K2 SCIENTIFIC

Evco Controller Operating Manual

Thank you for your purchase.
This manual contains: set-up instructions, unit specs, safety information, controller operation, and maintenance steps.

K212, K225, K249, K272

IMPORTANT:

Your unit is preprogrammed

Place your unit in the desired location. Plug the unit in and allow it to cool and become stable for a minimum of 24 hours before logging temperature or stocking products.

Be careful when setting or changing temperatures

WARNING: Changing some controller parameters can damage your unit and/or result in a loss of product. K2 will not be held responsible for losses due to unauthorized parameter changes.

Changing advanced parameters may damage the unit or void your warranty. Please contact K2 before attempting to change advanced parameters.

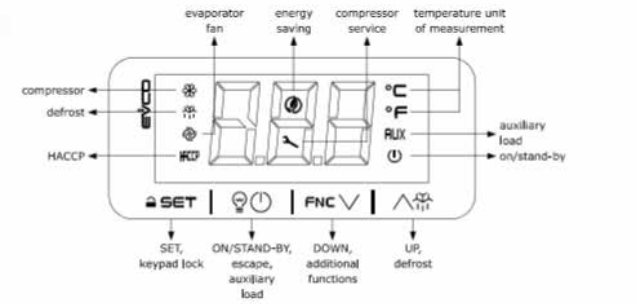
Unfamiliar with the operation of a K2 controller?

Use the video tutorials on our website resources page or call us for assistance with special parameters.

04.15.2021

CONTENTS

1 Front Panel Commands



LED	MODE	MEANING
❄	-ON -OFF -Blinking	-Compressor ON -Compressor OFF -Compressor protection activated/set point temperature menu
❄	-ON -OFF -Blinking	- Active Defrost/ pre-dripping cycle -No action. -Defrost delay time/active dripping cycle
◎	-ON -OFF -Blinking	-Evaporator fan ON -Evaporator fan OFF -Evaporator fan stop
HACCP	-ON -OFF -Blinking	-HACCP alarm recorded in EVlink module -no action -no action
◔	-ON -OFF -Blinking	-Active Energy saving mode -no action -no action
🔧	-ON -OFF -Blinking	-request of compressor's servicing -no action -active settings mode/ active access to additional functions/ active connection with EVlink module
°C/°F	-ON -OFF -Blinking	-Normal temperature view -no action -Active overheating/overcooling cycle
AUX	-ON -OFF -Blinking	-Auxiliary load ON -Auxiliary load OFF -Auxiliary Load activated by digital input / Auxiliary Load activation delay
⏻	-ON -OFF -Blinking	-Device OFF -Device ON -Device ON/OFF mode

2 General Operations

Keypad Unlocking

- The keypad will lock automatically after 30 seconds if the default parameter Loc=1 is set.
- To unlock the keypad, touch the SET key for 1 second. Then the display will show the label "**UnL**".

Temperature Settings

- If the keypad is locked, first unlock it.
- Touch the SET key then set the desired temperature by pressing the UP or DOWN keys within 15 seconds.
- Your set temperatures must be within temperature range high and low limits. The limits range of the set point (parameters **r1** and **r2**)
- Press SET to confirm.

Cabinet Light

- If the parameter is u1=0
- Touch the ON/STAND-BY key.

Buzzer

- If the parameters u1=3 and u4=1 touch any key to shut down the buzzer alarm.

Manual Defrost

- Unlock the keypad
- Press the UP key, holding it for 2 seconds.
- If the parameter **P3=1** and the evaporator temperature value is lower than the parameter **d2**, defrost cycle will start.

Compressor Opperational Time

- Make sure the keypad is unlocked and press the DOWN key for 4 seconds.
- Scroll through the menu labels with the UP and DOWN keys.
  - **CH** label: displaying compressor operating hours.
  - **rCH** label: compressor operating hours reset.
  - **nS1** label: compressor star-up time.
- To access the label press SET.
- In order to reset the compressor operating hours once selected the **rCH** label, insert the password "**149**" using the UP and DOWN keys then confirm touching the SET key.
- Touch the ON/STANDBY key to exit the procedure.

