EV3 Basic Split

Split-version controllers for refrigerated units

I ENGLISH

- controllers for normal and low temperature units
- power supply 115... 230 VAC or 230 VAC (according to the model)
- cabinet probe and evaporator probe (PTC/NTC)
- door switch and multi-purpose input (according to the model)
- compressor relay 16 A res. @ 250 VAC
- sealed relays compliant with the standard EN 60079-15
- management of Embraco and Secop variable capacity compressors (according to the model)
- management of 0-10 V compressor and fans (according to the model)
- output 12 VDC max. 30 mA (according to the model)
- alarm buzzer
- TTL MODBUS slave port for EVJKEY programming key, EVconnect app, EPoCA remote monitoring system or for BMS
- hot or cold mode regulation.

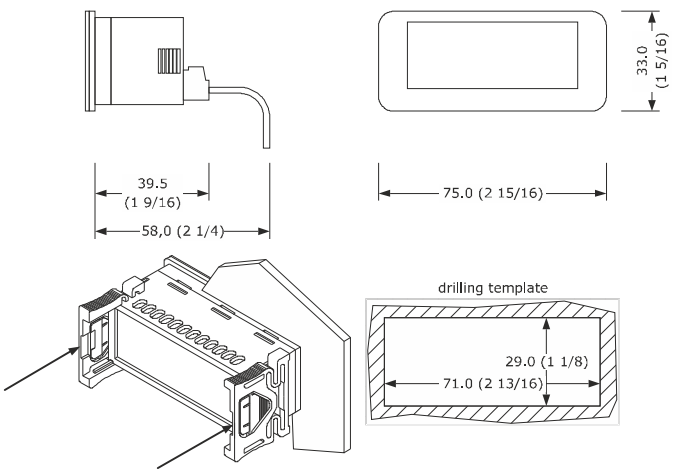
Purchasing code	Number of relays	Power supply	Management of variable capacity compressors	Output 12 VDC max. 30 mA
EV3SB22N7	2	230 VAC	no	no
EV3SB24N7	4	230 VAC	no	no
EV3SB54N9	4	115... 230 VAC	yes	yes

1 MEASUREMENTS AND INSTALLATION | Measurements in mm (inches)

1.1 User interface

To be fitted to a panel, snap-in brackets provided.

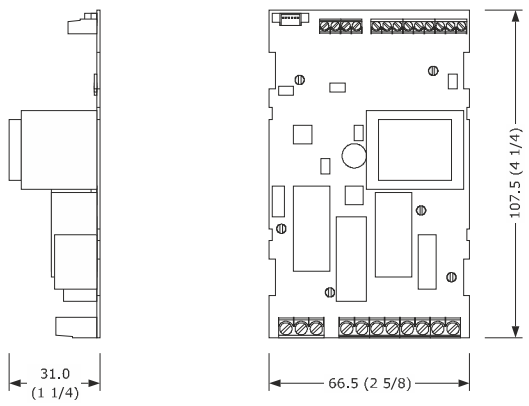
N.B.
The thickness of the panel must be between 0.8 and 2.0 mm (1/32 and 1/16 in).



1.2 Control module

To be installed on an electrical panel, on plastic spacers (not provided).

N.B.
Any metal parts must be far enough away so as not to compromise safety distances.

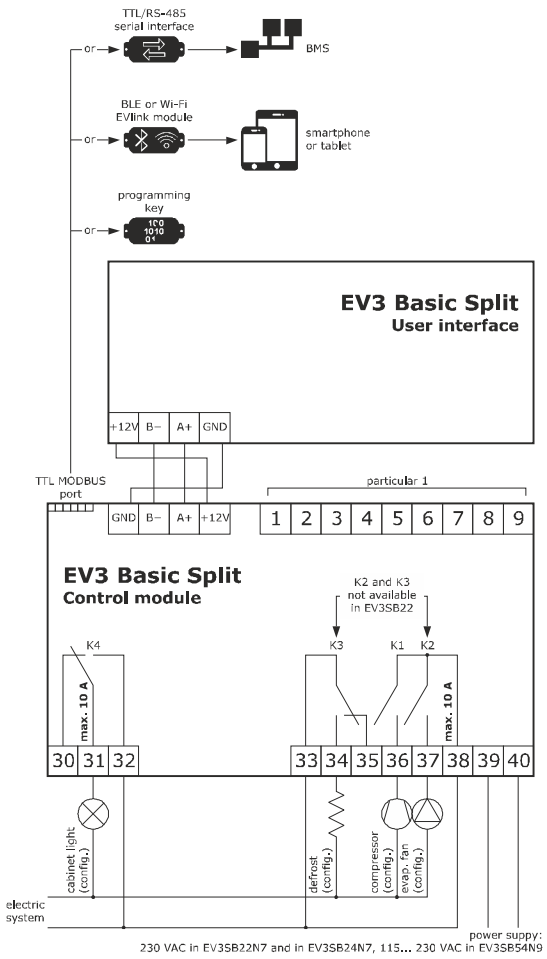


INSTALLATION PRECAUTIONS

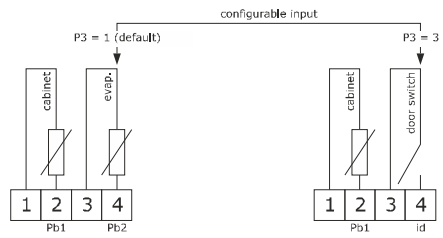
- ensure that the working conditions are within the limits stated in the *TECHNICAL SPECIFICATIONS* section
- do not install the device close to heat sources, equipment with a strong magnetic field, in places subject to direct sunlight, rain, damp, excessive dust, mechanical vibrations or shocks
- in compliance with safety regulations, the device must be installed properly to ensure adequate protection from contact with electrical parts. All protective parts must be fixed in such a way as to need the aid of a tool to remove them.

