controlled for individual adjustment.
- Most units have controls to multiple heated areas.
- This can include decks (a.k.a. "wells"), overhead heaters and even heated shelves.

3. Powering Up Merchandiser

- After case has powered up, the unit will display the current user setting number that is held in memory.
- Values are stored whenever settings are changed.

4. Programmable Controller Limitations

- Case thermometer measures air temperature. It does NOT reflect actual shelf or product temperature.

5. Thermometers

- Thermometers in equipment reflect internal air temperature ONLY (not actual food temperature).
- Use ONLY probe thermometers to determine actual product temperatures (not infrared thermometers).



6. Terminal States

The possible states of the terminal are shown in the table below.



Status

Standby

Description

The display shows the main value, alternating with any alarms and signals



Status

Direct activation of loads and functions from the keypad

Description

The loads can be activated or deactivated and the direct functions accessed from the keypad



Status

Programming menu

Description

Scroll the programming menu using the arrow buttons

> Carel iJF Programmable Controller User Manual Continues on Next Page

7. Keypad Overview



Keypad

Icon/button	Description	On	Flashing
	Set point/Up arrow	Increase value Scroll menu	-
	Program	Pressed briefly: - enter menu branch - save value and return to the parameter code Pressed and held (3 s): - from standby, unlock keypad and enter programming mode - when scrolling, go to the previous parameter	-
	On-Off/Down arrow (DOWN)	- Unit ON - Decrease value - Scroll menu - Switch unit on/off	-
	Defrost	Active/stop	Awaiting/start
	Continuous cycle	Active/stop	Awaiting/start
	Lights	Active/stop	Activation
	HACCP	- HACCP alarms present - Direct access to HACCP menu	-
	Alarm log	- Logged alarms present - Direct access to the alarm log menu	-
	Auxiliary output	Active	-
	Compressor	Active	Awaiting
	Evaporator fan	Active	-
	Clock	Scheduler active	-
	°C	Unit of measure °C	-
	°F	Unit of measure °F	-
	Service Maintenance	Active alarms	-

ⓘ Notice: during navigation, the buttons will be on/flashing only if enabled.

- > **Note:** Not all icons shown above will be viewable on your controller nor applicable to your particular case.
- > Carel iJF Programmable Controller User Manual Continues on Next Page