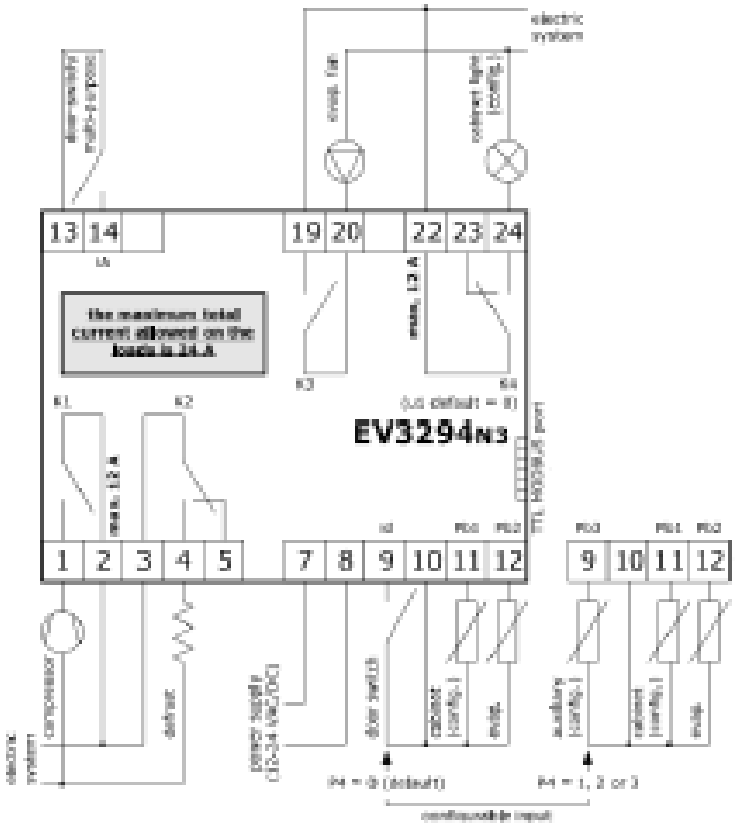
Displaying Temperature Probes

- Ensure the keypad is unlocked then press the DOWN key for 4 seconds.
- Scroll through the menu's labels by the UP or DOWN key.
  - **Pb1:** cabinet temperature probe (if parameter **P4=0,1** or **2**); inlet air temperature probe (if parameter **P4=3**).
  - **Pb2:** Evaporator temperature probe (if parameter **P3=1** or **2**)
  - **Pb3:** Auxiliary temperature probe (If **P4=1, 2** or **3**).
- To access the label press SET.
- Touch the ON/STANDBY key to exit the procedure.

4 Alarms

Alarm code	Code description	Solution
Pr1	Cabinet probe alarm	-Check the parameter P0. -Check the status of the probe. -Check the electrical connection. -Replace the probe.
Pr2	Evaporator probe alarm	
Pr3	Auxiliary probe alarm	
rtc	Date and time alarm	Set date, time and day of the week.
AL	Low Temperature Alarm	Check the parameters **AA**, **A1** and **A2**
AH	High Temperature Alarm	Check the parameter **AA**, **A4** and **A5**
id	Door open alarm	Check the parameter **i0 and i1**
PF	Power failure alarm	-Check electrical connection **-**Touch any key to shut the buzzer off
COH	High condenser warning	-Check if the condenser probe is installed. -Check the parameter **C6** -Check the condenser coil is clean.
CSd	High condensation alarm	Check if the condenser probe is installed. -Check the parameter **C7.** -Check the condenser coil is clean. -Reboot the device.
iA	Multi-function input alarm	-Check the parameters **i5** and **i6**
Cth	Compressor thermal switch alarm	-Check the parameters **i5** and **i6**
th	Global thermal switch alarm	-Check the parameters **i5** and **i6** -Reboot the device
dFd	Defrost time out alarm	-Check the parameters **d2, d3** and **d11**

5 Electrical Connection



3 Parameters

WARNING: Do not modify parameters in this unit without fully understanding their function. Changing advanced parameters may damage the unit and void your warranty. Please contact K2 before attempting to change advanced parameters.

