

THERMOREGULATOR CLIP



Fermentation Temperature Control System Clip

Operating Instructions

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1. Introduction

Please read these user instructions fully and carefully. The user instructions are an integral part of the product you have purchased and provide detailed guidance on installation and operation. Always follow the safety instructions. If you have any questions or are unsure about application of the product, please contact your authorized dealer or the service center. Keep these instructions for future reference and, if necessary, pass them on to others to ensure they benefit from the advice contained within.

2. Intended Use

The fermentation temperature control system can be used to control the temperature during the fermentation of fruit juices. It can be installed as a fixed unit or, according to requirements, be applied as a temporary measure at various locations. It is intended for application in moisture-prone areas. It is strictly prohibited to immerse the fermentation temperature control system in water or allow it to be in contact with water permanently. It is rated to IP54 and thus resistant to water spray. The fermentation temperature control system should only be opened by the manufacturer. If safety instructions are not complied with, then this can lead to life-threatening injuries, hazards and malfunctioning (short circuit, fire, electric shock).

3. Safety Instructions

Important:

Please observe the following instructions to avoid injuries or damage resulting from misuse.

The warranty will be void if damage results from non-adherence to these user instructions.

In this case, the manufacturer shall also not be liable for any consequential damage. Errors and omissions excepted.

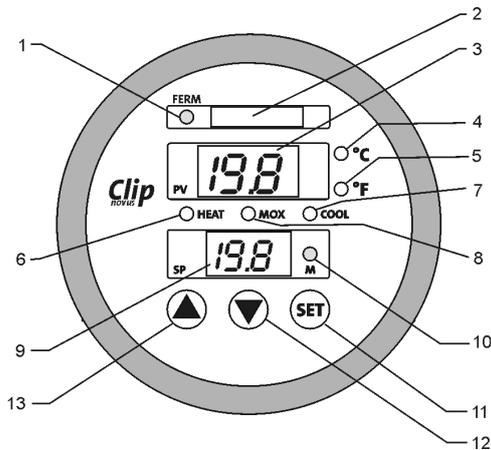
Please keep these instructions in a safe place for future reference. If the product is sold or given to someone else, please ensure the instructions are kept with the device.

Safety instructions in this manual are indicated by the following symbol:



-  The fermentation temperature control system is resistant to water spray. However, do not immerse the device in water or allow it to be in contact with water permanently. Never use pressure or steam washers to clean it.
-  The user must ensure that the electrical connection is fully waterproof. This is done by inserting the connecting cable into a watertight socket in a waterproof manner or by using a waterproof plug, fitted to the connecting cable by the manufacturer and screwed tightly and securely to the respective socket, to connect the fermentation temperature control system.
-  Avoid damaging the front surface coating with pointed or sharp objects, otherwise the device will no longer be resistant to water spray.
-  Make sure the solenoid valves are connected in a watertight manner: Push a rubber seal over the male contacts of the solenoid valve. Place the socket on the male contacts and screw tightly to the valve.
-  Externally protect the 24V supply line for the fermentation temperature control system with a 2.5A medium delay fuse.
-  The socket of the solenoid valve must have integrated 24V AC interference protection to prevent faults occurring in the control electronics.
-  Avoid connecting the bus connections (pink, gray) to the 24V AC supply or any other external sources of supply, as this would otherwise result in the destruction of the bus electronics of the fermentation temperature control system.
-  Do not operate the fermentation temperature control system in close proximity to potentially explosive substances (gases, liquids, dusts...). The device is not approved for these environments.
-  Do not open the fermentation temperature control system. In the unlikely event of a fault, please contact your authorized dealer or service partner.
-  Electrical installation must be carried by an appropriately trained and qualified electrician. The relevant provisions of VDE (German Association for Electrical, Electronic & Information Technologies), national accident prevention regulations, and international safety regulations must be observed at all times.