8. Screen Navigation - User Settings

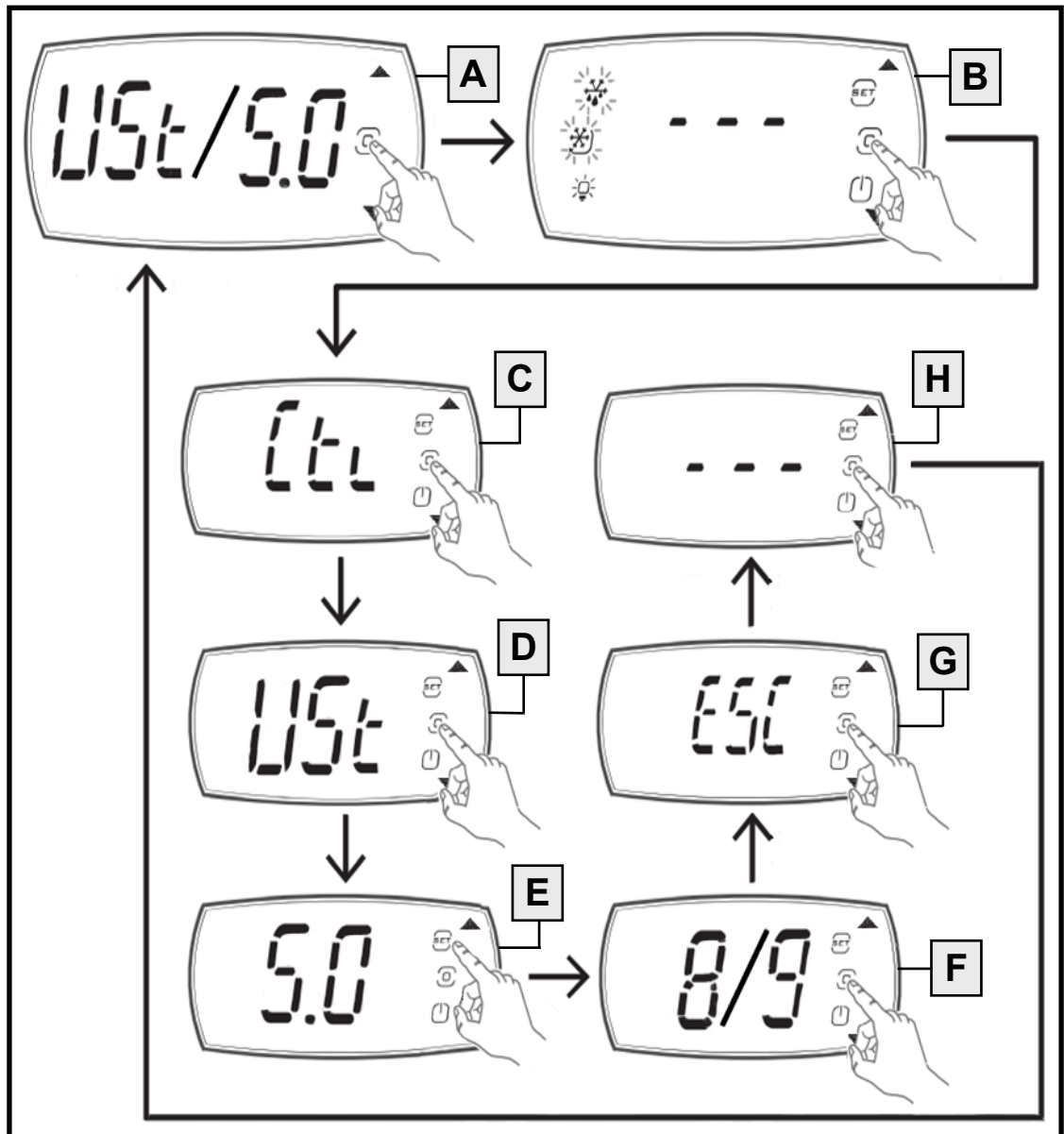
- The figures below show how to navigate between screens on the display for USER SETTINGS only.
 - Establishing USER SETTINGS are the MOST COMMON reason for needing to navigate the screen.
 - CAREL acronyms: "USt" = User Settings / "Ctl" = Control / "FSt" = Factory Settings / "ESC" = Escape / "dir" = Direct Functions / "PSd" = Password.
 - Note: These steps correspond with accompanying illustration.
- Default setting will alternately display USt (User Settings) and its temp. setting (1.0 to 9.0). Note: Illustration shows "USt/5.0" to convey that screen could be intermittently flashing "USt" and random number "5.0." To change the setting (and make case either warmer or cooler), press the Program icon once. The "- - -" will appear (see next step).
 - Press Program icon again ("Ctl" appears; shown next step).
 - "Ctl" (Control) will now appear on the screen. Press Program icon again to get to "USt" (user setting; shown in next step).
 - Press Program icon again for current setting to be displayed (that you wish to change); the EXISTING setting (a sample setting of "5.0" is shown at next step).
 - Sample setting of "5.0" is shown. Setpoint/Up and On-Off/Down arrow icon will be flashing. Change User Settings by pressing the Setpoint/Up arrow icon OR the On-Off/Down arrow icon to desired setting. Note: You may adjust setting from "1.0" (minimum heat) to "9.0" (maximum heat).

- A sample "8"/"9" setting is shown to depict random settings that may be chosen (for illustrative purposes only). After selecting desired setting, press the Program icon.
> Then press the On-Off/Down key to reach "ESC" (escape).
- When at the "ESC" screen, press the Program icon again to "lock in" the new temperature settings.
- The "---" image will appear again with several flashing icons at lower left and right.

> After approx. 5 seconds, the flashing icons will stop and the new flashing "USt/8" (or whatever User Setting have been selected) will alternately appear on the screen (as illustrated in step "A" of these instructions).

> User Settings have now been selected and locked.

> See next page for Screen Navigation - Factory Settings.



