

User manual for:

Manufacturer	Model
Interlevin	AT03 ISO
	AT05 ISO
	AT07 ISO
	AT10 ISO

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ABBATTITORI Controllori per abbattitori con tastiera Touch capacitiva BLAST CHILLERS/SHOCK FREZERS Controllers for blast chillers with capacitive Touch keypad

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I. INTRODUCTION

I.I. HOW TO USE THIS MANUAL

This manual uses the following conventions to highlight certain parts of the text:



Information that users must be aware of to prevent any damage to the system or hazards for people, devices, data, etc. Users must read and take note of these sections.

Indicates further information on the subject concerned that the user should take into account.



Fig. IProvides references to figures. References to figures indicated by using, in bold, the abbreviation 'Fig.' and a numberI - Fig. Ithat identifies the figure. To indicate specific parts within the figure, the references are given using a letter or number.

'I.I.I Title' on page I
 Provides references to parts of the text. References to parts of the text are indicated using, in bold, the number and the title of the chapter, subchapter, paragraph or sub-paragraph in quotation marks, followed by 'on page' with the corresponding page number.

I.I.I. Glossary

BLAST CHILLING

Process by which the temperature of the food products is lowered abruptly, cooling or freezing them. The sudden drop in temperature ensures compliance with the organoleptic qualities of the food product, which can then be stored. It is divided into:

- · Positive blast chilling, or blast chilling correctly called cooling;
- Negative blast chilling, or blast chilling correctly called freezing.

BLAST CHILLER

Machine used to run the blast chilling cycle and the subsequent storage of a food product.

STORAGE

Next step in the blast chilling cycle, in which the food product is maintained at a certain temperature in order to preserve its cooling or freezing.

It is divided into:

- · Positive storage, in the case of cooling;
- Negative storage, in the case of freezing.

DEFROST

Process of ice and frost accumulations removal from the inner walls of the refrigeration plants.

'OPEN' BOARD Board without protective casing.

COLD ROOM SET POINT

Constant temperature value at which the cold room is maintained during the blast chilling cycle.

NEEDLE PROBE

Type of probe with 'needle' shape (Fig. I on page 49) that allows to pierce a food product to detect the temperature of its core.



Fig. I. Needle probe

STAND-BY STATUS

Status in which the blast chiller is not running a program or function, and the user interface is switched off.

STOP STATUS

Status in which the blast chiller is not running a program or function, and the user interface is switched on and enabled.

STERILIZATION

Chemical or physical process that leads to the elimination of every living organism, both pathogenic and non-pathogenic, including spores and fungi. It is typically implemented through the use of a UV (Ultra Violet) lamp, i.e. that emits ultraviolet rays.

NEEDLE PROBE TARGET (CORE)

Temperature value, measured by the needle probe (core), at which the blast chilling cycle stops and the storage phase begins.

I.2. DISCLAIMER

This document is the exclusive property of Eliwell Controls and may not be reproduced or circulated unless expressly authorised by Eliwell Controls itself.

Every care has been taken in the preparation of this manual; however Eliwell Controls srl and any person or company involved in its creation and writing cannot accept any liability arising from the use thereof.

Eliwell Controls srl reserves the right to make changes or improvements at any time without notice.

1.3. LIABILITY AND RESIDUAL RISKS

Eliwell Controls srl declines any liability for damage due to:

- unspecified installation/use and, in particular, in contravention of the safety requirements of the legislation in force in the Country of installation and/or specified in this document;
- use on blast chillers which do not provide adequate protection against electrocution, water and dust in the actual installation conditions;
- use on blast chillers allowing access to dangerous parts without having to use tools;
- · tampering with and/or modification of the product;
- installation/use on blast chillers that do not comply with the regulations in force in the Country of installation.

I.4. CONDITIONS OF USE

I.4.I. Permitted use

This product should be used to control professional blast chillers.

For safety reasons, the product must be installed and used in accordance with the instructions provided. In particular, parts carrying dangerous voltages must not be accessible under normal conditions. It must be adequately protected from water and dust according to the application, and must be accessible only using a tool.

The product is suitable for use in a blast chiller for professional refrigeration appliances and has been tested for safety aspects in accordance with the harmonized European reference standards.

I.4.2. Prohibited use

Any use other than that expressly permitted is prohibited.

The relay contacts provided are mechanical and subject to failure: any protection devices required by reference standards, or suggested by good practice in view of obvious safety requirements, must be installed externally of the product.

I.5. DISPOSAL



The equipment (or product) must be subjected to separate waste collection in compliance with the local legislation on waste disposal.

2. DESCRIPTION

EWBC800 (Fig. 2 on page 51) consists of an electronics control board, called the 'base', and a capacitive touch keypad with display, called the 'user interface'. **EWBC800** should be incorporated into Customer applications for controlling basic blast chiller functions. The base is supplied 'open', and is equipped with a microcontroller, inputs and outputs; the user interface is equipped with keys, LEDs and a display.



The technical specifications stated in this document regarding measurement (range, accuracy, resolution, etc.) refer to the instrument alone and not to any accessories provided, such as the probes. This means, for example, that the error introduced by the probe must be added to the characteristic error of the instrument.



Fig. 2. EWBC800: base and user interface

2.1. TECHNICAL SPECIFICATIONS (EN 60730-2-9)

2.1.1. Base technical data

	Range
Classification	Electronic automatic control device (not safety) device to be
	integrated
Installation	On panel
Type of action	I.B
Pollution class	2
Material class	Illa
Over voltage category	П
Nominal pulse voltage	2500 ∨
Ambient operating temperature	-5 - 55°C
Ambient storage temperature	-30 - 85°C
Operating environment and storage environment humidity (non-	10% - 90%
condensing)	
Power supply voltage	100 - 240 V~ +/-10% 50/60 Hz (switching)
Maximum consumption	5.5 W
Insulation class	2
Fire resistance category	D
Software class	A



The degree of protection (IP) to the User depends on the characteristics of the machine in which **EWBC800** is integrated. It has high voltage contacts and must therefore be protected against User access complying with the measures provided by the law in force in the Country where the unit is installed.

2.1.2. User interface technical data

	Range
Power supply voltage	From base
Insulation class	2
Ambient operating temperature	-5 - 55°C
Ambient storage temperature	-30 - 85°C
Operating environment and storage environment humidity (non-	10% - 90%
condensing)	

2.2. INPUT / OUTPUT / PORT CHARACTERISTICS

	#	Specifications		Description
	I	NOT configurable, set as PTC needle probe KTY 83 - 121 IK 1% (code SN7FAF11502A4)		Needle probe
A mala mua		Jointly configurable as PTC temperature probe KTY 83 - 121 IK 1% or as NTC temperature probe, Semitec type 103AT (10 kQ / 25°C)		Cold room probe
inputs	3			Evaporator probe (defrost)
		Range of use: -50 - +99.9°C	PB4	Condenser probe
			DI	Microswitch controlling
Digital	2	Voltage-free with closing current for ground (closing current for ground: 0.5 mA)		blast chiller door closure
mputs				Pressure switch
		Relay RI SPST, NO, 30 A, max. 250 Vac	OUTI	Default compressor
Digital outputs		Relay R2 SPDT, switching, 16 A, max. 250 Vac	OUT2	Default evaporator room fan
	5	Relay R3 SPDT, switching, 8 A, max. 250 Vac	OUT3	Default condenser fan
		Relay R4 SPST, NO, 8 A, max. 250 Vac	OUT4	Default door heating
		Opencollector OC for external relay connection, 12 Vdc, 20 mA	OUT5	Default NOT USED
Serial ports	2	TTL connector	TTL	Serial port
		Screw connector on base side; click-fit on keypad side, 3-way	KEYB	Serial port for connection between base and user interface

Ē

There is a buzzer.

Analogue Inputs



The probe can break if outside the usage range.

The resolution of the analogue inputs, according to Eliwell standard, is a tenth of a degree; the conversion precision is 1% FS (Full Scale). Accuracy is:



- ±1.0° for temperatures below -30°C
- ±0.5° for temperatures between -30°C and +25°C
- $\pm 1.0^{\circ}$ for temperatures above $\pm 25^{\circ}C$

Digital Outputs are configurable and can be assigned to the following functions:

Controlling the compressor, evaporator room fan, defrost heater, door heating, condenser fan, UV lamp, needle probe heating, room light



Fig. 3. Serial ports: TTL and KEYB

2.2.1. Buzzer

EWBC800 can produce two types of sound alerts:

- functional (alarm conditions, cycle stop, confirm, error, etc.), when the buzzer is managed by the base;
- to confirm key presses, only active for keys enabled for the specific application in progress, when the buzzer is managed with the user interface taking priority.



Key press confirmation tones last for 3 ms.