4. Operating/ Display Elements



1. LED white: Fermentation intensity control active (*)
2. Bar display yellow: Fermentation intensity (*)
3. Digital display red: Actual temperature, parameter value or alarm output
4. LED red: °C
5. LED red: °F
6. LED green: Valve output "heating" active
7. LED red: Valve output "cooling" active
8. LED blue: Micro/Macro-oxygenation active (*)
9. Digital display green: Target temperature, parameter value or menu guidance
10. M-LED (3 colors)
Red: Operating mode heating
Green: Operating mode cooling
Yellow: Operating mode heating and cooling
Yellow flashing: Input mode
Yellow flashing (display 3 and 9 dark):
Operating mode OFF
11. SET button
12. Selection button: Reduce, navigate downwards
13. Selection button: Increase, navigate upwards

(*) optional, only in conjunction with additional devices and the WineMaker's Assistant software. For more information, please contact your authorized dealer or the manufacturer.

5. Operation

Setting the target value

1. Use button 12 or 13 to set the desired target value. The M-LED (10) flashes yellow as long as the controller is in target value input mode.
2. Press the SET button (11) briefly (< 3 s) to confirm the new target value.

The M-LED (10) switches to display the current operating mode. If the new value is not confirmed within 20 seconds, the controller returns to the previous target value.

Setting the operating mode

1. Press the SET button (11) briefly (< 3 s), the upper red display (3) shows α^{\square}
2. Use button 12 or 13 to select the desired operating mode in the lower green display (9) and press the SET button (11) briefly (< 3 s) to confirm it.

The M-LED (10) flashes yellow as long as the controller is in input mode. If confirmation is not given within 20 seconds, the controller returns to the previous operating mode.

Operating modes:

<i>DIS</i>	Display mode, both valve outputs inactive, M-LED (10) off.
<i>HEA</i>	Heating mode, only valve output "heating" active, M-LED (10) red.
<i>COA</i>	Cooling mode, only valve output "cooling" active, M-LED (10) green. (Factory setting!)
<i>HCA</i>	Heating and cooling mode, both valve outputs active, M-LED (10) yellow.
<i>OFF</i>	Controller switched off, no temperature display, M-LED (10) flashes yellow every 5 seconds.

Basic setting of the controller parameters

Caution: Any changes to the controller parameters (except $\mathcal{L}oA$) leads to changes of the controller behavior and may have undesirable effects. Changes should therefore only be carried out by experienced users. In case of doubt, please contact your authorized dealer of the manufacturer.

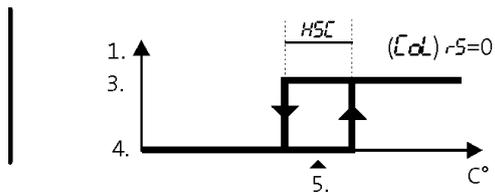
1. Press and hold the SET button (11) until PAS appears on the green display (9). (Password prompt).
2.  Enter (password) and press the SET button (11) to confirm it. The M-LED (10) starts to flash, the green display (9) shows HSH .
3. Use button 12 or 13 to select the control parameter (see below) (green display (9)) and press the SET button (11). The control parameter name switches to the red display (3).
4. Use button 12 or 13 to set the desired parameter value and press the SET button (11) to confirm it. The parameter name re-appears on the green display (9).
5. If you wish to change further parameter values, go back and proceed from point 3; if not, continue with the next point.
6. Use button 12 to select End and press the SET button (11) to return to the normal display.

Control parameter and setting values:

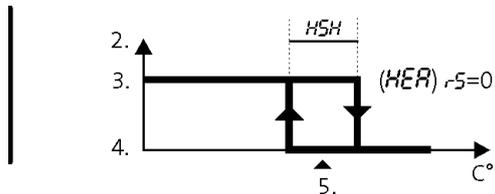
HSH	Control hysteresis for heating mode (0.1...10°C; 0.2...18°F) Factory setting: 0.3°C; 0.6°F
HSC	Control hysteresis for cooling mode (0.1...10°C; 0.2...18°F) Factory setting: 0.3°C; 0.6°F
dbd	Dead zone (0.0...10°C; 0.0...18°F) Factory setting: 0.2°C; 0.4°F
t^P	Time period for P-band mode (32...999s) Factory setting: 300s
t^I	Reset time for PI mode (1...999min) Factory setting: 600min
t^d	Derivative action time for PID mode (1...250min) Factory setting: 150min
r^S	Control structure (0:2/3-point; 1:P-band, clocking; 2:PI; 3:PID) Factory setting: 0
ALR	Alarm difference to the target value (0.2...99.0°C; 0.4...210°F) Factory setting: 5.0°C; 9.0°F
ALH	Alarm hysteresis (0.1...10°C; 0.2...18°F) Factory setting: 0.2°C; 0.4°F
U_n	Temperature unit (0: °C; 1: °F) Factory setting: 0
$\mathcal{L}oA$	Bus address (1...255) Factory setting: 1
End	End parameter input, go to normal operating mode