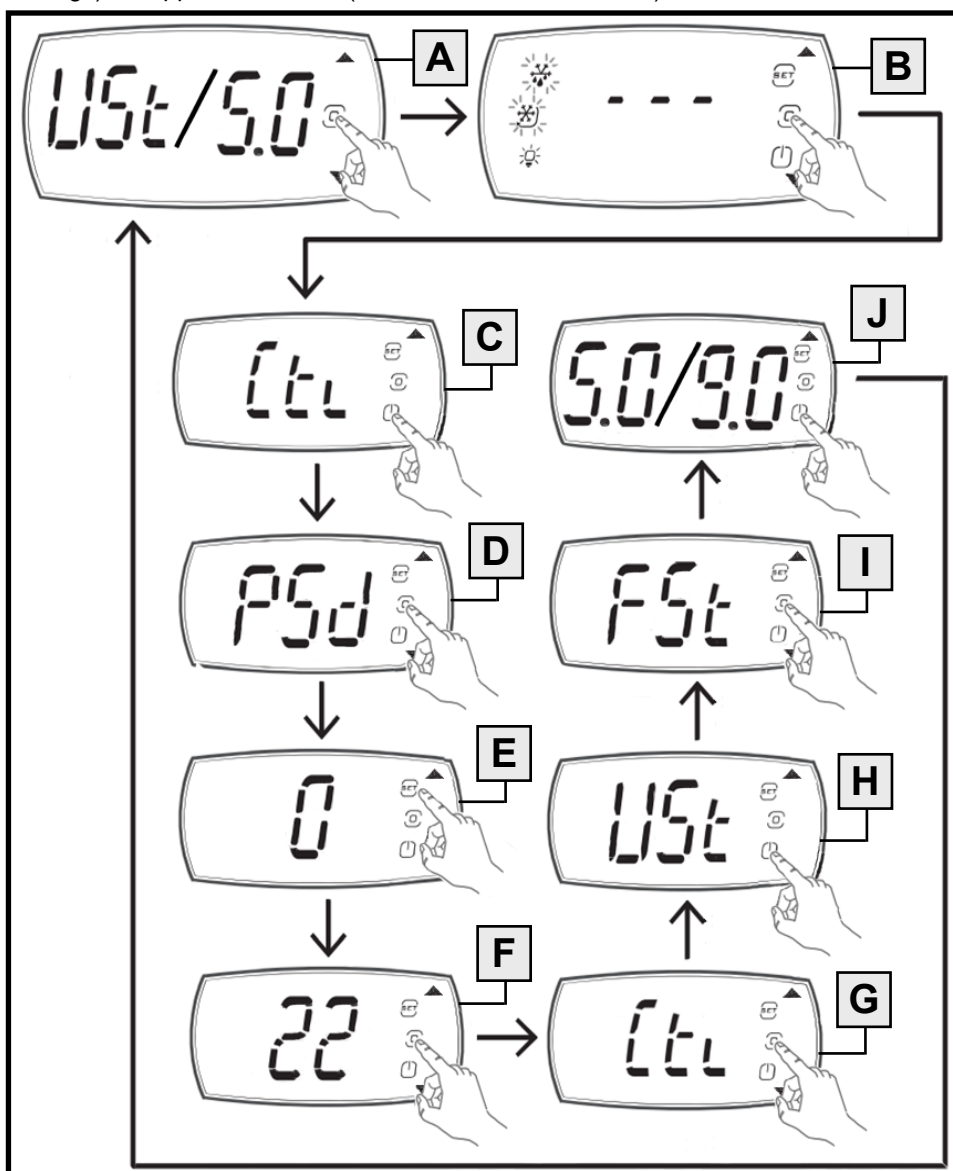
> Carel iJF Programmable Controller User Manual Continues on Next Page

9. Screen Navigation - Factory Settings

- The figures below show how to navigate between screens on the display to reset at FACTORY SETTINGS only.
- CAREL acronyms: "USt" = User Settings / "Ctl" = Control / "FSt" = Factory Settings / "ESC" = Escape / "dir" = Direct Functions / "PSd" = Password.
- The need to establish factory settings is seldom needed. If you must do so, it is suggested that you contact Structural Concepts technical support. HOWEVER, if you are not able to reach Structural Concepts, and must navigate the screen on your own, follow these steps.**