2.3. MECHANICAL INSTALLATION AND DIMENSIONS

Do not install **EWBC800** in places subject to high humidity and/or dirt; it is intended for use in sites with ordinary or normal levels of pollution. Keep the area around the chiller cooling slots adequately ventilated.

2.3.1. Base installation and dimensions

Base installation takes place inside the blast chiller, with plastic spacers applied to the holes (A - Fig. 4 on page 55) already present.



Fig. 4. Base installation and dimensions

2.3.2. User interface installation and dimensions

The user interface dimensions are given in Fig. 5 on page 56.





The user interface should be fitted (**Fig. 6 on page 56**) to a drilled and suitably outlined surface on the blast chiller. To install the user interface, proceed as follows:

- 1. clean the surface to remove any greasy, dusty or dirty residues;
- 2. remove the double-sided tape protection strip from the back of the user interface;
- 3. stick the user interface onto the drilled surface on the blast chiller;
- 4. remove the protective film from the front of the user interface.

The following conventions are used:

- the blast chiller is indicated in grey, the protective film is indicated in green,
 - the user interface is indicated in black and the double-sided tape protection strip is indicated in red.





2.4. ELECTRICAL CONNECTIONS



Always switch the blast chiller off before performing any maintenance on the electrical connections. Power up the blast chiller, base and user interface using the blast chiller main switch.

The **EWBC800** must be installed in compliance with the following requirements:

- the wiring must comply with the safety regulations and according to the procedures given below, so as not to compromise the **EWBC800** good stability with respect to electromagnetic interference;
- it is necessary to wire separately the sensor and power supply cables or use shielded cables to avoid interference phenomena;
- avoid the passage of wires (although isolated) above the EWBC800 (and particularly above the microcontroller).

2.4.1. Connector and terminal block specifications

	Specifications
Power supply, relay outputs	Faston connectors for cables with 2.5 mm ² cross-section
Analogue and digital inputs, opencollector digital	Screw-type terminal block for cables with a cross-section of 2.5 mm ²
output	
TTL	5-way connector
КЕҮВ	Screw-type terminal block for cables with a cross-section of 2.5 mm ²

2.4.2. Base and user interface connection

When electrically connecting the base and user interface, refer to **Fig. 7 on page 57**: only one user interface can be connected to the base, via a suitable polarised connector (**B**), which connects to that base by means of a serial port (**KEYB**).



The KEYB serial port consists of terminals 15, 16, 17. For a description of the terminals, refer to the table in **'2.4.3. Base con-**nection diagram'



The maximum distance of the electrical connection between the base and the user interface is 3 m.



Fig. 7. Base and user interface connection diagram

2.4.3. Base connection diagram

The connection diagram for **EWBC800** is illustrated in **Fig. 8 on page 59**, where the loads and analogue inputs are represented according to the symbolism described in the table below.



The loads shown in Fig. 8 on page 59 are the pre-set types described in '2.2. INPUT / OUTPUT / PORT CHARAC-TERISTICS' on page 53.

Symbol	Description
сомр	Compressor
CELL	Evaporator room fan
COND	Condenser fan
DOOR	Door heating
\mathbb{Z}^{\ast}	Needle probe
	Cold room probe
	Evaporator probe (defrost)
	Condenser probe
	Solid State Relay (SSR)

	Terminal	Naming	Description
Power supply	1-2	Ν	Neutral (Power supply)
	3	L	Phase (Power supply)
Relay digital	4	С	Common loads
outputs	5	NO2	Normally open (NO) contact for OUT2
	6	NC2	Normally closed (NC) contact for OUT2
	7	С	Common loads
	8	NC3	Normally closed (NC) contact for OUT3
	9	NO3	Normally open (NO) contact for OUT3
	10	С	Common loads
	11	NOI	Normally open (NO) contact for OUTI
	12	1	Terminal not used
	13	С	Common loads
	14	NO4	Normally open (NO) contact for OUT4
KEYB serial	15	GND	Ground for user interface
	16	D	Data signal for user interface
	17	12V	Power output at 12 Vdc for user interface
Digital/analogue	18	PBI	Needle probe
inputs	20	PB2	Cold room probe
	22	PB3	Evaporator probe (defrost)
	19-21-23	CPB	Probes common
	24	PB4	Condenser probe
	25	PB5	Pressure switch
	26	DI	Door closing control microswitch
	27	GND	Ground
	28 - 31	1	Terminals not used
Opencollector	32	OC	Signal for opencollector digital output
digital output	33	12V	12 Vdc power supply output for opencollector digital output



Fig. 8. Connection diagram example

3. USER INTERFACE

The user interface (Fig. 9 on page 60) consists of:

- a display (D),
- a keypad (**T**).



Fig. 9. User interface

3.1. DISPLAY

The display (D - Fig. 9 on page 60) features:

- 3 digits with sign and decimal point for viewing menus, operating variables, values and parameter labels;
- 8 icons for viewing units of measurement and blast chiller status.

3.1.1. Digits

The display (**D** - Fig. 9 on page 60) features 3 white digits, each formed of 7 segments, with a sign before the first digit and a decimal point before the last digit; it can be used to view menus, operating variables, values and parameter labels.

3.1.2. Icons

A description of the icons on the display (D - Fig. 9 on page 60) is provided in the table below.

lcon	Naming	Operation	Meaning
× V		Permanently on	Compressor on
XXX	Compressor	Switched off	Compressor off
		Permanently on	Defrost in progress
	Defrost	Blinking	Defrost required but not in progress (in progress at the next useful event)
		Switched off	Defrost off
	Evaporator room fan	Permanently on	Evaporator room fan on
	Evaporator room fan	Switched off	Evaporator room fan off
	Display time in min	Permanently on	Manual program in progress, a time is shown on the display
		Switched off	Manual program off
	() Alarm	Permanently on	Alarm present
		Switched off	Alarm absent
	Display temperature in °F	Permanently on	Automatic program in progress, a temperature in °F (degrees Fahrenheit) is shown on the display
AUX	AUX		Reserved
°C	Display temperature in °C	Permanently on	Automatic program in progress, a temperature in °C (degrees Centigrade) is shown on the display

3.2. KEYPAD

The keypad (T - Fig. 9 on page 60) consists of:

- 8 keys created using capacitive touch technology, for navigating menus, setting programs, configuring parameters, acknowledging alarms, etc.
- 12 LEDs for indicating the status of the blast chiller and the programs in progress,
- symbols.



If the keypad is locked, **EWBC800** ignores the pressing of any of the keys on the keypad. To unlock the keypad, press and hold any key for 7 sec.

3.2.1. Keys / LEDs

lcon	Description	Action	Function
***	TEMP key with 2 blue LEDs	Short press	In stop status, positive 🔀 (parameter tP) or negative 🌉 (parameter tn) blast chilling cycle selection, alternately. The corresponding LED comes on in accordance with the selected cycle While the blast chilling cycle is in progress, displays the
			current target value
			While a storage phase is in progress, displays the current storage set point value
	TARGET key with 2 blue LEDs	Short press	In stop status, manual 🐼 or automatic 🔀 blast chilling cycle selection, alternately. The corresponding LED comes on in accordance with the selected cycle
Ø ₽ ₽	MODE key with 2 blue LEDs	Short press	In stop status, soft real or hard real blast chilling cycle mode selection, alternately. The corresponding LED comes on in accordance with the selected mode
		Short press	Buzzer acknowledgment
\gg	DOWN key	Ē	In parameter configuration, scroll through parameters
		Short press	In parameter configuration, scroll through parameters
«	UP key	te de la companya de	value increase
	AUX key with 2 white LEDs	Short press	In stop status, special sterilization function a reedle probe heating selection alternately. The corresponding LED comes on in accordance with the selected program. In parameter configuration, display parameter or confirm displayed parameter value
		Long press	In stop status, deselection of any special function selected, deactivation of the corresponding LEDs, with restore to default setting (dFP parameter)
Ţ	ESC key with I white LED	Short press	In stop status, selection of optional functions defrost, manual storage, room light alternately and LED activation. In parameter configuration, confirm displayed parameter value, exit parameter configuration or return to previous level
		Long press	In stop status, deselection of any optional function selected, deactivation of the LED, with restore to default setting (dFP parameter)
START STOP	START/STOP key with I red LED	Short press	Start or stop the selected program or function, alternately
		Long press	In stop status, switch to stand-by status with LED activation. In stand-by status, switch to stop status with LED activation
TIMEOUT	TIMEOUT white LED	1	In automatic blast chilling cycle, lit and blinking indicates positive (parameter t1) or negative (parameter t2) timeout reached without the target temperature being reached (continues to blink during the following storage phase)
	RUNNING green LED	1	If lit, indicates defrost program in progress

lcon	Description	Action	Function
≈ + ≥	DOWN key and UP key	Long press (2 sec)	In stop status, simultaneously press the DOWN and UP keys for 2 seconds to access the configuration parameters.