2 ELECTRICAL CONNECTION

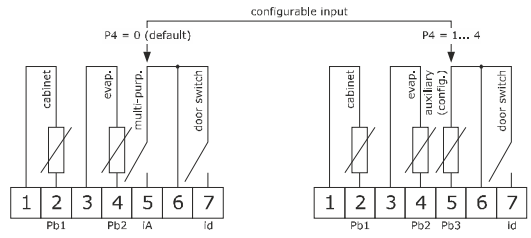
N.B.
- use cables of an adequate section for the current running through them
- to reduce any electromagnetic interference, locate the power cables as far away as possible from the signal cables.



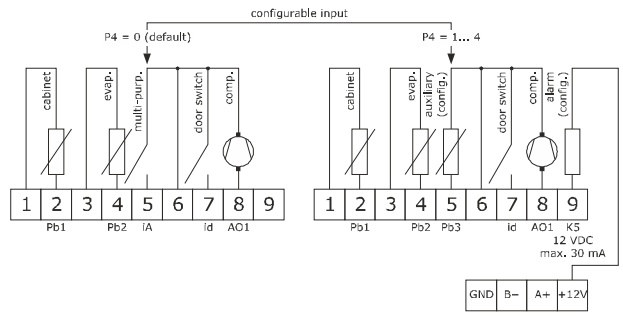
Particular 1 for EV3SB22



Particular 1 for EV3SB24



Particular 1 for EV3SB54



PRECAUTIONS FOR ELECTRICAL CONNECTION

- if using an electrical or pneumatic screwdriver, adjust the tightening torque
- if the device is moved from a cold to a warm place, humidity may cause condensation to form inside. Wait for about an hour before switching on the power
- make sure that the supply voltage, electrical frequency and power are within the set limits. See the section *TECHNICAL SPECIFICATIONS*
- disconnect the power supply before carrying out any type of maintenance
- do not use the device as a safety device
- for repairs and for further information, contact the EVCO sales network.

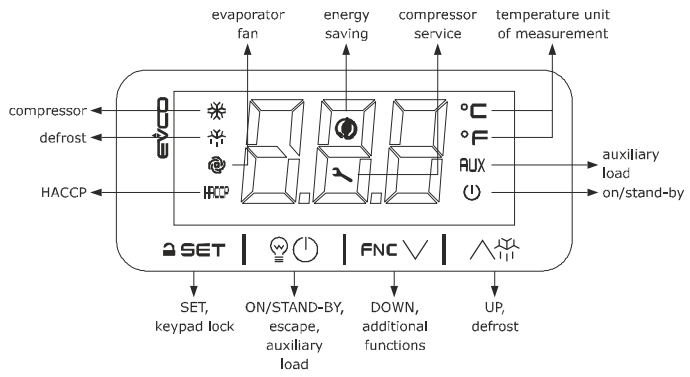
3 FIRST-TIME USE

1. Carry out the installation following the instructions given in the section *MEASUREMENTS AND INSTALLATION*.
2. Power up the device as set out in the section *ELECTRICAL CONNECTION*: an internal test will start up.
   The test normally takes a few seconds; when it is finished the display will switch off.
3. Configure the device as shown in the section *Setting configuration parameters*.
   Recommended configuration parameters for first-time use:

PAR.	DEF.	PARAMETER	MIN... MAX.
SP	**0.0**	setpoint	r1... r2
P0	**1**	type of probe	0 = PTC 1 = NTC
P2	**0**	temperature measurement unit	0 = °C 1 = °F
d1	**0**	type of defrost	0 = electric 1 = hot gas 2 = compressor stopped

   Then check that the remaining settings are appropriate; see the section *CONFIGURATION PARAMETERS*.
4. Disconnect the device from the mains.
5. Make the electrical connection as shown in the section *ELECTRICAL CONNECTION*, without powering up the device.
6. To use the device with the Evconnect app, connect the EVIF25TBX module. To use the device with the EPoCA remote monitoring system, connect the EVIF25TWX module. When connecting to an RS-485 network, connect the EVIF22TSX interface. To activate real-time functions, connect the EVIF23TSX module.
   If using EVIF22TSX or EVIF23TSX, set the bLE parameter to 0.
7. Power up the device.

4 USER INTERFACE AND MAIN FUNCTIONS



4.1 Switching the device on/off

1. | ON/STAND-BY | If POF = 1 (default), touch the ON/STAND-BY key for 4 s.

If the device is switched on, the display will show the P5 value ("regulation temperature" default); if the display shows an alarm code, see the section ALARMS.

LED	ON	OFF	FLASHING
	compressor switched on	compressor switched off	- compressor protection in progress - setpoint being set
	defrost or pre-drip active	-	- defrosting delay in progress - dripping active
	evaporator fans on	evaporator fans off	evaporator fan stop in progress
HACCP	HACCP alarm saved in EVlink	-	-
	energy saving active	-	-
	compressor maintenance request	-	- settings in progress - access to additional functions in progress
°C/°F	temperature display	-	overcooling or overheating active
AUX	auxiliary load on	auxiliary load off	- auxiliary load on from digital input - auxiliary load delay in progress
	device switched off	device switched on	device being switched on/off

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

4.2 Unlocking the keypad

Touch a key for 1 s: the display will show the label "**UnL**".

4.3 Setting the setpoint

Check that the keypad is not locked.