- Note:** These steps correspond with accompanying illustration.
- A. Default setting will alternately display USt (User Settings) and its temp. setting (1.0 to 10.0). **Note:** Illustration shows "USt/5" to convey that screen could be intermittently flashing "USt" and random number "5.0." To program to factory settings, press the Program icon once. The "---" will appear (see next step).
- B. Press Program icon again ("Ctl" appears; shown next step).
- C. "Ctl" (Control) now appears on the screen. Press On-Off/Down arrow icon again to get to "PSd" (password); shown in next illustration.
- D. Press Program icon again to enter password. It will default at "0" (as shown in next illustration).
- E. Press the Setpoint/Up icon until screen goes from displaying "0" to displaying "22" (as shown at next illustration).
- F. Press Program icon again. "Ctl" (control) will appear on screen.
- G. Press Program icon again. "USt" (User Settings) will appear on screen (as shown in next illustration).
- H. Press the On-Off/Down arrow icon once and "FSt" (Factory Settings) will appear (as shown in the next illustration).
- I. While "FSt" is on the screen, press the Program icon and its existing setting (from "1" to "10") will appear on the screen (as illustrated at next step).
- J. **Note:** At this point, both Setpoint/Up arrow icon AND the On-Off/Down arrow icon will be flashing. Press the Setpoint/Up arrow icon to raise the factory setting or press the On-Off/Down arrow icon to lower the setting (as you so desire).

- > After selecting your desired setting, press the Program icon. "FSt" will appear on the screen.
- > Press the On-Off/Down arrow icon. "ESC" (Escape) will appear on the screen.
- > Press the Program icon again and "Ctl" (Control) will appear on the screen.
- > Press the On/Off/Down arrow icon twice to reach "ESC" (escape).
- > After approx. 5 seconds, the flashing icons will stop and the new flashing "USt/8" (or whatever User Setting have been selected) will alternately appear on the screen (as illustrated in step "A" of these instructions).
- > User Settings have now been selected and locked.
- > End of Screen Navigation - Factory Settings instructions.





**Dixell® XM670K-XM679K
Platform**

Dixell® XM670K-XM679K Programmable Controllers For Refrigerated Cases

Dixell**Installing and operating instructions****EMERSON****CONTROLLERS FOR MULTIPLEXED CABINETS****XM670K - XM679K****- MANUAL FOR THE SW REL 3.4 -****1. GENERAL WARNING****1.1 PLEASE READ BEFORE USING THIS MANUAL**

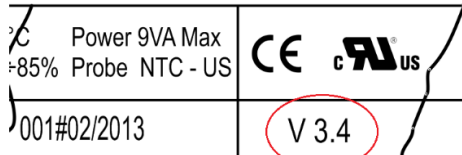
- This manual is part of the product and should be kept near the instrument for easy and quick reference.
- The instrument shall not be used for purposes different from those described hereunder. It cannot be used as a safety device.
- Check the application limits before proceeding.
- Dixell S.r.l. reserves the right to change the composition of its products, even without notice, ensuring the same and unchanged functionality.

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.r.l." (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. BEFORE PROCEEDING**2.1 CHECK THE SW REL. OF THE XM679K**

1. Look at the SW rel. of XM679K printed on the label of the controller.



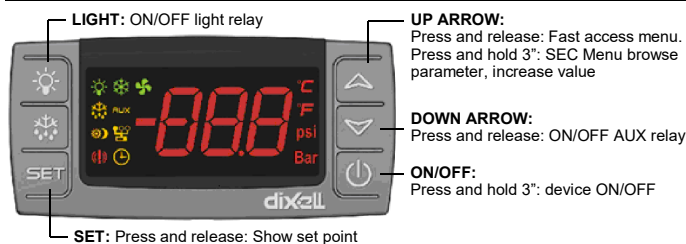
2. If the SW release is 3.4 proceed; otherwise, contact Dixell to secure correct manual.

3.0 GENERAL DESCRIPTION

The **XM670K/XM679K** are high level microprocessor-based controllers for multiplexed cabinets suitable for applications on medium or low temperature. It can be inserted in a LAN of up to 8 different sections which can operate (depending on the programming) as standalone controllers or following the commands coming from other sections.

The **XM670K/XM679K** have 6 relay outputs to control the solenoid valve, defrost (which can be either electrical or hot gas), evaporator fans, lights, an auxiliary output and an alarm output with one output to drive **pulsed electronic expansion valves (only XM679K)**. The devices are also provided with four probe inputs: 1) temperature control 2) control of defrost end temperature of evaporator 3) display 4) for application with virtual probe or for inlet/outlet air temperature measurement. Model **XM679K** is provided with two other probes to be used for superheat measurement and regulation. Finally, the **XM670K/XM679K** are equipped with three digital inputs (free contact) fully configurable by parameters.