The program is restored to its default setting (dFP parameter) through the display of LEDs corresponding to the **TEMP**, **TAR-GET**, **MODE** keys (refer to '3.3.4. Selecting and starting a program' on page 23).

3.2.2. Symbols

lcon	Icon Description			
×	To access the configuration parameters simultaneously press the DOWN and UP keys for at least 2 seconds			
CONSERVATION CONSE				
Blast chilling cycle selection keys				
FUNCTION	FUNCTION Function selection and program start keys			
⊥ SET	Single press of AUX key to select a special function			
	Press and hold AUX key to deselect a special function			
ESC	Single press of ESC to exit parameter configuration or return to previous level			

3.3. USER INTERFACE USE

3.3.1. First switch-on

The first time it is switched on, **EWBC800** is in stand-by: the display (**D** - **Fig. 9** on page 60) and the keypad LEDs (**T** - **Fig. 9** on page 60) are all off, except the LED for the **START/STOP** key.

Every time it is switched on subsequently, to set EWBC800 to stand-by, press and hold the START/STOP key for 4 sec.

3.3.2. Switching on after the first time

Every time it is switched on subsequently, or after the power supply has been restored, the user interface carries out a lamp-test (all segments, icons and LEDs blink for a few seconds); the **EWBC800** is then in the status indicated in the table below:

Case	Chill blast status before the power supply failure	Chill blast status at power supply restoration	
I	Blast chiller in stand-by	Blast chiller in stand-by, ready for startup with default settings	
		(dFP parameter = 0). The display will resume showing the same	
		information that appeared prior to the power supply being cut off	
2	Blast chiller running (program in progress), except in The blast chiller restarts program operation from the poir		
	the following case (3)	it was interrupted. The time count restarts from zero	
3	Blast chiller running (due to needle probe error the	Blast chiller resumes operation with automatic blast chilling cycle.	
	blast chilling cycle in progress is manual, initially it was	The time count restarts from zero.	
	automatic)	If the needle probe error persists after the reset, the blast chiller	
		resumes operation with a manual blast chilling cycle, lasting as long	
		as the timeout	

3.3.3. Operating principle

EWBC800 has **programs** for the management of the following blast chiller functions:

- automatic blast chilling,
- manual blast chilling.

The programs are divided into the following categories:

- positive program with soft blast chill mode,
- positive program with hard blast chill mode,
- negative program with soft blast chill mode,
- negative program with hard blast chill mode.

In a program, after a blast chilling there is a storage.

In the case of the automatic program, the reference value is the temperature detected by the needle probe.

In the case of the **manual program**, the reference value is the **time**. In this case blast chilling takes place within a specified time, regardless of the needle probe temperature which will adjust itself to the room temperature.

Both the automatic program and the manual program are constituted by a blast chilling cycle which is automatically followed by a storage phase, positive or negative depending on the blast chilling cycle performed.

The blast chilling cycle can be:

• positive (cooling), with positive reference temperature (target temperature), and soft blast chill mode (Fig. 10 on page 65);



The numeric values shown in Fig. 10 on page 21 are the default values.



• positive (cooling), with positive reference temperature (target temperature), and hard blast chill mode (Fig. 11 on page 65);

The numeric values shown in Fig. 11 on page 65 are the default values.



- Fig. 11. Positive program with hard blast chill mode
- negative (freezing), with negative reference temperature (target temperature), and hard blast chill mode (Fig. 12 on page 66);



The numeric values shown in Fig. 12 on page 66 are the default values.



Fig. 12. Negative program with hard blast chill mode

• negative (freezing), with negative reference temperature (target temperature), and soft blast chill mode (Fig. 13 on page 66).

The numeric values shown in Fig. 13 on page 66 are the default values.



Fig. 13. Negative program with soft blast chill mode

At the end of the blast chilling cycle, when the storage phase is started automatically, the buzzer will sound continuously for 2 seconds.

3.3.4. Selecting and starting a program

There are three keys on the left-hand side of the keypad (refer to '3.2. KEYPAD' on page 61); these can be used to configure

the blast chilling cycle by setting 3 criteria:

- blast chilling cycle target value. The **TEMP** key can be used to set a positive (freezing) or negative (deep-freezing) blast chilling cycle;
- blast chilling cycle target type. The **TARGET** key can be used to set an automatic or manual blast chilling cycle. The blast chilling duration is set in the manual blast chilling cycle, whereas in the automatic blast chilling cycle the duration is regulated until the target temperature for the needle probe has been reached;
- blast chilling mode. The **MODE** key can be used to set a blast chilling cycle that is hard (the temperature is lowered extremely rapidly) or soft (the temperature is lowered more slowly, avoiding incorrect freezing on the surface of the food to be cooled).

The combination of the three abovementioned criteria produces eight possible blast chilling cycles, summarised in the table below; depending on the blast chilling cycle set via the keypad, the dFP parameter assumes a value between 0 and 7.

In stop status (for example, when a program begins or ends), **EWBC800** automatically loads the settings for the blast chilling cycle that corresponds to the current value of the dFP parameter. If the dFP parameter is equal to 8 in stop status,

the first time it is switched on EWBC800 automatically loads the following pre-established settings:



- blast chilling cycle target value: positive,
 - blast chilling cycle target type: manual (timed),
- blast chilling mode: soft.
- every time it is switched on subsequently, EWBC800 automatically loads the blast chilling cycle settings for the last program carried out.

Blast chilling	Blast chilling cycle target	Blast chilling mode	Value of dFP	String shown on the	
cycle target value	type	8	parameter	display	
Positive	Manual (timed)	Hard	0	PMH	
		Soft	1	PMS	
	Automatic	Hard	2	PAH	
		Soft	3	PAS	
Negative	Manual (timed)	Hard	4	nMH	
		Soft	5	nMS	
	Automatic	Hard	6	nAH	
		Soft	7	nAS	
Previous retained	Previous retained	Previous retained	8	hLd	

A single press of one of the **TEMP**, **TARGET**, **MODE** keys prompts the display to show the corresponding configuration (blinks for three seconds).



The 3 listed criteria do not need to be set in order when configuring the program; each criterion takes account of the values currently set for the other two.

3.3.4.1. Selecting a blast chilling cycle target value

To select the blast chilling cycle target value (refer to **Fig. 14 on page 68**, if the blast chilling cycle target value is initially positive), proceed as follows:

I. Press **TEMP** until one of the tP and tn parameter values is displayed.



Pressing the **TEMP** key repeatedly (at consecutive intervals of less than 3 sec) changes the displayed data (**D** - **Fig. 9 on page 60**) alternately, from the value set for the positive blast chilling cycle to the value set for the negative blast chilling cycle; the LED corresponding to the **TEMP** key comes on simultaneously.

The numeric value of the parameter appears on the display, while the unit of measurement (°C or °F) appears as an icon alongside it.

2. Press UP and/or DOWN within 3 sec if you want to change the temperature.



This procedure does not change the default settings stored by the **EWBC800**. These settings are restored on completion of the program, or after it has been ended prematurely.

The tP parameter is limited at its lower end by the SPS parameter; the tn parameter is limited at its lower end by the Snh parameter.

The temperature set for **EWBC800** becomes the last temperature displayed, then the display reverts to showing the room temperature.



Fig. 14. Selecting a blast chilling cycle target value

To restore the blast chilling cycle target value to its default value (tP or tn parameter), press **TEMP** three times in succession.

3.3.4.2. Selecting a blast chilling cycle target type

To select the blast chilling cycle target type (refer to **Fig. 15 on page 69**, if the blast chilling cycle target type is initially manual), proceed as follows:

I. Press **TARGET** until you select one of the blast chilling cycle target types: manual or automatic.



Pressing the **TARGET** key repeatedly (at consecutive intervals of less than 3 sec) changes the displayed data (**D** - Fig. 9 on **page 60**), alternately, from the value set for the manual target type to the value set for the automatic target type; the LED corresponding to the **TARGET** key comes on simultaneously. If manual (timed), the cycle duration - expressed in minutes - is shown, with the icon **W** lit; if automatic, the maximum cycle duration timeout - expressed in minutes - is shown.

The time value, expressed in minutes, depends on the current setting for the target value and parameter t1 applies for freezing, parameter t2 for deep-freezing.

2. Press UP and/or DOWN within 3 sec if you want to change the timeout period.

The time set for **EWBC800** becomes the last temperature displayed (even if at a second moment an automatic target type will be set), then the display reverts to showing the room temperature.



Fig. 15. Selecting a blast chilling cycle target type

To restore the blast chilling cycle target type to its default value (t1 or t2 parameter), press **TARGET** three times in succession.