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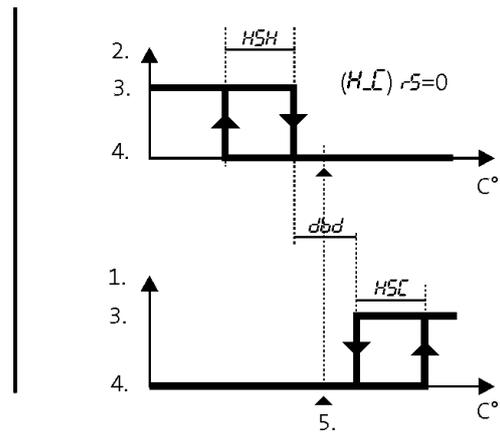
Cooling mode 2-point



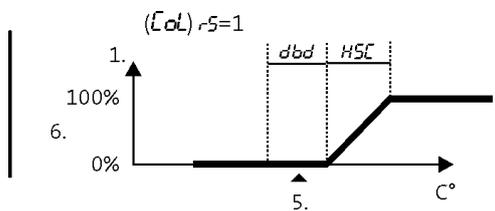
Heating mode 2-point



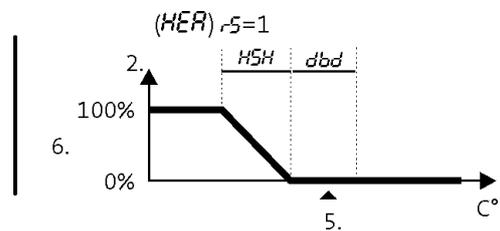
Heating and cooling mode 3-point



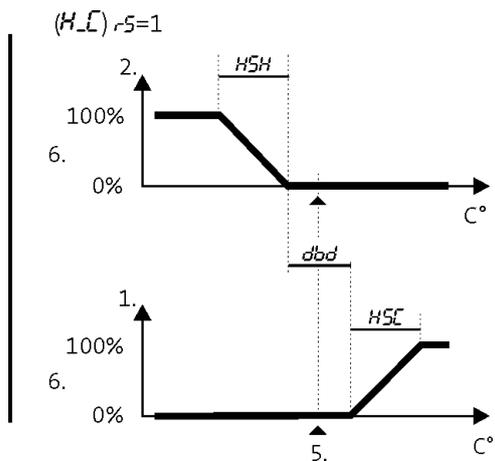
Cooling mode P-band



Heating mode P-band



Heating and cooling mode P-band



Legend

1. Valve output cooling
2. Valve output heating
3. On
4. Off
5. Target value
6. Duty ratio in % of t_p (see parameter)

Data input

Freely definable measured values (e.g. the must weight determined at the tank) can be entered at the controller. With an installed bus system and connected PC, this value is imported, saved, and displayed in conjunction with the "WineMaker's assistant" software (version 2.0 and higher).

1. Press buttons 12 and 13 simultaneously for >3s: The following appears on the red display (3) PdQ
2. On the green display (9), set the input value (0...999) using the button 12 or 13. Press the SET button (11) to confirm the setting. The M-LED (10) flashes during data input.

Brief display of the actual value

If the controller is in the *OFF* operating mode (M-LED (10) flashes yellow every 5 seconds), the current actual value can be displayed on the red display (3) for 20 seconds by pressing button 12 or 13.