Accessing Operational Parameters

- Touch the SET key for 4 seconds, the monitor will display the label "**PA**"
- Press the SET key and insert the password "**-19**"
- Press SET key to confirm
- Scroll through the parameters list using the UP or DOWN key
- For modifying a parameter value, press SET key at the parameter label then adjust the value by the UP or DOWN key
- Press SET key to confirm the change
- Press SET key for 4 seconds or do not operate for 60 sec to exit the procedure.

Basic parameters

N	Parameter	Default	Setpoint
1	SP	**0.0**	setpoint
8	P3	**1**	evaporator probe function
13	r0	**2.0**	setpoint differential
14	r1	**-50**	minimum setpoint
15	r2	**50.0**	maximum setpoint
33	d0	**8**	automatic defrost interval
34	d1	**0**	defrost type
35	d2	**8.0**	threshold for defrost end
36	d3	**30**	defrost duration
51	AA	**0**	select value for high/low temperature alarms
52	A1	**-10.0**	threshold for low temperature alarm
53	A2	**2**	low temperature alarm type
54	A4	**10.0**	threshold for high temperature alarm
55	A5	**2**	high temperature alarm type
74	i0	**5**	door switch input section
75	i1	**0**	door switch input activation
76	i2	**30**	open door alarm delay

Full list of parameters

N.	PAR.	DEF.	SETPOINT	MIN... MAX.
1	SP	**-20**	setpoint	r1... r2
N.	**PAR.**	**DEF.**	**ANALOGUE INPUTS**	**MIN... MAX.**
2	CA1	**0.0**	cabinet probe offset	-25... 25 °C
3	CA2	**0.0**	evaporator probe offset	-25... 25 °C
4	CA3	**0.0**	condenser probe offset	-25... 25 °C
5	P0	**1**	probe type	0 = PTC 1 = NTC
6	P1	**0**	enable °C decimal point	0 = no 1 = yes
8	P3	**1**	evaporator probe function	0 = disabled 1 = defrost + fan 2 = fan
9	P4	**2**	configurable input function	0 = door switch input 1 = condenser probe 2 = condenser probe + door switch input
10	P5	**0**	value displayed	0 = cabinet temperature 1 = setpoint 2 = evaporator temperature 3 = condenser temperature
11	P8	**0**	display refresh time	0... 250 s : 10
N.	**PAR.**	**DEF.**	**REGULATION**	**MIN... MAX.**
12	r0	**3.0**	setpoint differential	1... 15 °C
13	r1	**-30**	minimum setpoint	-99 °C ... r2
14	r2	**-10**	maximum setpoint	r1... 199 °C
15	r4	**0.0**	setpoint offset in energy saving	0... 99 °C
16	r5	**0**	cooling or heating operation	0 = cooling 1 = heating
17	r6	**0.0**	setpoint offset in overcooling/overheating	0... 99 °C
18	r7	**0**	overcooling/overheating duration	0... 240 min
19	r8	**0**	DOWN key additional function	0 = disabled 1 = overcooling/overheating 2 = energy saving
20	r13	**25.0**	proportional band (relative to setpoint)	0... 99 °C setpoint + r13
21	r14	**10**	integral action time	0... 99 min

N.	PAR.	DEF.	COMPRESSOR	MIN... MAX.
23	CP0	**0**	time compressor at 85 Hz after power-on	0... 100 s x 10
24	C0	**1**	compressor on delay after power-on	0... 240 min
25	C2	**3**	compressor off minimum time	0... 240 min
26	C3	**0**	compressor on minimum time (minimum speed)	0... 240 s
27	C4	**5**	compressor off time during cabinet probe alarm	0... 240 min
28	C5	**10**	compressor on time (maximum speed) during cabinet probe alarm	0... 240 min
29	C6	**55.0**	threshold for high condensation warning	0... 199 °C differential = 2 °C/4
30	C7	**60.0**	threshold for high condensation alarm	0... 199 °C
31	C8	**1**	high condensation alarm delay	0... 15 min
32	C9	**5**	consecutive time cabinet temperature in proportional band for compressor at maximum speed	0... 99 h 0 = disabled until cabinet temperature < setpoint
33	C10	**0**	compressor hours for service	0... 999 h x 10 0 = disabled