3.3.4.3. Selecting the blast chilling mode

To select the blast chilling mode (refer to **Fig. 16 on page 69**, if the blast chilling cycle mode is initially soft), press **MODE** until you have selected one of the blast chilling modes: Hard or Soft.



Pressing the **MODE** key repeatedly (at consecutive intervals of less than 3 sec) changes the displayed data (**D** - Fig. 9 on page 60) alternately, from the string 'Hrd' (Hard blast chill mode) to 'SFt' (Soft blast chill mode); the LED corresponding to the **MODE** key comes on simultaneously.

The mode set for **EWBC800** becomes the one corresponding to the last string displayed, then the display reverts to showing the room temperature.



Fig. 16. Selecting the blast chilling mode

3.3.4.4. Starting and stopping a program

To start a program, press **START/STOP**: **EWBC800** emits a short beep (buzzer) and the LED **D**RUNNING comes on.

If the program is automatic, the display (D - Fig. 9 on page 60) shows the temperature detected by the needle probe.

If the program is manual, the display shows the time remaining until the end of the cycle (in min) and the icon is lit. The value displayed initially is parameter t1 or parameter t2. For details of other displayed information, please refer to '3.3.5. Cyclical display' on page 71.



During a blast chilling cycle, press **TEMP** to view the current target value.

The blast chilling cycle ends automatically if one of the following conditions arises:

- the selected time has elapsed, if the target type is manual;
- the selected needle probe (core) target has been reached, if the target type is automatic.



In an automatic blast chilling cycle, if the set timeout period is reached (parameter t1 for the positive blast chilling cycle or t2 for the negative blast chilling cycle) without the selected temperature target being achieved, the blast chilling cycle continues indefinitely and the LED TIMEOUT Will blink.

Once the blast chilling cycle has finished, **EWBC800** emits a beep lasting 2 sec (buzzer) and automatically starts the storage phase.



To silence the buzzer in advance, press the **DOWN** key.

The storage phase starts automatically after a blast chilling cycle, but can also be started manually from the stop status (refer to **'3.3.7.3. Manual storage' on page 75**).

The automatic storage phase occurs:

• after a positive blast chilling cycle, at a cold room temperature equal to the value set for the SCP parameter;

• after a negative blast chilling cycle, at a cold room temperature equal to the value set for the SCn parameter.

During the storage phase, the display shows the room temperature (if the previous blast chilling cycle has a manual type target) or the temperature detected by the needle probe (if the previous blast chilling cycle has an automatic type target), with the LED **PRUNNING** on. For details of other displayed information, please refer to **'3.3.5. Cyclical display' on page 71**.

During the storage phase, the LEDs corresponding to the **TEMP**, **TARGET**, **MODE** keys come on in sequence, in line with the selected program (refer to Fig. 17 on page 70).



Fig. 17. Sequential LED display during the storage phase



During a storage phase, press TEMP to view the room probe temperature set point in storage mode, parameter SCP or parameter SCn, without affecting the LEDs.

To stop a program prematurely, press **START/STOP** to restore the program to its default settings (dFP parameter).



In stop status, the three LEDs for the **TEMP**, **TARGET**, **MODE** keys are lit corresponding to the default settings (dFP parameter) and the display shows the room temperature.

Pressing **START/STOP** again will restart the blast chilling cycle with the default settings applied (dFP parameter).

3.3.5. Cyclical display

Beginning with the current information on the display (**D** - **Fig. 9 on page 60**) when a blast chilling program in progress, press **UP** and/or **DOWN** to cyclically view the temperatures and times for that program. Every time the **UP** key is pressed, the following information is displayed cyclically:

- needle probe temperature,
- time elapsed,
- time remaining,
- cold room temperature.

 \mathbb{T} In stop status, the room temperature is the information displayed by default.

The cyclical display corresponding to repeated pressing of the **UP** key is conventionally illustrated in a clockwise direction in **Fig. 18 on page 71**.



The cyclical display corresponding to repeated pressing of the **DOWN** key conventionally moves in an anticlockwise direction, with reference to **Fig. 18 on page 27**.

The last information selected using the keys (T - Fig. 9 on page 60) remains on the display until the end of the program.

While the program is in progress, in case of one or more malfunctions, the display shows the last value selected via the keypad (**T - Fig. 9 on page 60**) along with the malfunction(s) present in succession.



Fig. 18. Cyclical display during a program

In the cyclical display, the first information suggested at the beginning of the program will be:

• the needle probe temperature, if the program in progress is automatic,



• the remaining time, if the program in progress is manual.

During the storage phase, the elapsed time and remaining time are not shown; if the needle probe temperature is disabled (parameter EPI=0), the string '—' is displayed.

3.3.6. Selecting and starting a special function

EWBC800 has special functions for the management of the following blast chiller functions:

- cold room sterilization,
- needle probe heating.

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A special function can be activated if one of the parameters FR1, FR2, FR3, FR4, FR5 is equal to 4 (cold room sterilization) or 3 (needle probe heating).

From the stop status, every single press of the **AUX** key selects an alternate special function, while simultaneously deselecting any program or optional function selected previously. Pressing and holding the **AUX** key deselects all special and optional functions, restoring the program selected previously.

3.3.6.1. Cold room sterilization



To activate a sterilization cycle the blast chiller door must be closed. If the blast chiller door is opened during the sterilization cycle, the cycle stops and the display (**D** - Fig. 9 on page 60) will show the string 'dOr'.

To select the sterilization cycle, press AUX until the special sterilization function has been selected.



Repeated pressing of the **AUX** key changes the information shown on the display alternately, from the string 'StE' (sterilization) to 'Prb' (needle probe heating); the LED corresponding to the **AUX** key comes on simultaneously.

If one of the two special functions cannot be activated, there is a single selection and the alternate display does not occur. If neither of the two special functions can be activated, pressing the **AUX** key does not have any effect on function selection.

To start the sterilization cycle, press **START/STOP**: the LED **PRUNNING** comes on and the string 'StE' remains on the display.

The start and duration of the sterilization cycle are determined by parameters iSt, UUd, UUt.



In the case of cold room probe error (refer to '5. Alarms' on page 86

- before the sterilization cycle begins, the sterilization cycle does not start and the string 'E2' blinks on the display;

- during the sterilization cycle, the sterilization cycle continues normally.

Once the sterlilization cycle has finished, **EWBC800** emits a beep lasting 2 sec (buzzer) and reverts to stop status.

To silence the buzzer in advance, press the **DOWN** key.

To stop the sterilization cycle prematurely, press the **START/STOP** key.

Pressing **START/STOP** again starts the blast chilling cycle with the default settings applied (dFP parameter).

Parameter	Description
iSt	Regulation hysteresis
UUd	Sterilization cycle duration
UUt	Sterilization temperature threshold

3.3.6.2. Needle probe heating

The door opening or closing has no effect on the needle probe heating.

To select needle probe heating, press AUX until the special needle probe heating function has been selected.



Repeated pressing of the AUX key changes the information shown on the display (**D** - Fig. 9 on page 60) alternately, from the string 'StE' (sterilization) to 'Prb' (needle probe heating); the LED corresponding to the AUX key comes on simultaneously. If one of the two special functions cannot be activated, there is a single selection and the alternate display does not occur. If neither of the two special functions can be activated, pressing the AUX key does not have any effect on function selection.

To start needle probe heating, press **START/STOP**: the LED **PRUNNING** comes on and the string 'Prb' remains on the display.



The start and duration of needle probe heating are determined by parameters Prd, Prt.

In the event of a needle probe error (refer to '5. Alarms' on page 42), needle probe heating continues as normal; the display shows the blinking strings 'E1' and 'Prb' alternately.

Once needle probe heating has finished, EWBC800 emits a beep lasting 2 sec (buzzer) and reverts to stop status.



To silence the buzzer in advance, press the **DOWN** key.

To stop needle probe heating prematurely, press the START/STOP key.

Pressing START/STOP again starts the blast chilling cycle with the default settings applied (dFP parameter).

Parameter	Description
Prd	Maximum needle heating duration
Prt	Needle probe heating temperature set point

3.3.7. Selecting and starting an optional function

EWBC800 has **special functions** for the management of the following blast chiller functions:

- room light,
- defrost,
- manual storage.

An optional function can be activated if one of the parameters FR1, FR2, FR3, FR4, FR5 is equal to 5 (room light), 6 (defrost) or 8 (manual storage).

From the stop status, every single press of the **ESC** key selects an optional function, while simultaneously deselecting any main program or special function selected previously. Pressing and holding the **ESC** key deselects all special and optional functions, restoring the program selected previously.



The room light and defrost functions can be started while a program is already in progress (LED **D**RUNNING on).