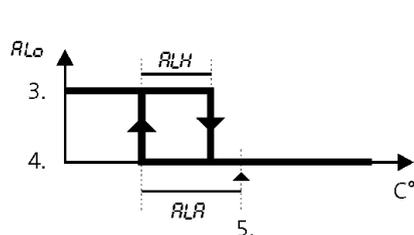
Alarms

Deviating-temperature alarm

RLR	Deviating alarm threshold between the target value SP and the actual value PV
RLH	Hysteresis between activation and cancellation of the deviating alarm
RHi	Alarm excess temperature, alternates with the actual value in the actual value display (3)
RLo	Alarm insufficient temperature, alternates with the actual value in the actual value display (3)

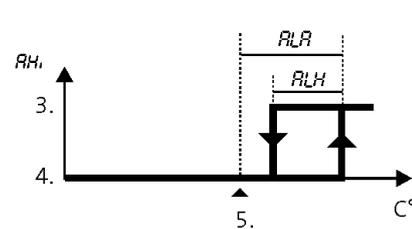
The control functions remain fully functional during a temperature alarm.

Alarm insufficient temperature



- 3. On
- 4. Off
- 5. Target value

Alarm excess temperature



Further alarms

E_{rS}	Temperature sensor error
E_{rP}	Parameter error

In these cases, please contact your authorized dealer or service partner.

Bus address

When using the data bus system, each device must be set to a unique bus address in the network. ($\overline{C0A}$; see Basic setting of the controller parameters).

Control according to fermentation intensity

The fermentation temperature control system is equipped with a bar display for the fermentation intensity. The white LED FERM (1) displays the active fermentation intensity control and the blue LED MOX (8) the active micro/macro-oxygenation. These functions are effective in conjunction with the "WineMaker's Assistant" software (version 2.0 and higher) and corresponding additional devices. For more information, please contact your authorized dealer or service partner.

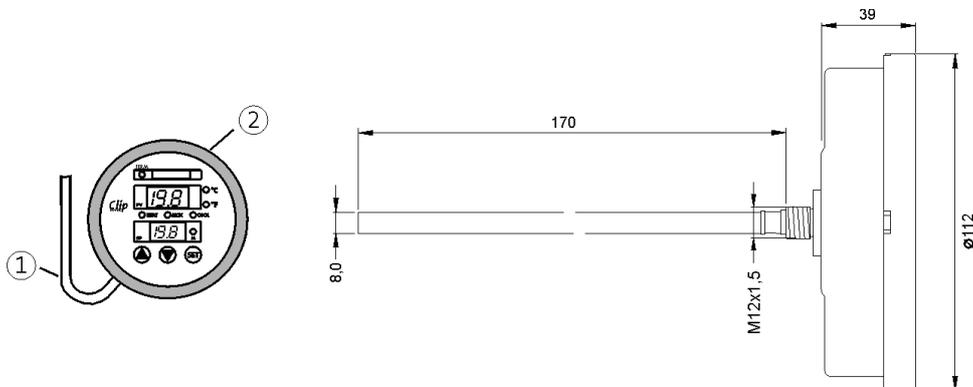
6. Installation

Safety instructions



Electrical installation must be carried by an appropriately trained and qualified electrician. The relevant provisions of VDE (German Association for Electrical, Electronic & Information Technologies), national accident prevent regulations, and international safety regulations must be observed at all times.

Installation dimensions



Installing the controller

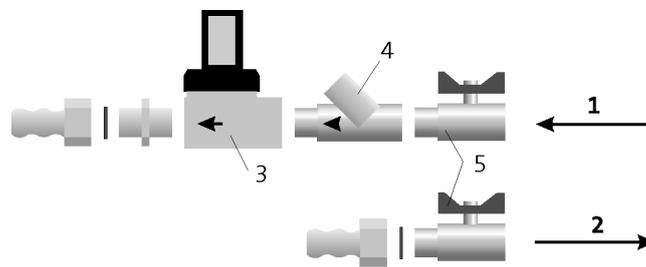
Install the controller as close as possible to the fill level indicator tube. The connecting cable can be concealed or routed upwards at this point.

1. Screw the controller together with Teflon tape into the supplied immersion sleeve or into a pre-installed immersion sleeve at the tank.
2. Align the controller, ensuring that the front elements are arranged horizontally.
3. Make sure to incorporate a downward hanging drip loop into the connecting cable (see illustration^①)
4. **Caution:** Make sure that the bayonet ring (see illustration^②) is closed properly, otherwise protection against water spray is not guaranteed.

Sanitary connection of the solenoid valve

The solenoid valves switch the cooling or heating medium supply to the sprinkling ring or the heat exchanger in or on the tank.