1. | SET | Touch the SET key.
2. | UP or DOWN | Touch the UP or DOWN keys within 15 s to set the value within the limits r1 and r2 (default "-40... 50").
3. | SET | Touch the SET key (or take no action for 15 s).

4.4 Setting the evaporator fan speed (percentage of the maximum capacity; only available for EV3SB54, if Ao1 = 3 and F30 = 0)

Check that the keypad is not locked.

1. | SET | Touch the SET key twice.
2. | UP or DOWN | Touch the UP or DOWN keys within 15 s to set the value within the limits F31 and F32 (default "50... 100").
3. | SET | Touch the SET key (or take no action for 15 s).

4.5 Activating manual defrost (if r5 = 0, default)

Check that the keypad is not locked and that overcooling is not active.

1. | UP | Touch the UP key for 4 s.

If P3 = 1 (default), defrost is activated provided that the evaporator temperature is lower than the d2 threshold.

4.6 Switching the cabinet light on/off (if u1c... u5c = 5)

1. | ON/STAND-BY | Touch the ON/STAND-BY key.

4.7 Switching the button operated load on/off (if u1c... u5c = 10 or 11)

1. | ON/STAND-BY | Touch the ON/STAND-BY key (for 2 s if u1c... u5c = 5).

If u1c... u5c = 6, the **demisting heaters** switch on for the u6 time.

4.8 Silencing the buzzer (if u9 = 1, default)

Touch a key.
If u1c... u5c = 11 and u4 = 1, the alarm output is deactivated.

5 ADDITIONAL FUNCTIONS

5.1 Activating/deactivating the overcooling, overheating and energy saving functions in manual mode

Check that the keypad is not locked.

1. | DOWN | Touch the DOWN key.

FUNCTION	CONDITION	CONSEQUENCE
overcooling	r5 = 0, r8 = 1 and defrosting not activated	the setpoint becomes "setpoint - r6", for the r7 time
overheating	r5 and r8 = 1	the setpoint becomes "setpoint + r6", for the r7 time
energy saving	r5 = 0 and r8 = 2	the setpoint becomes "setpoint + r4", at maximum for the HE2 time

5.2 Activating the high or low humidity function (if F0 = 5)

Check that the keypad is not locked.

1. | DOWN | Touch the DOWN key for 1 s.
2. | UP or DOWN | Touch the UP or DOWN key within 15 s to select the label "**rH**".
3. | SET | Touch the SET key for 2 s until the display shows the right label for the function (only touch the key to see the function activated).

LAB.	DESCRIPTION
rhL	low humidity function (evaporator fan with F17 and F18 if the compressor is off, on if the compressor is on)
rhH	high humidity function (evaporator fan on)

4. | ON/STAND-BY | Touch the ON/STAND-BY key (or take no action for 60 s) to exit the procedure.

5.3 Displaying/deleting the compressor functioning hours

Check that the keypad is not locked.

1.	FNC ∨	Touch the DOWN key for 1 s.
2.	FNC ∧ ☼ ↑	Touch the UP or DOWN key within 15 s to select a label.

LAB.	DESCRIPTION
CH1	view compressor functioning hours (days)
CH2	view compressor 2 functioning hours (days) (if u1c... u5c = 1)
rCH	delete compressor and compressor 2 functioning hours

3.	SET	Touch the SET key.
4.	FNC ∧ ☼ ↑	Touch the UP or DOWN key to set "**149**" (to select **rCH**).
5.	SET	Touch the SET key.
6.	⏻	Touch the ON/STAND-BY key (or take no action for 60 s) to exit the procedure.

5.4 Viewing the temperature detected by the probes

Check that the keypad is not locked.

1.	FNC ∨	Touch the DOWN key for 1 s.
2.	FNC ∧ ☼ ↑	Touch the UP or DOWN key within 15 s to select a label.

LAB.	DESCRIPTION
Pb1	cabinet temperature (if P4 = 0, 1, 2 or 4)
	incoming air temperature (if P4 = 3)
Pb2	evaporator temperature (if P3 = 1 or 2)
Pb3	auxiliary temperature (if P4 = 1, 2, 3 or 4)
Pb4	calculated product temperature (CPT; if P4 = 3)

3.	SET	Touch the SET key.
4.	⏻	Touch the ON/STAND-BY key (or take no action for 60 s) to exit the procedure.

6 SETTINGS

6.1 Setting configuration parameters

1.	SET	Touch the SET key for 4 s: the display will show the label "**PA**".
2.	SET	Touch the SET key.
3.	FNC ∧ ☼ ↑	Touch the UP or DOWN key within 15 s to set the PAS value (default "**-19**").
4.	SET	Touch the SET key (or take no action for 15 s): the display will show the label "**SP**".
5.	FNC ∧ ☼ ↑	Touch the UP or DOWN key to select a parameter.
6.	SET	Touch the SET key.
7.	FNC ∧ ☼ ↑	Touch the UP or DOWN key within 15 s to set the value.
8.	SET	Touch the SET key (or take no action for 15 s).
9.	SET	Touch the SET key for 4 s (or take no action for 60 s) to exit the procedure.

6.2 Setting the date, time and day of the week (if the EVIF25TBX, EVIF25TWX or EVIF23TSX module is connected)

N.B.
- do not disconnect the device from the mains in the two minutes after setting the date, time and day of the week
- if the device communicates with the EVconnect app or the EPoCA remote monitoring system, the date, time and day of the week will be automatically set by the smartphone or tablet.

Check that the keypad is not locked.