3.3.7.1. Room light (if enabled via parameter)

The room light can be controlled by one of the outputs, depending on which of the parameters FR1, FR2, FR3, FR4, FR5 is set to 5, in line with the following correspondence:

FRI> OUTI	
FR2> OUT2	
FR3> OUT3	
FR4> OUT4	
FR5> OUT5	

To select the room light, press ESC until the optional room light function has been selected.

Pressing the **ESC** key changes the displayed data (**D** - **Fig. 9** on page 60) alternately, between the strings 'dEF' (defrost), 'Con' (storage) and 'LMP' (room light); the LED corresponding to the **ESC** key comes on simultaneously.

If one of the three optional functions cannot be activated, you can select from the remaining options, i.e. only the functions to which the physical resource is associated.

If two of the three optional functions cannot be activated, there is a single selection and the alternate display does not occur. If none of the three special functions can be activated, pressing the **ESC** key does not have any effect on function selection; the corresponding LED blinks for 3 sec.

To start the room light for an indefinite period of time, press **START/STOP**: the string 'LMP' remains on the display.

 ${
m free}$ If the power supply is cut off, the room light will be switched off when power is restored.

If the room light is on, it will be possible to select and view any other program. In this case, to switch off the room light, proceed as follows:

I. press ESC repeatedly until the string 'LMP' appears,

2. press START/STOP.

3.3.7.2. Defrost

The defrost is normally carried out by the User with the blast chiller door open (cold room heating). The door opening or closing has no effect on the defrost execution.

There are two types of defrost:

- manual (parameter dF2=0), activated via keypad (T Fig. 9 on page 60),
- automatic (parameter dF2 not 0), activated automatically at pre-set time intervals, determined by the value of parameter dF2 (interval between defrosts): this parameter represents the timeout after which **EWBC800** automatically begins a new defrost.

To select manual defrosting, press **ESC** until the optional defrost function has been selected.



If one of the three optional functions cannot be activated, you can select from the remaining options, i.e. only the functions to which the physical resource is associated.

If two of the three optional functions cannot be activated, there is a single selection and the alternate display does not occur. If none of the three special functions can be activated, pressing the **ESC** key does not have any effect on function selection; the corresponding LED blinks for 3 sec.

To start manual defrosting, press **START/STOP**: the string 'dEF' remains on the display and the icon 🔀 begins to blink, to indicate the pending request.

The defrost begins:

- immediately if a storage phase is in progress,
- at the same time as the next storage phase.
- or as soon as a new blast chilling cycle begins (according to parameter dF5)

During the defrost, the string 'dEF appears on the display and the icon \aleph remains lit steadily.

Once the defrost has finished due to timeout (parameter dF4) or due to reaching the target temperature (parameter dF1), **EWBC800** emits a beep lasting 2 sec (buzzer) and reverts to stop status.



To silence the buzzer in advance, press the **DOWN** key.

To end the defrost (and the storage phase in progress) prematurely, press **START/STOP**. Pressing **START/STOP** again starts the blast chilling cycle with the default settings applied (dFP parameter).



Parameter	Description			
dFI	Enable/Maximum defrost duration (0= defrost disabled)			
dF2	Interval between defrosts (0= automatic disabled, manual only)			
dF3	Defrost type (0 = electric, 1 = hot gas, 2 = air)			
dF4	Temperature threshold above which the defrost is considered concluded or, during checking, unnecessary			
dF5	Defrost active even at the start of a blast chill program (0 = no)			

3.3.7.3. Manual storage

To select manual storage, press **ESC** until the optional manual storage function has been selected: the LED corresponding to the **TEMP** key for positive storage begins to blink.



Pressing the **ESC** key changes the displayed data (**D** - **Fig. 9 on page 60**) alternately, between the strings 'dEF' (defrost), 'Con' (storage) and 'LMP' (room light) if set via parameter; the LED corresponding to the **ESC** key comes on simultaneously. If one of the three optional functions cannot be activated, you can select from the remaining options, i.e. only the functions to which the physical resource is associated.

If two of the three optional functions cannot be activated, there is a single selection and the alternate display does not occur. If none of the three special functions can be activated, pressing the **ESC** key does not have any effect on function selection; the corresponding LED blinks for 3 sec.

To select manual storage, press the **TEMP** key repeatedly:

- the LED for the **TEMP** key corresponding to 👯 comes on, select 'positive storage',
- the LED for the **TEMP** key corresponding to zero, select 'negative storage'.

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The LEDs corresponding to the **TARGET** and **MODE** keys are switched off.

To start manual storage, press **START/STOP**: the display shows the room temperature and the LED **URUNNING** comes on.



During a storage phase, press the **TEMP** key to view the cold room storage temperature set point, SCP parameter or SCn parameter, without affecting the corresponding LEDs in any way. Pressing the **UP** and/or **DOWN** keys repeatedly results in a cyclical display (**Fig. 18 on page 71**): manual storage is considered started following a manual blast chilling cycle (timed).

During the storage phase, the LEDs corresponding to the **TEMP**, **TARGET**, **MODE** keys come on cyclically, in line with the selected program (refer to Fig. 17 on page 70).

To stop manual storage prematurely, press the **START/STOP** key.

Pressing **START/STOP** again starts the blast chilling cycle with the default settings applied (dFP parameter).

3.3.8. Blast chiller door presence

If the closing control microswitch is present on the blast chiller door (parameter Edo = 1), digital input DII is managed as an input corresponding to the microswitch. In this case:

- if parameter SLd=0, door closing determines consent for the compressor to start;
- if parameter SLd=1 (default), the compressor is active even with the door open, while the cold room fan always stops when the door is open.



To silence the buzzer in advance, press the **DOWN** key.

The program or function is not interrupted.

3.3.9. Parameters configuration

EWBC800 has two types of parameter:

- visible parameters, aimed at the User,
- advanced parameters, aimed at the Installer.

To access the advanced parameters, enter a password (parameter PS2) (refer to **'3.3.9.2. Entering a password for advanced parameters' on page 77**).

To change a parameter, please refer to '3.3.9.1. Configuring a parameter' on page 76.



To configure the parameters, **EWBC800** must be in stop status.

To display the list of parameters, press and hold both the **UP** and **DOWN** keys simultaneously for at least 2 seconds: the display (**D** - Fig. 9 on page 60) shows parameter t1.

3.3.9.1. Configuring a parameter

To change the value of a parameter (Fig. 19 on page 76), proceed as described below:

- I. press the **UP** or **DOWN** key until the display shows the name of the parameter to be changed;
- 2. press AUX to view the value of the parameter;

Press **ESC** to return to the previous display (list of parameters) without making any changes.

- 3. press the UP or DOWN key within 10 seconds to respectively increase or decrease the value of the parameter;
- 4. to confirm the change in parameter value:
 - press SET, or ESC
 - wait for 10 sec.

To exit the list of parameters view:

- press ESC once, or
- wait for 10 sec.





3.3.9.2. Entering a password for advanced parameters

To enter the password, proceed as follows:

- 1. press the **UP** or **DOWN** key until the display shows the parameter 'PA2';
- 2. press the SET key;
- 3. the value '0' will appear on the display;

Press ESC to return to the previous display (list of parameters) without entering any password.

4. press the UP or DOWN key within 10 seconds to respectively increase or decrease the value of parameter 'PA2';



(Press ESC to cancel the changes and return to the previous display (list of parameters).

5. to confirm the correct value has been entered for parameter 'PA2' and access the list of advanced parameters, press SET or wait for 10 sec.



To configure a parameter on the list of advanced parameters, please refer to '3.3.9.1. Configuring a parameter' on page 76.

For the advanced parameters description refer to '3.4. Table of visible and advanced parameters' on page 78.



If a password set to a value other than the default is lost, contact Eliwell to recover it.

Once the password for advanced parameters has been entered, the value for that password can also be changed

TABLE OF PARAMETERS

3.4. TABLE OF VISIBLE AND ADVANCED PARAMETERS



The access to advanced parameters is password-protected and restricted to qualified personnel only.

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Advanced parameters are highlighted in orange.

For the advanced parameters access mode refer to '3.3.9.2. Entering a password for advanced parameters' on page 77.