Instruments are equipped with the HOTKEY connector that permits simple programming. Direct serial output **RS485 ModBUS-RTU** compatibility permits simple XWEB interfacing. **RTC** are available as options. The HOTKEY connector can be used to connect **X-REP** display (depending on the model).

3.01 KEYS & FUNCTIONS ON CONTROLLER FRONT PANEL**3.1 KEYS & FUNCTIONS ON CONTROLLER FRONT PANEL**

Key	Function
SET	Press to display the target setpoint, to select a parameter in programming mode, or to confirm an operation. Pressing this key for 3 seconds while the minimum or maximum temperature is displayed will erase the temperature currently displayed.
▲	Press this key to browse the parameter codes in programming mode or increases the displayed value. Pressing this key for 3 seconds will give you access to the Section menu.
▼	Press this key to access the fast access menu, browse the parameter codes in programming mode, decrease the displayed value, or activate or deactivate an auxiliary output.
❄	Starts a defrost when pressed for 3 seconds.
💡	Switches the room light ON and OFF.
⏻	Press for 3 seconds to switch the device ON and OFF.
°C	Measurement unit

Key	Function
°F	Measurement unit
BAR	Measurement unit
PSI	Measurement unit

Note: Units With These Temperature Controllers Have Been Hot-Keyed At Factory For General Operation.

Key Combinations	
▼ + ▲	Locks/Unlocks the keyboard
SET + ▼	Switches mode to programming mode
SET + ▲	Exits the programming mode

Dixell

Installing and operating instructions

EMERSON**3.2 USE OF LEDs**

Note: Units With These Temperature Controllers Have Been Hot-Keyed At Factory For General Operation.

LED	Mode	Function
	ON	Compressor and valve regulation enabled. To see the valve opening percentage, enter the fast access menu.
	Flashing	Anti-short cycle delay enabled
	ON	Defrost enabled
	Flashing	Drip time in progress
	ON	An alarm is occurring
	ON	Energy saving enabled
	ON	Fans enabled (fans are running)
	Flashing	Door opened or delay after defrost
AUX	ON	Auxiliary relay ON
°C/°F/Bar/PSI	ON	Measurement unit
	Flashing	Programming phase
	ON	The controller is working in ALL mode
	Flashing	The controller is working in remote virtual display mode
	Flashing	During the CLOCK modification (if clock is present)

3.3 HOW TO ENTER THE FAST ACCESS MENU

1. Press and release the UP button.
2. The First Label will be displayed. Press the UP or DOWN button to navigate the menu.

3.4 HOW TO SEE MAX AND MIN TEMPERATURE RECORDED

1. Press and release the UP button.
2. The First Label will be displayed. Press the UP or DOWN button to navigate the menu. Search the **L^ot** label and press SET to see minimum temperature; search the **H^ot** label and press SET to see maximum temperature.

3.5 HOW TO SEE AND MODIFY THE SETPOINT

1. Press the SET button for 3 seconds to show the setpoint value.
2. The measurement unit starts blinking.
3. To change the setpoint value, press the UP or DOWN button for 10 seconds.
4. To store the new setpoint value, press the SET key again or wait 10 seconds.

3.6 HOW TO START A MANUAL DEFROST

Press the **DEF** key for more than 3 seconds to start a manual defrost.

3.7 HOW TO ENTER THE PARAMETERS LIST PR1

To enter the parameter list in **Pr1** (user accessible parameters):

1. Enter the programming mode by pressing the SET and DOWN buttons for a few seconds (wait for the measurement unit to start blinking).
2. The controller will show the first parameter present in **Pr1**.

3.8 HOW TO ENTER THE PARAMETERS LIST PR2

To access the parameter list in **Pr2**:

1. Enter the **Pr1** level. Follow the steps in **Section 3.7., How to Enter the Parameters List PR1**.
2. Select **Pr2** parameter and press the SET key.
3. The **PAS** flashing message will display, followed shortly by "0 --" with a flashing zero.
4. Use the UP or DOWN button to input the security code in the flashing digit. Confirm the security code by pressing SET. The security code is **321**.
5. If the security code is correct, the access to **Pr2** is enabled by pressing SET on the last digit.