1. Use a dirt trap to protect the solenoid valves against stray particles and contamination. Particles in the seal seat of the solenoid valve can hinder reliable closing, resulting in unwanted cooling or heating of the fermentation product.
2. **Caution:** Engage the solenoid valve **in the flow** of the hydraulic system, otherwise pressure surges in the piping system may damage the heat exchanger.
3. Arrange the components in a fashion that facilitates maintenance.
4. **Caution:** Observe the specified flow direction of the solenoid valve and the dirt trap (arrow). Incorrect allocation will result in malfunctioning.



- | | |
|-------------------|----------------|
| 1. Flow | 4. Dirt trap |
| 2. Return flow | 5. Ball valves |
| 3. Solenoid valve | |

Electrical connection of the solenoid valve

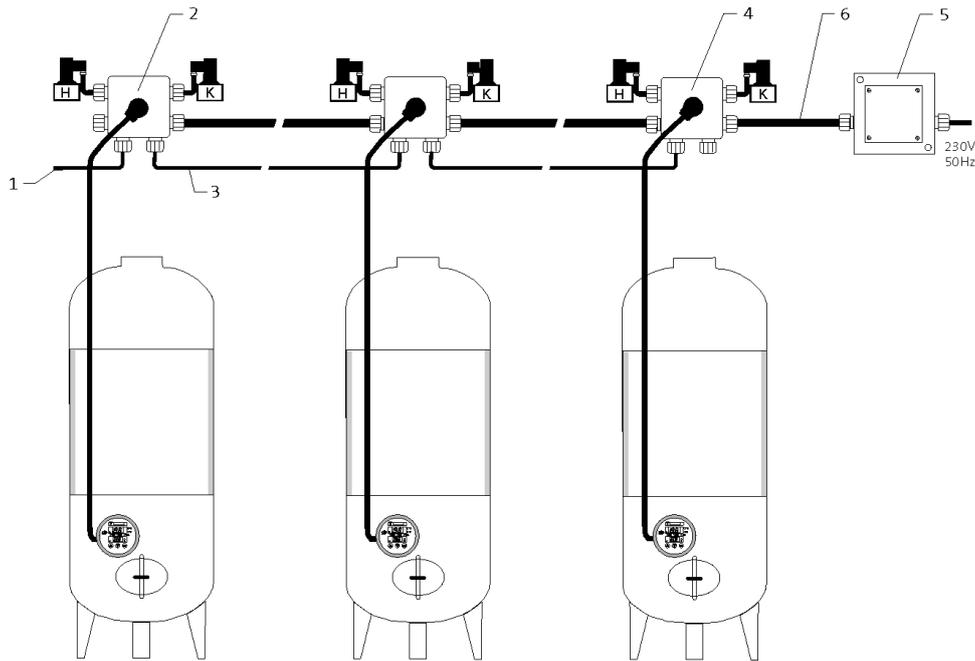


Make sure the solenoid valves are connected in a watertight manner: Push a rubber seal over the male contacts of the solenoid valve. Place the socket on the male contacts and screw tightly to the valve.



The socket of the solenoid valve must have integrated 24V AC interference protection to prevent faults occurring in the control electronics.

Installation diagram



1. Converter USB/bus; PC connection
2. Plug or clamp connection; watertight
3. 2-wire data cable; LIYCY 2x0.34mm² (TP)
4. Last socket with 120 Ohm terminating resistor (only for bus cable)
5. Power transformer
6. 2-wire cable for 24V AC: 2 x 2.5mm²

Installing the electricity supply

1. Install the optional safety transformer included or use an alternative 24V AC source of supply.
2. Position the 24V AC source of supply as close as possible to the connecting box to reduce voltage losses caused by long cables.
3. Use cable cross sections of at least 1.5mm², preferably 2.5mm², for the 24V AC cable.
4. Wire the controller according to the connection diagram below.

Special terminal boxes and sockets are available to facilitate simple and correct wiring. Please contact your authorized dealer or the manufacturer for more information.