Par.	Description	Default	Range	U. M.
iSt	Regulation hysteresis	3	1.020.0	°C/°F
tl	Positive timed blast chilling duration (timeout for automatic program)		0599	Min
t2	Negative timed blast chilling (deep-freezing) duration (timeout for automatic program)		0599	Min
tP	Needle target for positive blast chilling	3	SPS99.0	°C/°F
tn	Needle target for negative blast chilling	-18.0	Snh99.0	°C/°F
SPS	Room set point for Soft positive blast chilling (single phase)	0	-50.0tP	°C/°F
Snh	Room set point for Hard negative blast chilling (single phase)	-45.0	-50.0tn	°C/°F
tF	Needle target for Phase I of automatic Hard positive blast chilling	10.0	-50.099.0	°C/°F
SPF	Room set point for Phase I of Hard positive blast chilling	-20.0	-50.099.0	°C/°F
SCP	Room set point for positive storage	1.0	-50.099.0	°C/°F
SCn	Room set point for negative storage	-25.0	-50.099.0	°C/°F
dOF	Compressor Protection Off/On (also valid at reset)	2	099	Min
dOn	Compressor Protection On/On	3	099	Min
dFl	Enable/Maximum defrost duration (0= defrost disabled)	10	099	Min
dF2	Interval between defrosts (0= automatic disabled, manual only)	0	099	hours
dF3	Defrost type EL (0) = electric, gAS (1) = hot gas,Air (2) = air	2	02	num
dF4	Temperature threshold above which the defrost is considered concluded or, during checking, unnecessary.	8.0	-50.099.0	°C/°F
dF5	Defrost active even at the start of a blast chill program no (0) = defrost NOT active, yES (1) = defrost active	0	01	num
dF6	Dripping duration	3	099	Min
drl	Enable door heating no (0) = disabled, yES (1) = enabled	I	0I	num
dr2	Door heating activation threshold	5.0	-50.099.0	°C/°F
Fan	Fan in blast chill status (0=parallel to compressor, I=always ON)	I	0I	num
FRI	Configurability of digital output R I OFF (0) = disabled, rdO (1) = door heater, C F (2) = condenser fan, H P (3) = needle probe heating, U u (4) = UV lamp, Lig (5) = room light, dEF (6) = defrost, E F (7) = evaporator fan, CMP (8) = compressor	8	08	num
FR2	Configurability of digital output R2. Same as FR I	7	08	num
FR3	Configurability of digital output R3. Same as FR1	2	08	num
FR4	Configurability of digital output R4. Same as FR I	I	08	num
FR5	Configurability of digital output R5. Same as FR1	0	08	num
tP0	Probe type Pb2, Pb3, Pb4. ntC (0) = NTC, PtC (1) = PTC	0	0I	num
dEC	Decimal point $^{\circ}$ C. no (0) = display without decimal point, yES (1) = with decimal point	I	01	num
UCF	°C/°F selection. C (0) = °C, F (1) = °F	0	01	num
EPI	Enable core probe. no (0) = disabled, yES (1) = enabled	I	01	num
EP3	Enable evaporator probe. no (0) = disabled, yES (1) = enabled	0	01	num
Edo	Door present. 0 = absent; 1 = present	I	01	num
tdO	Timer for door alarm signal	0	0999	sec

Par.	Description		Range	U. M.
EnC	Enable negative blast chilling. 0= disabled; I = enabled		0I	num
SLd	Stop loads when door open. 0 = Compressor + Fan, I = Fan	I	0I	num
dFP	Program default setting. PMH (0) = Positive Manual HARD, PMS (1) = Positive Manual SOFT, PAH (2)= Positive Automatic HARD, PAS (3) = Positive Automatic SOFT, nMH (4)= Negative Manual HARD, nMS (5) = Negative Manual SOFT, nAH (6)= Negative Automatic HARD, nAS (7)= Negative Automatic SOFT, HLd (8) = Previous case	5	08	num
Uud	Sterilization cycle duration	15	l999	sec
Uut	Sterilization temperature threshold	5.0	-50.099.0	°C/°F
Prd	Maximum needle heating duration	0	010	Min
Prt	Needle probe heating temperature set point	4.0	090.0	°C/°F
SCF	Condenser temperature set point, for secondary fan	80.0	-50.099.0	°C/°F
EPS	Pressure switch setting. 0 = disabled.	0	04	num
PPS	Pressure switch polarity. nO (0) = normally open, nC (1) = normally closed	I	0I	num
OFL	Offset subtracted from set point in storage to determine the low temperature alarm threshold	10.0	099.0	°C/°F
LAE	Enable room minimum temperature alarm (no (0) = disabled, yES (1) = enabled)	I	0I	num
OFH	Offset added to set point in storage to determine the high temperature alarm threshold	10.0	0I	°C/°F
HAE	Enable room maximum temperature alarm. no (0) = disabled, yES (1) = enabled	I	0I	num
PS2	Password to access the advanced parameters Restricted to qualified personnel. Refer to the user manual available on Eliwell website in the restricted area or contact the technical support.	15	0999	num
tAB	Reserved	I	065535	num

4. LOADS OPERATION LOGICS

The operating logics for the loads are illustrated below; each one can be controlled by any digital relay output, according to the following correspondence between parameters FR1, FR2, FR3, FR4, FR5 and the outputs:

FRI> OUTI
FR2> OUT2
FR3> OUT3
FR4> OUT4
FR5> OUT5



 $\stackrel{?}{=}$ OUT5 is an open collector output, and therefore requires connection of an external relay.

4.1. COMPRESSOR

The compressor can be controlled by one of the outputs, depending on which of the parameters FR1, FR2, FR3, FR4, FR5 is set to 8. Fig. 20 on page 80 illustrates the operating logic of relay R1 (refer to the pre-set types described in '2.2. INPUT / OUTPUT / PORT CHARACTERISTICS' on page 53), specifying when it activates and deactivates the compressor, according to the room temperature set point and regulation hysteresis.

If the blast chiller is fitted with a microswitch for door control closing (parameter EdO=1), the compressor can be activated:

- only with closed door, if the parameter SLd=0,
- also with door open, if the parameter SLd=1.

4.1.1. Compressor protections

To protect the compressor, the following timeframes have been provided:

- minimum time that must elapse between the compressor switching off and the subsequent switching on (parameter dOF);
- minimum time that must elapse between two consecutive start ups of the compressor (parameter dOn).

If a timeout is already in progress, both times, if greater than the counting, will be reset.



The minimum time that must elapse between the compressor switching off and the subsequent switching on is counted even after the **EWBC800** power supply is interrupted.



Fig. 20. Compressor operation

With reference to Fig. 20 on page 80, the following tables shows the operating logics of the compressor, specifying when it is switched on and off depending on the target value and blast chill mode selected.



Compressor operation depends on the blast chilling cycle target value and the blast chill mode, but it does not depend on the blast chilling cycle target type.

In the operating logics described in the following paragraphs, the storage phase starts automatically after a blast chilling cycle; alternatively, the storage phase can be started manually (refer to **'3.3.7.3. Manual storage' on page 75**).

4.1.2. Positive target value with soft blast chill mode

The compressor is activated or deactivated according to the operating logic indicated in the table below.

Positive program	temperature set point	hysteresis	Activated compressor if	Deactivated compressor if
blast chilling cycle	SPS	:54	room temperature (PB2)	room temperature (PB2)
storage phase	SCP	131	+ hysteresis	set point

4.1.3. Positive target value with hard blast chill mode

This program consists of two consecutive stages, with timeouts calculated automatically by **EWBC800** according to the value of parameter t1 (default: 90 min):

- stage I, with timeout duration equal to 2/3 of tI (default: 60 min),
- stage 2, with timeout duration equal to 1/3 of t1 (default: 30 min).

<u>STAGE I</u>

During stage I, the compressor is activated or deactivated according to the operating logic indicated in the table below.

Positive program	temperature set point	hysteresis	Activated compressor if	Deactivated compressor if
hard blast chilling cycle - stage 1	SPF	iSt	room temperature (PB2) higher or equal to set point + hysteresis	room temperature (PB2) less than or equal to set point

Stage I ends automatically if one of the following conditions arises:

- timeout for stage I reached (2/3 of tI), if target type is manual;
- needle probe (core) target for stage I reached (parameter tF), if target type is automatic;
- temperature target for stage 1 not reached, but timeout for stage 1 reached (2/3 of t1), if target type is automatic.

If stage 1 has ended due to the timeout for stage 1 being reached, the LED **TIMEOUT** will not blink during the subsequent stage 2.

EWBC800 automatically moves on from stage 1 to stage 2.

<u>STAGE 2</u>

During stage 2, the compressor is activated or deactivated according to the operating logic indicated in the table below.

Positive program	temperature set point	hysteresis	Activated compressor if	Deactivated compressor if
hard blast chilling cycle - stage 2	SPS	iSt	room temperature (PB2)	room temperature (PB2)
storage phase - stage 2	SCP		+ hysteresis	set point

The blast chilling cycle for stage 2 ends automatically if one of the following conditions arises:

- timeout for stage 2 reached (1/3 of t1), if target type is manual;
- selected needle probe (core) target reached (parameter tP), if target type is automatic;

• selected temperature target not reached, but timeout for stage 2 reached (1/3 of t1), if target type is automatic.

If the blast chilling cycle (automatic) for stage 2 has ended due to the timeout for stage 2 being reached, the LED **TIMEOUT** will blink during the subsequent storage phase.