N.	PAR.	DEF.	DEFROST (if r5 = 0)	MIN... MAX.
34	d0	**12**	automatic defrost interval	0... 99 h 0 = only manual if d8 = 3, maximum interval
35	d1	**1**	defrost type	0 = electric 1 = hot gas 2 = compressor stopped
36	d2	**6.0**	threshold for defrost end	-99... 99 °C
37	d3	**30**	defrost duration	0... 99 min se P3 = 1, maximum duration
38	d4	**0**	enable defrost at power-on	0 = no 1 = yes
39	d5	**0**	defrost dealy after power-on	0... 99 min
40	d6	**1**	value displayed during defrost	0 = cabinet temperature 1 = display locked 2 = dEF label
41	d7	**3**	dripping time	0... 15 min
42	d8	**0**	defrost interval counting mode	0 = device on hours 1 = compressor on hours 2 = hours evaporator temperature < d9 3 = adaptive
43	d9	**0.0**	evaporation threshold for automatic defrost interval counting	-99... 99 °C
44	d11	**1**	enable defrost timeout alarm	0 = no 1 = yes
45	d15	**0**	compressor on consecutive time for hot gas defrost	-20... 99 min if negative values, dripping heaters on duration
46	d16	**0**	pre-dripping time for hot gas defrost	0... 99 min

46	d16	**0**	pre-dripping time for hot gas defrost	0... 99 min
47	d18	**0**	adaptive defrost interval	0... 999 min if compressor on + evaporator temperature < d22 0 = only manual
48	d19	**0.0**	threshold for adaptive defrost (relative to optimal evaporation temperature)	0... 40 °C optimal evaporation temperature - d19
49	d20	**0**	compressor on consecutive time for defrost	0... 999 min 0 = disabled
50	d21	**0**	compressor on consecutive time for defrost after power-on and overcooling	0... 500 min if (regulation temperature - setpoint) > 10°C/20 0 = disabled
51	d22	**0.0**	evaporation threshold for adaptive defrost interval counting (relative to optimal evaporation temperature)	-10... 10 °C/°F optimal evaporation temperature + d22
N.	PAR.	DEF.	ALARMS	MIN... MAX.
52	A1	**0.0**	threshold for low temperature alarm (relative to setpoint)	0... 99 °C 0 = disabled cabinet temperature - A1
53	A4	**50.0**	threshold for high temperature alarm (relative to setpoint)	0... 99 °C 0 = disabled cabinet temperature + A4
54	A6	**12**	high temperature alarm delay after power-on	0... 99 min x 10
55	A7	**15**	high/low temperature alarms delay	0... 240 min
56	A8	**15**	high temperature alarm delay after defrost	0... 240 min
57	A9	**15**	high temperature alarm delay after door closing	0... 240 min
58	A11	**2.0**	high/low temperature alarms reset differential	1... 15 °C
N.	PAR.	DEF.	FANS	MIN... MAX.
59	F0	**1**	evaporator fan mode during normal operation	0 = off 1 = on 2 = according to F15 and F16 if compressor off, on if compressor on 3 = thermoregulated (with F1) 4 = thermoregulated (with F1) if compressor on