Installing the bus system

The control system is equipped with a data bus that allows all the controllers to communicate with a connected PC. A software package with corresponding components is optionally available for this purpose. A LIYCY 2x0.34mm² cable (TP, paired stranded conductors) is recommended as the data cable. Up to 255 bus devices can be operated in the network, which is divided into several sub-networks, each with a maximum of 32 controllers, by various USB/BUS converters. Each sub-network must be routed as a linear line, branch connections are not permitted. The data cable starts at the USB/BUS converter and finishes at the terminal of the last controller. A 120 Ohm terminating resistor must be fitted to the two bus lines at this point. The maximum cable length for each sub-network is 1,200 meters.

Caution: Mains or external voltage must not be applied to the two bus lines (pink, gray). This would otherwise cause the destruction of the bus electronics.

Caution: Make sure that the data cable inside the applied terminal box is insulated with heat shrink tubing to prevent short circuits.

Connecting the transformer on the mains side

The primary side of the transformer is connected to the AC system 230V/50Hz. The series fuse has a maximum rating of 16A, the recommended cable cross section is 1.5mm². A double-pole mains switch can be integrated into the supply line to disconnect the system from the mains power supply. In order to avoid interference, route the connecting cable for the transformers separate from electrical cables.



Electrical installation must be carried by an appropriately trained and qualified electrician. The relevant provisions of VDE (German Association for Electrical, Electronic & Information Technologies), national accident prevent regulations, and international safety regulations must be observed at all times.

Connection for the combined heating and cooling valve

An additional wire jumper between the output terminals for heating and cooling is required $\text{\textcircled{1}}$ if a combined heating and cooling valve is to be used (see Connection diagram).

In this case, the controller must not be operated in heating and cooling mode $H_{-}L$.

It is important that reconfiguration of the controller goes hand in hand with a controlled changeover of the water source to "cooling water" or "heating water".



Incorrect allocation of the cooling medium results in the control system being "jumbled up", i.e. heating takes place with cooling water in heating mode and heating water is used for cooling in cooling mode.

Commissioning

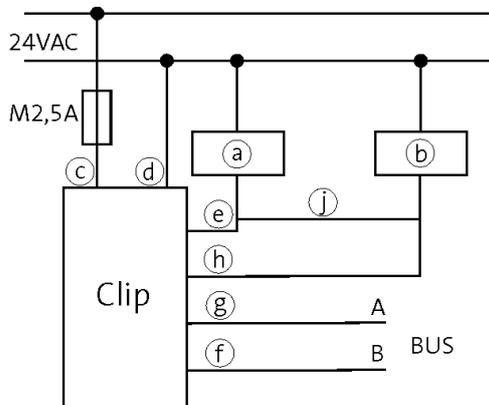
1. Make sure the cooling water system has been installed correctly prior to commissioning the control system.
2. Check correct assignment of the solenoid valve, the tank, and the controller.
3. If a bus cable has been installed, make sure it is connected properly (pay attention to the correct polarity).
4. Connect the control system to the 230V AC mains power supply.

If everything has been connected properly, the controllers will display the current target and actual values after a few seconds.

5. Ensure the operating mode is correct; alter it, if necessary.
6. Adjust the target value, thus causing each controller to switch the solenoid valve on and off.
7. If the bus system is to be applied, set a unique bus address in the system for each controller (see Basic setting of the controller parameters) and use the (optional) included WineMaker's Assistant software to check the availability of the controller. The required functions can be found in the program.

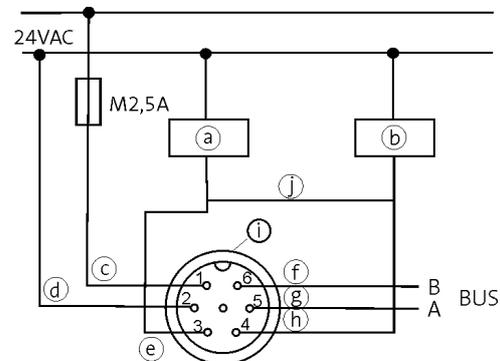
Connection diagram

Variant: Loose cable end



- (a) Solenoid valve heating
- (b) Solenoid valve cooling
- (c) White
- (d) Yellow
- (e) Brown

Variant: Connector (top view of the contact pins)



- (f) Gray
- (g) Pink
- (h) Green
- (i) Connector
- (j) Jumper for combined valve for cooling and heating (a or b not required)

7. Disposal



All packaging material used is environmentally friendly. An old product must not be disposed of in normal household waste. Instead it must be handed over to an applicable collection point for the recycling of electrical and electronic equipment. Please contact your local authority for more information on environmentally-friendly and correct disposal of the device.