1.	FNC ∨	Touch the DOWN key for 4 s.
2.	FNC ∧ ☼ ↑	Touch the UP or DOWN key within 15 s to select the label "**rtc**".
3.	SET	Touch the SET key: the display will show the label "**yy**" followed by the last two figures of the year.
4.	FNC ∧ ☼ ↑	Touch the UP or DOWN key within 15 s to set the year.
5.	Repeat actions 3 and 4 to set the next labels.	

LAB.	MEANING OF THE NUMBERS FOLLOWING THE LABEL
n	month (01... 12)
d	day (01... 31)
h	hour (00... 23)
n	minutes (00... 59)

6.	SET	Touch the SET key: the display will show the label for the day of the week.
7.	FNC ∧ ☼ ↑	Touch the UP or DOWN key within 15 s to set the day of the week.

LAB.	DESCRIPTION
Mon	Monday
tuE	Tuesday
UEd	Wednesday
thu	Thursday
Fri	Friday
Sat	Saturday
Sun	Sunday

8.	SET	Touch the SET key: the device will exit the procedure.
9.	⏻	Touch the ON/STAND-BY key to exit the procedure beforehand.

6.3 Restoring factory (default) settings

N.B.
- check that the factory settings are appropriate; see the section *CONFIGURATION PARAMETERS*.
- saving customised settings overwrites the factory settings.

1.	SET	Touch the SET key for 4 s: the display will show the label "**PA**".
2.	SET	Touch the SET key.
3.	FNC ∧ ☼ ↑	Touch the UP or DOWN key within 15 s to set the value.

VAL.	MEANING
149	value for restoring the factory information (default)

4.	SET	Touch the SET key (or take no action for 15 s): the display will show the label "**dEF**".
5.	SET	Touch the SET key.
6.	FNC ∧ ☼ ↑	Touch the UP or DOWN key within 15 s to set "**4**".
7.	SET	Touch the SET key (or take no action for 15 s): the display will show "**- - -**" flashing for 4 s, after which the device will exit the procedure.
8.	Disconnect the device from the power supply.	
9.	SET	Touch the SET key for 2 s before action 6 to exit the procedure beforehand.

7 CONFIGURATION PARAMETERS

N.B.
- parameters having column "PAR." in grey are not available for EV3SB22
- parameters having column "DEF." in grey are only available for EV3SB54.