60	F1	**0.1**	threshold for evaporator fan operation	1... 15 °C
61	F2	**0**	evaporator fan mode during defrost and dripping	0 = off 1 = on 2 = according to F0
62	F3	**2**	evaporator fan stop maximum duration	0... 15 min
63	F4	**30**	evaporator fan off time during energy saving	0... 240 s x 10
64	F5	**30**	evaporator fan on time during energy saving	0... 240 s x 10
65	F6	**30**	evaporator fan on time after compressor on	0... 240 s x 10 if F0 = 3 or 4
66	F7	**20.0**	threshold for evaporator fan on after dripping (relative to setpoint)	-99... 99 °C setpoint + F7
67	F8	**2.0**	threshold for evaporator fan operation differential	1... 15 °C
68	F9	**10**	evaporator fan off delay after compressor off	0... 240 s if F0 = 2
69	F10	**0**	evaporator fan and condenser fan off minimum time	0... 240 s
70	F11	**10.0**	threshold for condenser fan on	0... 99 °C
71	F12	**0**	condenser fan off delay after compressor off	0... 240 s if P4 = 0
72	F13	**2.0**	threshold for condenser fan on differential	1... 15 °C
73	F14	**0**	condenser fan mode	0 = thermoregulated (with F11) 1 = thermoregulated (with F11) if compressor on
74	F15	**60**	evaporator fan off time with compressor off	0... 240 s if F0 = 2
75	F16	**10**	evaporator fan on time with compressor off	0... 240 s if F0 = 2
N.	PAR.	DEF.	DIGITAL INPUTS	MIN... MAX.
76	i0	**2**	door switch input function	0 = disabled 1 = compressor + evaporator fan off 2 = evaporator fan off 3 = cabinet light on 4 = compressor + evaporator fan off, cabinet light on 5 = evaporator fan off + cabinet light on
77	i1	**1**	door switch input activation	0 = with contact closed 1 = with contact open
78	i2	**0**	open door alarm delay	-1... 120 min -1 = disabled
79	i3	**-1**	regulation inhibition maximum time with door open	-1... 120 min -1 = until the closing
80	i10	**0**	door closed consecutive time for energy saving	0... 999 min after regulation temperature < SP 0 = disabled

	81	i13	**0**	number of door openings for defrost	0... 240 0 = disabled
	82	i14	**0**	door open consecutive time for defrost	0... 240 min 0 = disabled
	N.	PAR.	DEF.	DIGITAL OUTPUTS	MIN... MAX.
	83	uc	**1**	enable relay K1 and relay K4 inversion	0 = no 1 = yes
	84	uc2	**0**	relay K2 configuration	0 = evaporator fan 1 = dripping heaters
	85	uc3	**1**	relay K3 configuration	0 = condenser fan 1 = cabinet light 2 = demisting 3 = on/stand-by 4 = compressor
	86	u1	**6**	relay K4 configuration	0 = cabinet light 1 = demisting 2 = button-operated load 3 = alarm 4 = door heaters 5 = heater for neutral zone 6 = condenser fan 7 = on/stand-by
	87	u2	**1**	enable cabinet light and button-operated load in stand-by	0 = no 1 = yes manual
	88	u4	**0**	enable alarm output off silencing the buzzer	0 = no 1 = yes
	89	u5	**-1.0**	threshold for door heaters on	-99... 99 °C differential = 2 °C/4
	90	u6	**5**	demisting on duration	1... 100 min x 10
	91	u7	**-5.0**	neutral zone threshold for heating (relative to setpoint)	-99... 99 °C/°F differential = 2 °C/4 setpoint + u7
	N.	PAR.	DEF.	ENERGY SAVING (if r5 = 0)	MIN... MAX.
	92	HE2	**0**	energy saving maximum duration	0... 999 min -1 = until the door opening
	93	HE3	**0**	consecutive time without operating on keys for low consumption	0... 240 min
	N.	PAR.	DEF.	SAFETIES	MIN... MAX.
	94	POF	**1**	enable ON/STAND-BY key	0 = no 1 = yes
	95	PAS	**22**	password	-99... 999

6 Temperature Logging

When storing vaccines you may be required to preform a field validation test. A NIST callibrated external data logger can be used for this purpose. A data logger with text, email or online access is an added layer of protection for your product load in the event of a temperature excursion. K2 offers NIST calibrated data loggers to match your unit.

Service

K2 Scientific want to make sure you are happy with your purchase. There are several ways for you to contact us with questions or service needs. Be sure to include your four digit order number or at least your model number handy to speed up the process.

1; Contact us via our chat feature at www.k2sci.com

2: Email support@k2sci.com

3: Call 800-218-7613