Another way to enter the programming mode is by pressing the SET and DOWN buttons for 30 seconds immediately after switching the controller ON.



NOTE: Each parameter in Pr2 can be removed or put into Pr1 (user level) by pressing SET + DOWN buttons. When a parameter is present in Pr1, the Alarm LED will be display.

Dixell**Installing and operating instructions****EMERSON****3.9 HOW TO ASSIGN A MODBUS ADDRESS**

1. To enter the programming mode, press and hold the SET and DOWN buttons together until the temperature measurements start blinking.
2. Scroll through the parameters using the UP or DOWN button until **Adr** is displayed.
3. Press and hold SET to select **Adr**.
4. Use the arrow keys to choose the address number of the device.
5. Press and hold SET again to select the desired number and save.
6. To exit, press the SET and UP arrow keys together.

3.10 HOW TO CHANGE THE PARAMETER VALUE

1. Enter the programming mode.
2. Select the required parameter using the UP or DOWN button.
3. Press the SET key to display the parameter value (measurement unit starts blinking).
4. Use the UP or DOWN button to change the value.
5. Press SET to store the new value and move to the next parameter.
6. To exit, press SET + UP keys or wait 15 seconds without pressing a key.

3.11 ON/OFF FUNCTION

By pressing the ON/OFF key, the controller shows OFF. During the OFF status, all the relays are switched OFF and the regulations are stopped; if a monitoring system is connected, it does not record the controller data and alarms.



NOTE: During the OFF status, the Light and AUX buttons are active.

4. FAST ACCESS MENU

Note: Units With These Temperature Controllers Have Been Hot-Keyed At Factory For General Operation.

FAST ACCESS MENU

HM	Fast Access Menu to Clock Settings	(If present)
An	Fast Access to Analog Output Reading	(If present)
SH	Superheat	Shows the actual superheat value (Only XM679)
oPP	Valve opening percentage	Shows the actual opening percentage of the valve (Only XM679)
dP1	Probe 1 value displaying	Shows the temperature measured by probe 1
dP2	Probe 2 value displaying	Shows the temperature measured by probe 2
dP3	Probe 3 value displaying	Shows the temperature measured by probe 3
dP4	Probe 4 value displaying	Shows the temperature measured by probe 4
dP5	Probe 5 value displaying	Shows the temperature measured by probe 5
dP6	Probe 6 value displaying	Shows the temperature measured by probe 6
dPP	Pressure probe value	Shows the value of pressure measured by pressure transducer (Only XM679)
rPP	Remote pressure probe value	Shows the value of pressure received by remote pressure probe connected to other XM600 device (Only XM679)
L°t	Minimum measured temperature	Shows the minimum temperature read by the regulation probe
H°t	Maximum measured temperature	Shows the maximum temperature read by the regulation probe
dPr	Virtual regulation probe value	Shows the value measured by the virtual regulation probe
dPd	Virtual defrost probe value	Shows the value measured by the virtual defrost probe
dPF	Virtual fans probe value	Shows the value measured by virtual fan probe
rSE	Real setpoint	Shows the setpoint used during the energy saving cycle or during the continuous cycle

Dixell

Installing and operating instructions

EMERSON**5.0 SECTIONS MENU**

This menu allows the user to access to a particular feature of the XM series related to the LAN (Local Area Network) of controllers. Depending on the programming of this menu, a single keyboard can control either the module of the local section of the LAN or ALL. The possibilities are: LOC: the keyboard controls and display the value, the status, and the alarms of the local section of the LAN; and ALL: the command given by the keyboard are effective on all the sections of the LAN.

1. Press the UP key for more than 3 seconds.
2. The label corresponding to the section controlled by the keyboard will be displayed.
3. Using the UP or DOWN key, select the section you want to control.
4. Press the SET key to confirm and exit.