NO.	PAR.	DEF.	SETPOINT	MIN... MAX.
1	SP	**0.0**	setpoint	r1... r2
NO.	**PAR.**	**DEF.**	**ANALOGUE INPUTS**	**MIN... MAX.**
2	CA1	**0.0**	cabinet probe offset	-25... 25 °C/°F if P4 = 3, incoming air probe offset
3	CA2	**0.0**	evaporator probe offset	-25... 25 °C/°F
4	CA3	**0.0**	auxiliary probe offset	-25... 25 °C/°F
5	P0	**1**	type of probe	0 = PTC 1 = NTC
6	P1	**1**	enable decimal point °C	0 = no 1 = yes
7	P2	**0**	temperature measurement unit	0 = °C 1 = °F
8	P3	**1**	evaporator probe function	0 = disabled 1 = defrost + fans 2 = fans 3 = digital input option 3 only available for EV3SB22
9	P4	**0**	configurable input function	0 = digital input 1 = condenser probe 2 = critical temp. probe 3 = outgoing air probe 4 = evaporator probe 2 if P4 = 3, regulation temperature = product temperature (CPT)
10	P5	**0**	value displayed	0 = regulation temperature 1 = setpoint 2 = evaporator temp. 3 = auxiliary temperature 4 = incoming air temperature
11	P7	**50**	incoming air effect to calculate product temperature (CPT)	0... 100 % CPT = {[(P7 x (incoming air)] + [(100 - P7) x (outgoing air)] : 100}
12	P8	**5**	display refresh time	0... 250 s: 10
NO.	**PAR.**	**DEF.**	**REGULATION**	**MIN... MAX.**
13	r0	**2.0**	setpoint differential	1... 15 °C/°F if u1c... u5c 1, proportional band if Ao1 = 0... 3 or u5c = 0, band compressor off (relative to setpoint or setpoint - r0)
14	r1	**-40**	minimum setpoint	-99 °C/°F... r2
15	r2	**50.0**	maximum setpoint	r1... 199 °C/°F
16	r3	**0**	enable setpoint lock	0 = no 1 = yes
17	r4	**0.0**	setpoint offset in energy saving	0... 99 °C/°F
18	r5	**0**	hot or cold mode regulation	0 = cold mode 1 = hot mode
19	r6	**0.0**	setpoint offset in overcooling/overheating	0... 99 °C/°F
20	r7	**0**	duration overcooling/overheating	0... 240 min
21	r8	**2**	DOWN key additional function	0 = disabled 1 = overcooling/overheating 2 = energy saving
22	r12	**1**	differential position r0	0 = asymmetrical 1 = symmetrical
23	r13	**25.0**	proportional band modulating regulation (relative to setpoint)	0... 99 °C/°F setpoint + r13 for Ao1 = 0... 3 or u5c = 0
24	r14	**10**	integral action time modulating regulation	0... 99 min
25	r15	**3**	type of PWM compressor	1 = Embraco VEM 2 = Embraco VEG 3 = Embraco VNEK and VNEU 4 = Secop VNL 5 = Secop 33... 133 Hz not visible if r13 = 0
26	r16	**0**	percentage 0-10 V output for compressor with minimum capacity	0 %... r17
27	r17	**100**	percentage 0-10 V output for compressor with maximum capacity	r6... 100 % not visible if r13 = 0
28	r18	**0**	maximum percentage modulating regulation in energy saving	0... 100 % 0 = disabled not visible if r13 = 0
NO.	**PAR.**	**DEF.**	**COMPRESSOR**	**MIN... MAX.**
29	CP0	**0**	85 Hz PWM compressor time from power-on	0... 100 s x 10 not visible if r13 = 0
30	CP1	**50**	percentage 0-10 V compressor from power-on	0... 100 % not visible if r13 = 0
31	CP3	**100**	percentage 0-10 V compressor in cabinet probe alarm	0... 100 % not visible if r13 = 0
32	CP4	**0**	maximum 0-10 V compressor-on time	0... 240 min not visible if r13 = 0
33	C0	**0**	compressor-on delay from power-on	0... 240 min
34	C1	**5**	delay between two compressor switch-ons	0... 240 min
35	C2	**3**	minimum compressor-off time	0... 240 min
36	C3	**0**	minimum compressor-on time	0... 240 s
37	C4	**10**	compressor-off time in cabinet probe alarm	0... 240 min
38	C5	**10**	compressor-on time in cabinet probe alarm	0... 240 min
39	C6	**80.0**	high condensation signal threshold	0... 199 °C/°F differential = 2 °C/4 °F
40	C7	**90.0**	high condensation alarm threshold	0... 199 °C/°F
41	C8	**1**	high condensation alarm delay	0... 15 min
42	C9	**5**	cabinet temperature consecutive time within proportional band to operate compressor at max. power	0... 99 h 0 = disabled until cabinet temperature < setpoint
43	C10	**0**	compressor days for maintenance	0... 999 days 0 = disabled
44	C11	**10**	compressor 2 on delay	0... 240 s
45	C12	**2**	compressor hour value effect to balance hours and switch-ons (BHC)	0... 10 BHC = {[C12 x (compressor hours)] + [C13 x (compressor switch-ons)]}
46	C13	**1**	compressor switch-ons value effect to balance hours and switch-ons (BHC)	0... 10 BHC = {[C12 x (compressor hours)] + [C13 x (compressor switch-ons)]}
47	C14	**1**	constraint between compressors	0 = function of C11 1 = function of r0 2 = function of C12 and C13
NO.	**PAR.**	**DEF.**	**DEFROSTING (if r5 = 0)**	**MIN... MAX.**
48	d00	**0**	enable "b" mode parameters on setpoint threshold	0 = no 1 = yes
49	d01	**1.0**	setpoint threshold to activate "b" mode parameters	r1... r2 activated if setpoint > d01
50	d0	**8**	automatic defrost interval	0... 99 h 0 = manual only if d8 = 3, maximum interval
51	d0b	**6**	automatic defrost interval "b" mode	like d0
52	d1	**0**	type of defrost	0 = electric 1 = hot gas (do not use with regulation with 2 compressors) 2 = compressor stopped
53	d1b	**2**	type of defrost "b" mode	like d1
54	d2	**2.0**	defrost end threshold	-99... 99 °C/°F
55	d2b	**4.0**	defrost end threshold "b" mode	like d2
56	d3	**30**	defrost duration	0... 99 min if P3 = 1, maximum duration
57	d3b	**20**	defrost duration "b" mode	like d3
58	d4	**0**	enable defrost at power-on	0 = no 1 = yes
59	d5	**0**	defrost delay from power-on	0... 99 min
60	d6	**1**	value displayed when defrosting	0 = regulation temperature 1 = locked display 2 = label dEF
61	d7	**2**	dripping time	0... 15 min
62	d7b	**0**	dripping time "b" mode	like d7
63	d8	**0**	defrost interval count mode	0 = hours device on 1 = hours compressor on 2 = hours evaporator temperature < d9 3 = adaptive 4 = in real time
64	d9	**0.0**	evaporation threshold for automatic defrost interval count	-99... 99 °C/°F
65	d11	**0**	enable defrost timeout alarm	0 = no 1 = yes
66	d15	**0**	compressor-on consecutive time for hot gas defrost	-20... 99 min if values are negative, dripping heaters on time
67	d16	**0**	pre-dripping time for hot gas defrost	0... 99 min
68	d18	**40**	adaptive defrost interval	0... 999 min if compressor on + evaporator temperature < d22 0 = manual only
69	d19	**3.0**	adaptive defrost threshold (relative to optimal evaporation temperature)	0... 40 °C/°F optimal evaporation temperature - d19
70	d20	**180**	compressor-on consecutive time for defrost	0... 999 min 0 = disabled
71	d21	**200**	compressor-on consecutive time for defrost from power-on and from overcooling	0... 500 min if (regulation temperature - setpoint) > 10°C/20 °F 0 = disabled
72	d22	**-2.0**	evaporation threshold for adaptive defrost interval count (relative to optimal evaporation temperature)	-10... 10 °C/°F optimal evaporation temperature + d22
73	d25	**0**	enable outgoing air probe for defrost in evaporator probe alarm	0 = no 1 = yes
74	d26	**6**	defrost interval in evaporator probe alarm	0... 99 h 0 = manual only if d25 = 1
NO.	**PAR.**	**DEF.**	**ALARMS**	**MIN... MAX.**
75	A0	**0**	select value for high/low temperature alarms	0 = regulation temperature 1 = evap. temperature 2 = auxiliary temperature
76	A1	**0.0**	low temperature alarm threshold	-99... 99 °C/°F
77	A2	**0**	type of low temperature alarm	0 = disabled 1 = relative to setpoint 2 = absolute
78	A4	**0.0**	high temperature alarm threshold	-99... 99 °C/°F
79	A5	**0**	type of high temperature alarm	0 = disabled 1 = relative to setpoint 2 = absolute
80	A6	**120**	high temperature alarm delay from power-on	0... 240 min
81	A7	**15**	high/low temperature alarm delay	0... 240 min
82	A8	**15**	high temperature alarm delay post-defrosting	0... 240 min
83	A9	**15**	high temperature alarm delay from door closure	0... 240 min
84	A10	**10**	duration of power failure for showing/saving alarm	0... 240 min 0 = disabled
85	A11	**2.0**	high/low temperature alarm reset differential	1... 15 °C/°F
86	A12	**1**	type of power failure alarm signal	0 = disabled 1 = LED HACCP + label PF + buzzer (if duration > A10)
NO.	**PAR.**	**DEF.**	**FANS**	**MIN... MAX.**
87	F0	**1**	evaporator fan mode in normal function	0 = off 1 = on 2 = on if compressor on 3 = thermoregulated (with regulation temperature + F1) 4 = thermoregulated (with regulation temperature + F1) if compressor on 5 = function of F6 6 = thermoregulated (with F1) 7 = thermoregulated (with F1) if compressor on
88	F0b	**1**	evaporator fan mode in normal function "b" mode	like F0
89	F1	**-4.0**	evaporator fans regulation threshold	-99... 99 °C/°F default -1.0 for EV3SB22
90	F2	**0**	evaporator fan mode in defrost and drip mode	0 = off 1 = on 2 = function of F0 default 1 for EV3SB22
91	F2b	**0**	evaporator fan mode in defrost and drip mode	like F2
92	F3	**2**	maximum time evaporator fans off	0... 15 min default 0 for EV3SB22
93	F3b	**2**	maximum time evaporator fans off	like F3
94	F4	**30**	time evaporator fans off in energy saving	0... 240 s x 10 if F0 ≠ 5
95	F5	**30**	time evaporator fans on in energy saving	0... 240 s x 10 if F0 ≠ 5
96	F6	**0**	function for high/low humidity	0 = for low humidity (with F17 and F18 if compressor off, on if compressor on) 1 = for high humidity (on)
97	F7	**5.0**	evaporator fans on threshold from dripping (relative to setpoint)	-99... 99 °C/°F setpoint + F7
98	F8	**2.0**	evaporator fans regulation threshold differential	1... 15 °C/°F
99	F9	**10**	evaporator fans off delay from compressor off	0... 240 s if F0 = 2 or 5
100	F11	**15.0**	condenser fans on threshold	0... 99 °C/°F