Any information on the display (**D** - Fig. 9 on page 60) regarding the time elapsed since the start of the program or time remaining until the end of the program depends on the overall duration of the program (parameter t1) and not on the duration of stage 1 or the duration of stage 2. For example, the time remaining that can be seen on the display during stage 1 is the sum of the time required to complete stage 1 and the timeout for stage 2 (1/3 of t1).

4.1.4. Negative target value with hard blast chill mode

The compressor is activated or deactivated according to the operating logic indicated in the table below.

Negative program	temperature set point	hysteresis	Activated compressor if	Deactivated compressor if
blast chilling cycle	Snh		room temperature (PB2)	room temperature (PB2)
storage phase	SCn	iSt	higher or equal to set point + hysteresis	less than or equal to set point

4.1.5. Negative target value with soft blast chill mode

This program consists of two consecutive stages, with timeouts calculated automatically by **EWBC800** according to the value of parameter t2 (default: 240 min):

- stage I, with timeout duration equal to 1/2 of t2 (default: 120 min),
- stage 2, with timeout duration equal to 1/2 of t2 (default: 120 min).

<u>STAGE I</u>

During stage I, the compressor is activated or deactivated according to the operating logic indicated in the table below.

Positive program	temperature set point	hysteresis	Activated compressor if	Deactivated compressor if
soft blast chilling cycle - stage l	SPS	iSt	room temperature (PB2) higher or equal to set point + hysteresis	room temperature (PB2) less than or equal to set point

Stage I ends automatically if one of the following conditions arises:

- timeout for stage I reached (1/2 of t2), if target type is manual;
- fixed needle probe target for stage I reached (value at +3°C), if target type is automatic;
- temperature target for stage 1 not reached, but timeout for stage 1 reached (1/2 of t2), if target type is automatic.



EWBC800 automatically moves on from stage 1 to stage 2.

STAGE 2

During stage 2, the compressor is activated or deactivated according to the operating logic indicated in the table below.

Negative program	temperature set point	hysteresis	Activated compressor if	Deactivated compressor if
blast chilling cycle - stage 2	Snh	:64	room temperature (PB2)	room temperature (PB2)
storage phase - stage 2	SCn	ISL	+ hysteresis	set point

The blast chilling cycle for stage 2 ends automatically if one of the following conditions arises:

- timeout for stage 2 reached (1/2 of t2), if target type is manual;
- selected needle probe (core) target reached (parameter tn), if target type is automatic;
- selected temperature target not reached, but timeout for stage 2 reached (1/2 of t2), if target type is automatic.

If the blast chilling cycle (automatic) for stage 2 has ended due to the timeout for stage 2 being reached, the LED TIMEOUT C will blink during the subsequent storage phase.



Any information on the display (**D** - **Fig. 9 on page 60**) regarding the time elapsed since the start of the program or time remaining until the end of the program depends on the overall duration of the program (parameter t2) and not on the duration of stage 1 or the duration of stage 2. For example, the time remaining that can be seen on the display during stage 1 is the sum of the time required to complete stage 1 and the timeout for stage 2 (1/2 of t2).

4.2. EVAPORATOR ROOM FAN

The evaporator room fan can be controlled by one of the outputs, depending on which of the parameters FR1, FR2, FR3, FR4, FR5 is set to 7.

The cold room fan, if provided, is activated during the execution of a program, according to the value of parameter FAn:

- if the parameter FAn=1, the room fan is always on, both during the blast chilling cycle and during the storage phase;
- if the parameter FAn=0, the room fan is activated together with the compressor, following the operating logic of the compressor described in '4.1. Compressor' on page 80.

4.3. DEFROST



During the defrost, any open door alarms 'dOr' are ignored (refer to '5. Alarms' on page 86

The defrost heater can be controlled by one of the outputs, depending on which of the parameters FR1, FR2, FR3, FR4, FR5 is set to 6. There are 3 types of defrost, each of which produces a specific behaviour in relays R1, R2, R3 (refer to the pre-set types described in **'2.2. INPUT / OUTPUT / PORT CHARACTERISTICS' on page 53**) on the basis of the value of parameter dF3, according to the operating logic indicated in the table below.

Parameter dF3	Type of defrost	RI (Compressor)	R2 (Cold room fan)	R3 (Defrost heater)
0	Electric	Inactive	Inactive	Active
1	Hot gas	Active	Inactive	Active
2	Air	Inactive	Active	Active

The defrost is enabled or disabled according to the value of the parameter dFI:

- if the parameter dF1=0, the defrost is disabled,
- if parameter dF1 is not 0, the defrost is enabled and has a maximum duration, in min, equal to the value of parameter dF1.

The defrost can be manually or automatically activated according to the value of the parameter dF2:

- if the parameter dF2=0, the defrost can be activated manually,
- if parameter dF2 is not 0, the defrost can be activate automatically at intervals between two consecutive defrosts, in hours, with a duration equal to dF2.

The evaporator probe PB3 can be enabled or disabled according to the value of the parameter EP3:

• if parameter EP3=0, evaporator probe PB3 is disabled: the defrost can only be activated automatically,

• if parameter EP3=1, evaporator probe PB3 is enabled: the defrost can be activated both automatically and manually (parameter dF2). The defrost is activated or deactivated according to the operating logic indicated in the table below.

Activated defrost if	Deactivated defrost if
evaporator temperature (PB3) <= evaporator temperature	evaporator temperature (PB3) => evaporator temperature
threshold (parameter dF4)	threshold (parameter dF4)

If the defrost is activated, the icon \Re blinks; if the defrost is activated and the blast chiller is in its storage phase, the defrost will become operative and the icon \Re is lit steadily.

If parameter dF5=1 the defrost is also carried out at the beginning of - but never during - a blast chilling cycle.



If the defrost request is generated during a blast chilling cycle, the defrost will take place at the end of the blast chilling cycle, at the same time as the subsequent storage phase starts up.

If the defrost request is generated in stop status, the next time a program is started the defrost is carried out beforehand.

At the end of the defrost cycle, the compressor can be activated only when the greatest of the following times has elapsed:

- dripping time (parameter dF6),
- minimum time that must elapse between the compressor switching off and the subsequent switching on (parameter dOF).

4.4. DOOR HEATING

Door heating can only be activated through parameter configuration (refer to **'3.3.9. Parameters configuration' on** page 76).

Door heating is enabled or disabled according to the value of the parameter dRI:

• if parameter dRI=0, door heating is disabled, if parameter dRI=1, door heating is enabled.

Door heating can be activated if one of the parameters FR1, FR2, FR3, FR4, FR5 is set to 1.

Door heating can be controlled by one of the outputs, depending on which of the parameters FR1, FR2, FR3, FR4, FR5 is set to 1.

Door heating, if enabled, is always active and not dependent on the operating logic of other loads or on other programs in progress.

Door heating is activated or deactivated according to the operating logic indicated in the table below.

Door heating activated if	Door heating deactivated if
cold room temperature (PB2) <= door heating temperature	cold room temperature (PB2) => door heating temperature
threshold (parameter dR2) - hysteresis (parameter iSt)	threshold (parameter dR2)

4.5. CONDENSER FAN

The condenser fan can be controlled by one of the outputs, depending on which of the parameters FR1, FR2, FR3, FR4, FR5 is set to 2.

EWBC800 automatically deactivates the condenser probe PB4 if the condenser fan is not controlled by any output, i.e. if none of the parameters FR1, FR2, FR3, FR4, FR5 is set to 2.

The condenser fan is activated or deactivated according to the operating logic indicated in the table below.

The condenser fan is activated	The condenser fan is permanently activated	
along with the compressor if	and the compressor deactivated if	
condenser probe temperature (PB4) <= condenser temperatu-	condenser probe temperature (PB4) => condenser temperature	
re threshold (parameter SCF)	threshold (parameter SCF)	

The condenser fan is activated at the same time as the compressor during a program (blast chilling cycle or storage phase).

If the compressor is deactivated, the display (**D** - Fig. 9 on page 60) shows the blinking PB4 condenser probe temperature along with the alarm icon.



In this alarm condition, press **START/STOP** to stop the program in progress and remove the alarm condition.

Any program in progress will be paused, to resume when the condenser threshold temperature (PB4) drops back under the condenser temperature threshold (parameter SCF).



If the condenser probe temperature (PB4) exceeds the condenser temperature threshold (parameter SCF) during stop status, the operating logic described in the table above is not applied; this check is carried out the next time the program is started.

4.6. UV LAMP - STERILIZATION

Opening the door stops sterilization and generates the door open alarm 'dOr' (refer to **'5.Alarms' on page 86** The UV lamp for sterilization can be controlled by one of the outputs, depending on which of the parameters FR1, FR2, FR3, FR4, FR5 is set to 4.