8. Technical Data

Table 1. Technical Data

Voltage	24V AC +/-10%
Fuse	M 2.5A
Power input	4V A (without load)
Output	Solenoid valve 24V AC/16V A
Power control	Via relays
Resolution	0.1°C
Accuracy	0.3°C in the range of 10°C to 30°C, otherwise 0.5°C
Display range	-9.9°C....+99.9°C
Calibrated range	0°C....+40°C
Type of control	Two point (H or C) Three point (H and C) P-band (clocking) PI, PID
Protection rating	IP54
Enclosure dimensions	d 188mm x 32mm
Probe shaft	Shaft length 170mm Clamping contour and screw-in thread M12x1.5
Enclosure material	Stainless steel 1.4301
Front surface coating	PVC
Electrical connection	6m open-ended cable or with a connector
Interface	Bus (insulated) Details on request

9. Troubleshooting

The warranty will be void if the user opens the fermentation temperature control system during the warranty period.

Please observe the following safety instructions.



Electrical installation must be carried by an appropriately trained and qualified electrician. The relevant provisions of VDE (German Association for Electrical, Electronic & Information Technologies), national accident prevent regulations, and international safety regulations must be observed at all times.

Problem	Cause	Remedy
Total system breakdown (no display for any of the controllers in the system)	Loss of the mains voltage	Check the mains voltage and the upstream fuse
	Failure of the only transformer for the 24V AC supply	Check the supply voltage at the secondary connection of the transformer with an applied primary voltage. Replace the transformer, if necessary.
Breakdown of a part of the system (no display for some of the controllers in the system)	If several transformers generate the 24V AC supply, failure of one or more transformers	Check the supply voltage at the secondary connections of the transformers with an applied primary voltage. Replace any defective transformers, if necessary.
Failure of a single controller (no display)	Failure of fuse M2.5A in the socket (see circuits diagrams)	Replace the fuse, renewed failure may be the result of a short circuit
	Controller defective	Please contact your authorized dealer or the manufacturer.
Loss of bus communication for all the controllers in the system	Short circuit in the data cable	Check the cable for short circuiting
	Interruption of the data cable between the first controller in the system and the PC	Check the cable for continuity
	Failure of the USB converter	Please contact your authorized dealer or the manufacturer.
	Problems with the system configuration at the PC or with the software	Please contact the software manufacturer.

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Loss of bus communication for a group of controllers	Interruption of the bus cable connection in front of the first affected controller (as viewed from the PC)	Check for an interruption in the bus connection between the first affected controller and the previous one (as viewed from the PC)
Loss of bus communication of a single controller	The bus address set in the controller does not correspond with the one set in the software.	Make sure the bus address in the controller and the one in the software correspond. Please note: Each address can only be assigned once.
	Controller defective	Please contact your authorized dealer or the manufacturer.
Change in liquid temperature contrary to the expected direction for activated control	Soiling of the dirt trap	Open and clean the dirt trap.
	Incorrect operating mode set: Cooling instead of heat or vice versa	Set the correct operating mode.
	Insufficient cooling or heating capacity due to system breakdown or closed non-return valves in the cooling/heating circuit	Check the cooling or heating source as well as the non-return valves.
	Solenoid valve does not switch	Check whether voltage is applied to the solenoid valve, check the connecting cables, if necessary Check whether the solenoid valve opens and closes properly on the water side. Replace the solenoid valve, if necessary.

10. Warranty and Service

The product is warranted against defects for one year from the date of purchase. The warranty is limited to the product only. Any further liability, e.g. for shipping costs and consequential damage, is excluded.

The product was manufactured with the utmost care and thoroughly checked and tested prior to leaving our premises. In the unlikely event of defects, please contact your authorized dealer.

The warranty will not cover any defect, damage or breakdown resulting from misuse and non-adherence to instructions, or alteration, customization, or repair by unauthorized persons.

The warranty period shall neither be extended nor renewed beyond the one-year period if a warranty claim is made.

In order to be eligible to receive warranty service, you must present the defective product and your receipt of purchase.

Service address:



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