101	F12	**30**	condenser fans off delay from compressor off	0... 240 s if P4 ≠ 1
102	F13	**2**	condenser fans regulation threshold differential	1... 25 °C/°F 0-10 V condenser fans proportional band if Ao1 = 2 (relative to F11, F11 + F13)
103	F14	**10**	100 % start-up time for 0-10 V condenser fans	0... 240 s
104	F15	**100**	maximum percentage 0-10 V condenser fans in energy saving	0... 100 %
105	F17	**60**	time evaporator fans off in low humidity	0... 240 s if u1c... u5c = 16, activates speed 2 evaporator fans
106	F18	**10**	time evaporator fans on in low humidity	0... 240 s
107	F19	**0**	interval activation reversible condenser fans	0... 240 h
108	F20	**0**	reversible condenser fans on time	0... 240 min
109	F30	**0**	setting percentage 0-10 V evaporator fans in normal function mode	0 = touch SET key twice 1 = with F33 2 = automatic with F1, F31, F32 and F36
110	F31	**50**	percentage 0-10 V output for evaporator fans with minimum capacity	0... 100 % if F31>F32, F32 is relevant
111	F32	**100**	percentage 0-10 V output for evaporator fans with maximum capacity	0... 100 % if F32<F31, F31 is relevant
112	F33	**100**	percentage 0-10 V evaporator fans in normal function	F31... F32
113	F34	**10**	Start up time 0-10 V evaporator fans at F35	0... 240 s
114	F35	**100**	percentage 0-10 V evaporator fans from power-on	0... 100%
115	F36	**10**	0-10 V evaporator fans proportional band (relative to setpoint)	1... 25 °C/°F setpoint+F36
116	F37	**0**	maximum percentage 0-10 V evaporator fans in energy saving	0... 100%

NO.	PAR.	DEF.	DIGITAL INPUTS	MIN... MAX.
117	i0	**5**	door switch input function	0 = disabled 1 = compressor + evaporator fans off 2 = evaporator fans off 3 = cabinet light on 4 = compressor + evaporator fans off, cabinet light on 5 = evaporator fans off, cabinet light on
118	i1	**0**	door switch input activation	0 = with contact closed 1 = with contact open
119	i2	**30**	door open alarm delay	-1... 120 min -1 = disabled
120	i3	**15**	maximum time for inhibiting regulation with door open	-1... 120 min -1 = until closed
121	i5	**0**	multi-purpose input function	0 = disabled 1 = energy saving 2 = alarm iA 3 = alarm iSd 4 = load 1 operated by on key 5 = load 2 operated by on key 6 = switches device on/off 7 = alarm LP 8 = alarm C1t 9 = alarm C2t
122	i6	**0**	multi-purpose input activation	0 = with contact closed 1 = with contact open
123	i7	**0**	multi-purpose input alarm delay	0... 120 min if i5 = 3 or 7, compressor on delay from alarm reset
124	i8	**0**	number of multi-purpose input activations for high pressure alarm	0... 15 0 = disabled if i5 = 3
125	i9	**240**	counter reset time for high pressure alarm	1... 999 min
126	i10	**0**	door closed consecutive time for energy saving	0... 999 min after cabinet temperature < SP 0 = disabled
127	i13	**180**	number of door openings for defrost	0... 240 0 = disabled
128	i14	**32**	door open consecutive time for defrost	0... 240 min 0 = disabled