5.1 TO SET ENERGY SAVING TIMES

ILE	Energy Saving cycle start during workdays	(0 to 23 h 50 min) During the Energy Saving cycle, the setpoint is increased by the value in HES so that the operation setpoint is SET + HES.
dLE	Energy Saving cycle length during workdays	(0 to 24 h 00 min) Sets the duration of the Energy Saving cycle on workdays.
ISE	Energy Saving cycle start on holidays	(0 to 23h 50 min)
dSE	Energy Saving cycle length on holidays	(0 o 24h 00 min)
HES	Temperature increase during the Energy Saving cycle	(-30 to 30°C/ -54 to 54°F) Sets the increasing value of the setpoint during the Energy Saving cycle.

5.2 TO SET TIMED DEFROST PARAMETERS

Ld1 to Ld6	Workday defrost start	(0 to 23h 50 min) These parameters set the beginning of the eight programmable defrost cycles during workdays. For example, when Ld2=12.4, the second defrost starts at 12.40 during workdays.
Sd1 to Sd6	Holiday defrost start	(0 to 23h 50 min) These parameters set the beginning of the eight programmable defrost cycles during holidays. For example, when Sd2=3.4, the second defrost starts at 3.40 on holidays.



NOTE: To disable a defrost cycle, set it to nu (not used). For example, if Ld6=nu, the sixth defrost cycle is disabled.

6.0 ELECTRONIC EXPANSION VALVE MENU (MODEL XM679 ONLY)

1. Enter the programming mode by pressing the SET and DOWN buttons for a few seconds (measurement unit starts blinking).
2. Press the UP or DOWN key until the controller displays the EEV label.
3. Press SET. You are now in EEV function menu.

7.0 CONTROLLING LOADS / 7.1 SOLENOID VALVE

The regulation is performed based on the temperature measured by the thermostat probe (either physical or virtual) obtained by a weighted average between the two probes with a positive differential from the setpoint. If the temperature increases and reaches setpoint plus the differential, the solenoid valve is opened and then it is closed when the temperature reaches the setpoint value again.

Note: Units With These Temperature Controllers Have Been Hot-Keyed At Factory For General Operation.

In case of fault in the thermostat probe, the opening and closing time of the solenoid valve is configured by **Con** and **CoF** parameters.

19. USE OF THE PROGRAMMING "HOT KEY"

The XM units can UPLOAD or DOWNLOAD the parameter list from its own E2 internal memory to the "Hot Key" and vice-versa through a TTL connector.

19.1 DOWNLOAD (FROM THE "HOT KEY" TO THE INSTRUMENT)

1. Turn OFF the instrument by means of the ON/OFF key, insert the "Hot Key" and then turn the unit ON.
2. Automatically the parameter list of the "Hot Key" is downloaded into the controller memory, the "doL" message is blinking. After 10 seconds the instrument will restart working with the new parameters. At the end of the data transfer phase the instrument displays the following messages: "end" for right programming. The instrument starts regularly with the new programming. "err" 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.

19.2 UPLOAD (FROM THE INSTRUMENT TO THE "HOT KEY")

1. When the XM unit is ON, insert the "Hot key" and push $\leftarrow$ key; the "uPL" message appears.
 2. The UPLOAD begins; the "uPL" message is blinking.
 3. Remove the "Hot Key".
- At the end of the data transfer phase the instrument displays the following messages:
- "end" for right programming.
 - "err" for failed programming. In this case push "SET" key if you want to restart the programming again or remove the not programmed "Hot key".

STRUCTURAL CONCEPTS TECHNICAL SERVICE CONTACT INFORMATION & LIMITED WARRANTY

TECH SERVICE/WARRANTY CONTACT INFO:

1 (800) 433-9490 / EXTENSION 1

DAYS/HOURS AVAILABLE:

MONDAY - FRIDAY (CLOSED HOLIDAYS)
8:00 AM to 8:00 PM EST

YOU MUST HAVE THE FOLLOWING INFO AVAILABLE BEFORE CONTACTING STRUCTURAL CONCEPTS:

SERIAL NO. / MODEL NO. / STORE NO. / STORE
ADDRESS / DETAILS (PHOTOS, LEAK LOCATIONS,
DAMAGE, STORE'S AMBIENT CONDITIONS, ETC.)

To Access The Limited Warranty To Your Case, Follow These Instructions:

- > If Viewing This Document on Smart Phone, Tablet or Computer, Select/Click On The QR Code at Right.
- > If Viewing This Document In Print (Hard Copy), Scan The QR Code at Right With Your Smart Phone or Tablet.