During sterilization the UV lamp and the evaporator fan are activated for a time, in seconds, equal to the value of parameter UUd. Sterilization is activated or deactivated according to the operating logic indicated in the table below.

The sterilization is activated if	The sterilization is deactivated if
cold room temperature (PB2) => sterilization temperature	cold room temperature (PB2) <= sterilization temperature
threshold (parameter UUt).	threshold (parameter UUt) - hysteresis (parameter iSt)

4.7. NEEDLE PROBE HEATING

The needle probe heater can be controlled by one of the outputs, depending on which of the parameters FR1, FR2, FR3, FR4, FR5 is set to 3.

The needle probe heater is activated for a time, in minutes, equal to the maximum needle probe heating time (parameter Prd).

lf

needle probe temperature (PBI) => needle probe heating temperature set point (parameter Prt)

the needle probe heater is deactivated before the maximum needle probe heating time has elapsed (parameter Prd).

5. ALARMS

The EWBC800 is able to perform a complete diagnostics of the blast chiller, reporting any malfunctions with specific alarms, showing the corresponding code on the display (DI - Fig. 5 on page 56).



No beep sounds when an alarm occurs.

The following table lists the alarms, with related code, indicating the causes, effects and solutions.

Alarm	Cause	Effects	Solutions
Needle probe error	 Needle probe present (parameter EP1=1) Needle probe not connected properly 	If an automatic program is in progress, switch to manual program	Check the connection of the needle probe to the EWBC800
	 Needle probe present (parameter EP1=1) Faulty needle probe 		Replace the needle probe
Cold room probe error	Cold room probe not connected properly	If a manual program is in progress with the needle probe present (parameter EPI=I), the manual program continues	Check the connection of the cold room probe to the EWBC800
	Cold room probe failure	probe If a manual program is in progress with the needle probe absent (parameter EPI=0), the manual program stops (stop status) If an automatic program is in progress, the automatic program stops (stop status)	Replace the cold room probe
Evaporator probe error (defrost)	 Evaporator probe present (parameter EP3=1) Evaporator probe not connected properly 	If a defrost is in progress, it continues without checking the evaporator probe temperature	Check the connection of the evaporator to the EWBC800
			Replace the evaporator probe
Condenser probe error	- Condenser probe not connected properly	1	Check the connection of the auxiliary probe to the EWBC800
	Condenser probe failure		Replace the auxiliary probe
Low temperature alarm	If a storage phase is in progress with: - parameter LAE=1 - error E2 absent, - room probe temperature (PB2) <= room storage temperature set point (parameter ScP or Scn) - low temperature alarm		1
	Alarm Needle probe error Cold room probe error Evaporator probe error (defrost) Condenser probe error Condenser probe error Low temperature alarm	AlarmCauseNeedle probe error- Needle probe present (parameter EP1=1) - Needle probe not connected properly- Needle probe present (parameter EP1=1) - Faulty needle probeCold room probe errorCold room probe not connected properlyEvaporator probe error (defrost)- Evaporator probe present (parameter EP3=1) - Evaporator probe not connected properlyEvaporator probe error (defrost)- Evaporator probe not connected properly Faulty evaporator probe not connected properlyCondenser probe error (defrost)- Condenser probe not connected properly Faulty evaporator probe faulty evaporator probe fonnected properlyLow temperature alarmIf a storage phase is in progress with: - parameter LAE=1 - error E2 absent, - room probe temperature (PB2) <= room storage temperature alarm offset (parameter OFL)	Alarm Cause Effects Needle probe - Needle probe present (parameter EPI=1) - Needle probe not connected properly f an automatic program is in progress, witch to manual program - Needle probe present (parameter EPI=1) - Faulty needle probe if a manual program is in progress with the needle probe present (parameter EPI=1), the manual program continues using the needle probe as a cold room probe Cold room probe failure Cold room probe failure If a defrost is in progress with the needle probe absent (parameter EPI=0), the manual program stops (stop status) Evaporator probe error (defrost) - Evaporator probe present (parameter EP3=1) - Evaporator probe not connected properly If a defrost is in progress, it continues without checking the evaporator probe temperature Condenser probe error - Condenser probe not connected properly If a defrost is in progress, it continues without checking the evaporator probe temperature Low temperature alarm If a storage phase is in progress with: - parameter LAE=1 - error E2 absent, - room probe temperature alarm / Low temperature alarm If a storage phase is no progress with: - parameter LAE=1 - error E2 absent, - room probe temperature alarm /

Code	Alarm	Cause	Effects	Solutions
AH	High temperature alarm	If a storage phase is in progress with: - parameter HAE=1 - error E2 absent, - roomprobetemperature (PB2) => room storage temperature set point (parameter ScP or Scn) - high temperature alarm offset (parameter OFH)	/	1
dOr	Door open	 Door open (function of parameter tdO) Blast chiller door opening with program or optional function (except defrost) in progress 	The program or function is in progress Cold room fan deactivation Compressor deactivation (depending on parameters SLd and tdO)	Close the blast chiller door to reactivate the evaporator room fan (if parameter SLd=0) When the program or function is in progress, press START/STOP to stop the program or function, remove 'dOr' and revert to stop status
PrS	Pressure switch alarm without loads locking Pressure	 Opening of the pressure switch DI2 (if parameter EPS is anything other than 0) Pressure switch alarm events count < parameter EPS Opening of the pressure 	Increase by one unit of the alarm counter (initially zero) Blast chiller in stand-by status: - compressor deactivation - evaporator room fan deactivation - condenser fan activation - time counting stand-by, if a manual program is in progress Deactivation of all loads	Close the pressure switch DI2 and wait for the safety times of the compressor (parameter dOF and parameter dOn) Press START/STOP *
	switch alarm with loads locking	switch DI2 (if parameter EPS is anything other than 0) - Pressure switch alarm events count = parameter EPS		

*When the START/STOP key is pressed the program or the special function in progress stops and the alarm events count is reset.



When switched on, EWBC800 indicates the pressure switch alarm 'PrS' if the DI2 pressure switch is open, as this input is normally closed (NC). The pressure switch alarm has priority over the open door alarm.

The following table summarizes the different display views depending on the alarms that occur if the display shows the PB2 probe temperature.



(The PB2 probe temperature information displayed is equal to 40°C (main display).

Type of error	On-screen display
None (continuous display of the PB2 probe temperature)	
PB2 probe error (continuous display of 'E2'). If the PB1 probe temperature is displayed, cyclic display in succession of 'E2' and PB1 probe temperature	<u>53</u>
PB1, PB3 or PB4 probe error (e.g. PB3 probe error: cyclic display in succession of 'E3'-'40')	400 2 53
Error of two probes, one of which is PB2 (e.g. probe PB2 and PB3 error: cyclic display in succession of 'E3'- 'E2')	<i>E2</i> ≠ <i>E3</i>
Error of two probes, excluding PB2 (e.g. probe PB1 and PB3 error: cyclic display in succession of 'E3'-'40'- 'E1'-'40')	400 → 83 ↑ ↓ € 1 ← 400
Error of three probes, one of which is PB1 (e.g. probe PB1, PB2 and PB3 error: cyclic display in succession of 'E2'-'E3'-'E2'-'E1')	E2 → E3 † ↓ E1 ← E2
Error of three probes, excluding PB2 (probe PB1, PB3 and PB4 error: cyclic display in succession of 'E1'-'40'- 'E3'-'40'-'E4'-'40')	400 → E : → 400 ↑ ↓ E 4 ← 400 ← E 3
Low temperature alarm AL (cyclic display in succession of 'AL'-'40'). In the case of other errors (excluding E2), display in succession with each of them	<i>Ч</i> :::: Я:
High temperature alarm AH (cyclic display in succession of 'AH'-'40'). In the case of other errors (excluding E2), display in succession with each of them	<i>└;[][] </i> 컱 <i>月</i> ;;
Door open, with Edo=1 (fixed display of 'dOr.')	
Open pressure switch with EPS other than 0 and alarm events count under EPS (blinking display of 'PrS')	
Open pressure switch with EPS other than 0 and alarm events count equal to EPS (cyclical display of 'PrS' and LED o lit steadily)	<i>400</i> ₹ <i>2-5</i>

With the program in progress,

- In case of one or more malfunctions, the display shows the last value selected via the keypad (**T Fig. 9 on page 60**) along with the malfunction(s) present in succession (refer to '3.3.5. Cyclical display' on page 71);
- in case of a PBI probe error with displaying of the current PBI probe temperature, 'EI' appears steadily on the display and other values can be viewed cyclically (refer to '3.3.5. Cyclical display' on page 71);

• in case of a PB2 probe error with displaying of the current PB2 probe temperature, 'E2' appears steadily on the display and other values can be viewed cyclically (refer to '**3.3.5. Cyclical display' on page 71**).



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