NO.	PAR.	DEF.	DIGITAL OUTPUTS	MIN... MAX.
129	u1c	**0**	K1 relay configuration	0 = compressor 1 1 = compressor 2 2 = evaporator fans 3 = condenser fans 4 = defrosting 5 = cabinet light 6 = demisting 7 = door heaters 8 = heaters for neutral zone 9 = dripping heaters 10= button-operated load 1 11= button-operated load 2 12= alarm 13= on/stand-by 14= evaporator fans 2 15= defrosting 2 16= speed 2 evaporator fans 17= reversible cond. fans 18= speed 2 cond. fans
130	u2c	**2**	K2 relay configuration	like u1c
131	u3c	**4**	K3 relay configuration	like u1c
132	u4c	**5**	K4 relay configuration	like u1c
133	u5c	**3**	K5 relay configuration	0 = PWM compressor 1... 18 like u1c
134	u2	**0**	enable cabinet light and load in stand-by using the key	0 = no 1 = yes in manual mode
135	u3	**0**	alarm relay activation	0 = with alarm not active 1 = with alarm active
136	u4	**1**	enable silencing alarm output	0 = no 1 = yes
137	u5	**-1.0**	door heaters on threshold	-99... 99 °C/°F
138	u5d	**2.0**	door heaters on threshold differential	1... 25 °C/°F
139	u6	**5**	duration demisting on	1... 120 min 1 = on/off by pressing key
140	u7	**-5.0**	neutral zone for heating threshold (relative to setpoint)	-99... 99 °C/°F differential = 2 °C/4 °F setpoint + u7
141	u9	**1**	enable alarm buzzer	0 = no 1 = yes

NO.	PAR.	DEF.	ANALOGUE OUTPUTS	MIN... MAX.
142	Ao1	**5**	analogue output configuration	0 = PWM compressor (r15) 1 = 0-10 V compressor 2 = 0-10 V cond. fans 3 = 0-10 V evap. fans 4 = disabled 5 = disabled

NO.	PAR.	DEF.	CLOCK	MIN... MAX.
143	Hr0	**0**	enable clock	0 = no 1 = yes

NO.	PAR.	DEF.	ENERGY SAVING (if r5 = 0)	MIN... MAX.
144	HE2	**0**	maximum duration energy saving	0... 999 min 0 = until door opened

NO.	PAR.	DEF.	ENERGY SAVING IN REAL TIME (if r5 = 0; visible if Hr0=1)	MIN... MAX.
145	H01	**0**	energy saving time	0... 23 h
146	H02	**0**	maximum duration energy saving	0... 24 h

NO.	PAR.	DEF.	SWITCHING ON/OFF IN REAL TIME (visible if Hr0=1)	MIN... MAX.
147	Hon	**h-**	time device switch-on	0... h- h- = disabled
148	HoF	**h-**	time device switch-off	0... h- h- = disabled
149	Hc1	**h-**	1st time reversible condenser fans on	0... h- h- = disabled for time F20
150	Hc2	**h-**	2nd time reversible condenser fans on	0... h- h- = disabled for time F20

NO.	PAR.	DEF.	DEFROSTING IN REAL TIME (if d8 = 4; visible if Hr0=1)	MIN... MAX.
151	Hd1	**h-**	1st daily defrosting time	0... h- h- = disabled
152	Hd2	**h-**	2nd daily defrosting time	0... h- h- = disabled
153	Hd3	**h-**	3rd daily defrosting time	0... h- h- = disabled
154	Hd4	**h-**	4th daily defrosting time	0... h- h- = disabled
155	Hd5	**h-**	5th daily defrosting time	0... h- h- = disabled
156	Hd6	**h-**	6th daily defrosting time	0... h- h- = disabled

NO.	PAR.	DEF.	SECURITY	MIN... MAX.
157	POF	**1**	enable ON/STAND-BY key	0 = no 1 = yes
158	Loc	**1**	enable keypad lock	0 = no 1 = yes
159	PAS	**-19**	password	-99... 999
160	PA1	**426**	1st level password	-99... 999
161	PA2	**824**	2nd level password	-99... 999

NO.	PAR.	DEF.	EVLINK DATA-LOGGING (visible if Hr0=1)	MIN... MAX.
162	rE0	**15**	data logger sampling interval	0... 240 min
163	rE1	**1**	select temperature for data logger	0 = none 1 = cabinet 2 = evaporator 3 = auxiliary 4 = cabinet and evaporator 5 = all

NO.	PAR.	DEF.	MODBUS	MIN... MAX.
164	LA	**247**	MODBUS address	1... 247
165	Lb	**2**	MODBUS baud rate	0 = 2,400 baud 1 = 4,800 baud 2 = 9,600 baud 3 = 19,200 baud
166	LP	**2**	MODBUS parity	0 = none 1 = odd 2 = even

NO.	PAR.	DEF.	EVLINK	MIN... MAX.
167	bLE	**1**	serial port configuration for connectivity	0 = free 1 = forced for EVconnect or EPoCA 2-99 = EPoCA local network address

8 ALARMS

CODE	MEANING	RESET	TO CORRECT
Pr1	cabinet probe alarm	automatic	- check P0
Pr2	evaporator probe alarm	automatic	- check the integrity of the probe
Pr3	auxiliary probe alarm	automatic	- check electrical connection
rtc	clock alarm	manual	set date, time and day of the week
ErL	user interface-control module electrical connection alarm	automatic	check the electrical connection
AL	low temperature alarm	automatic	check A0, A1 and A2
AH	high temperature alarm	automatic	check A4 and A5
id	door open alarm	automatic	check i0 and i1
PF	power failure alarm	manual	- touch a key - check electrical connection
COH	high condensation signal	automatic	check C6
CSd	high condensation alarm	manual	- switch the device off and on - check C7
iA	multi-purpose input alarm	automatic	check i5 and i6
iSd	high pressure alarm	manual	- switch the device off and on - check i5, i6, i8, i9
LP	low pressure alarm	automatic	check i5 and i6
C1t	compressor thermal switch alarm	automatic	check i5 and i6
C2t	compressor 2 thermal switch alarm	automatic	check i5 and i6
dFd	defrost timeout alarm	manual	- touch a key - check d2, d3 and d11

9 TECHNICAL SPECIFICATIONS

Purpose of the control device:	function controller.
Construction of the control device:	built-in electronic device.
Housing:	
user interface: black, self-extinguishing	control module: open frame board.
Category of heat and fire resistance:	D.
Measurements:	
user interface: 75.0 x 33.0 x 39.5 mm (2 15/16 x 1 5/16 x 1 9/16 in)	control module: 66.5 x 107.5 x 31.0 mm (2 5/8 x 4 1/4 x 1 1/4 in).
Mounting methods for the control device:	
user interface: to be fitted to a panel, snap-in brackets provided	control module: to be installed on an electrical panel, on plastic spacers (not provided).
Degree of protection provided by the casing:	
user interface: IP65 (front)	control module: IP00.
Connection method:	
user interface: plug-in screw terminal blocks for wires up to 2.5 mm²	control module: - fixed screw terminal blocks for wires up to 2.5 mm² - Pico-Blade connector.
Maximum permitted length for connection cables:	
user-interface-control module: 10 m (32.8 ft)	power supply: 10 m (32.8 ft)
analogue inputs: 10 m (32.8 ft)	digital inputs: 10 m (32.8 ft)
analogue outputs: 3 m (9.84 ft)	digital outputs: 10 m (32.8 ft).
Operating temperature:	from 0 to 60 °C (from 32 to 140 °F)
Storage temperature:	from -25 to 70 °C (from -13 to 158 °F).
Operating humidity:	relative humidity without condensate from 10 to 90%.
Pollution status of the control device:	2.
Compliance:	

RoHS 2011/65/EC	WEEE 2012/19/EU	REACH (EC) Regulation no. 1907/2006
EMC 2014/30/EU	LVD 2014/35/EU.	

Power supply:		
user interface: powered by the control module		control module: - 230 VAC (+10% -15%), 50/60 Hz (±3 Hz), max. 2 VA insulated in EV3SB22N7 and EV3SB24N7 - 115... 230 VAC (+10 % -15%), 50/60 Hz (±3 Hz), max. 3.2 VA insulated in EV3SB54N9.
Earthing methods for the control device:		none.
Rated impulse-withstand voltage:		- 4 KV in EV3SB22N7 and EV3SB24N7 - 2.5 KV in EV3SB54N9.
Over-voltage category:		- III in EV3SB22N7 and EV3SB24N7 - II in EV3SB54N9.
Software class and structure:		A.
Analogue inputs:		- 1 for PTC or NTC probes (cabinet probe) in EV3SB22 - 2 for PTC or NTC probes (cabinet probe and evaporator probe) in EV3SB24 and EV3SB54
PTC probes:	Type of sensor:	KTY 81-121 (990 Ω @ 25 °C, 77 °F)
	Measurement field:	from -50 to 150 °C (from -58 to 302 °F)
	Resolution:	0.1 °C (1 °F).
NTC probes:	Type of sensor:	ß3435 (10 KΩ @ 25 °C, 77 °F)
	Measurement field:	from -40 to 105 °C (from -40 to 221 °F)
	Resolution:	0.1 °C (1 °F).
Digital inputs:		1 dry contact (door switch); not available for EV3SB22.
Other inputs:		- 1 input can be configured for analogue input (evaporator probe) or digital input (door switch, dry contact) for EV3SB22 - 1 input can be configured for analogue input (auxiliary probe) or digital input (multi-purpose, dry contact) for EV3SB24 and EV3SB54
Contact dry:	Type of contact:	5 VDC, 1.5 mA
	Power supply:	none
	Protection:	none.
Analogue outputs:		1 for PWM or 0-10 V signal (compressor inverter; only available for EV3SB54).
Other outputs:		1 for 12 VDC max. 30 mA (only available for EV3SB54).
Signal PWM:	Power supply:	12 VDC (+16 % -25 %), 20 mA max.
	Frequency:	0... 150 Hz
	Protection:	none.
0-10 V Signal:	Minimum applicable impedance:	1 KΩ
	Resolution:	0.01 V
Digital outputs:		- 2 with sealed electro-mechanical relay in compliance with the EN 60079-15 standard in EV3SB22 - 4 with sealed electro-mechanical relay in compliance with the EN 60079-15 standard in EV3SB24 and EV3SB54.
K1 relay:		SPST, 16 A res. @ 250 VAC.
K2 relay:		SPST, 5 A res. @ 250 VAC (not available for EV3SB22).
K3 relay:		SPDT, 8 A res. @ 250 VAC (not available for EV3SB22).
K4 relay:		SPDT, 16 A res. @ 250 VAC.
Type 1 or Type 2 actions:		type 1.
Additional features of Type 1 or Type 2 actions:		C.
Displays:		custom display, 3 digit, with function icons.
Alarm buzzer:		built-in.
Communications ports:		1 TTL MODBUS slave port for EVJKEY programming key, EVconnect app, EPoCA remote monitoring system or for BMS.

N.B.
The device must be disposed of according to local regulations governing the collection of electrical and electronic equipment.

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