Glas-Col®

TEMP-O-TROL™

OPERATING
INSTRUCTIONS

MODELS
TOT-1200
TOT-1200A

SAFETY PRECAUTIONS

Warning!
This instrument contains hazardous operating voltages. Disconnect the unit from the main power supply and the inputs when installing o avoid electrical shock.

Caution!

- *This instrument is designed for use at 120 VAC 50/60 Hz.*
- *Avoid using this instrument in combustible or explosive gaseous atmospheres.*
- *Avoid using this instrument in a corrosive environment.*
- *Avoid exceeding the specified operating temperature. (See specifications.)*
- *Avoid exceeding the specified maximum total electrical loading for this instrument. (See specifications.)*
- *Avoid installing the instruments where it is likely to come into contact with steam or condensing vapors.*
- *Avoid installing the instruments where it is likely to come into contact with conductive dust and particles.*
- *Replace the fuse only with a fuse of the same specified voltage, current and type (See specifications.)*
- *Use removable line cords with he same specification as the line cord supplied with the instrument. (See specifications.)*
- *It is always recommended that every lab temperature controller be used with an independent high-temperature cut-off device such as an Over-Temp Probe.*

PRODUCT OVERVIEW

The Glas-Col Temp-O-Control ™ Model TOT-1200 is a fully programmable microprocessor-based temperature controller that provides:

> PID Control
> Automatic Tuning
> Thermocouple input
> Multifunction Alarm (optional)
> 1200Watt Absolute Maximum Output Capacity
> Single interval ramp and soak function.

DESCRIPTION

FRONT PANEL CONTROLS AND CONNECTIONS

1) Power Switch -   Controls the main power to the unit

2) Controller -   Allows user to program the temperature set point variables and system alarms and to monitor the Process temperature.

3) TC Jack -   This is a color-coded miniature thermocouple panel jack for TC connection to the controller.

4) Output Led -   This indicates that power is being applied to the output receptacle.

5) Alarm Switch -   Turns audible alarm ON or OFF. This does not affect the alarm display on controller module. Only on TOT-1200A models.

6) Output-   This is a standard NEMA 5-15 receptacle switched by the controller. This output is the same voltage and frequency as applied to the unit.

REAR PANEL CONROLS AND CONNECTIONS

1) Lab Rod Clamp -   Can be used to mount the Temp-O-Control on an equipment frame. This will allow the user more bench space. The clamp will mount to any ½ inch diameter rod.

2) Alarm -   This is a Sonalert device. This alarm is turned ON and OFF by the Front Panel switch. Only on TOT-1200A models.

3) Fuse -   Protects against circuit overload. (See specifications for fuse and load specifications.)

4) Power Receptacle -   Accepts a removable type line-cord with a three prong grounded plug, for use in standard 120 Volt, 15 amp wall receptacles.

Caution!
Use only the specified replacement line cords. (See specifications for the line cord ratings.)

CONTROLLER MODULE DESCRIPTION

The illustration above is of the front panel controller module on the Model TOT-1200 Temperature Controller. The table that follows is an explanation of the display, indicators and switches.

1. Display -   **Display the Process Temperature (PT), the Set Point Variable (SP), Programming variables, codes and Error messages.**

2. Main Setpoint -   **This indicator will illuminate when power is applied to the output receptacle. This is controlled by the Set Point Variable One (SP1).**

3. Alarm Setpoint -   This control will illuminate the number 2 on the display when the alarm is triggered. This is controlled by the A.Hi and A.Lo setting in operations menu.

4. Enter Key -   All menu items and program variables are selected and entered using this key with either the up or down arrow key.

5. Down Arrow -   Down arrow will either step down in a menu or decrease the program variable when used with the enter key.

6. Up Arrow -   Up arrow will either set up in a menu or increase the program variable when used with the enter key.

INSTALLATION

Warning!
This instrument contains hazardous operating voltages. Disconnect the unit from the main power supply and the inputs when installing to avoid electrical shock.

Note
The absolute maximum output power is 1200 Watts resistive.
Using a variac with this instrument may permanently damage the unit.

Caution!
It is always recommended that every lab temperature controller be used with an independent high-temperature cut-off device such as an Over-Temp Probe.

When you receive your instrument, carefully unpack and inspect your instrument for damage and missing hardware. Take the time to fill out the warranty registration card and return it to us. Should anything appear to be missing or the unit appears to be damaged, contact us immediately.

Take the time to familiarize yourself with the controls and inputs to the instrument. The instrument can be mounted on lab rods and ring stands using the mounting clamp on the rear of the unit. Mount the unit securely before connecting the unit to the AC line source.

OPERATION

The operational descriptions have been illustrated with displays from the controller. The nature of a seven-segment display makes it difficult to create and convey messages. At the end of this manual are all of the menu items available in this controller.

INITIAL POWER UP

When the power is first turned ON, all of the characters will appear on the Display. This is the normal segment test mode.

In approximately 5 seconds the process temperature (PT), as read by the thermocouple, will appear on the display in red and the set point temperature will appear on the right side of the display in green.

Congratulations you are now ready to start controlling your process.

SETTING THE SET POINT

Coming from the factory, the Set Point is set a 50.0°C. To adjust the Set Point temperature, use the UP and DOWN arrow. The SET POINT will be displayed in green on the right side of the display.

Left Display:
In the Operations Menu, displays the process value, otherwise displays the value of the parameter in the left display.

WATLOW   EZ-ZONE®
8.8.8.8 8.8.8.8

Right Display:
Indicates the set point or output power value during operation, or the parameter whose value appears in the right display.

Note
The Set Point changes slow at first then picks up speed after 3 seconds.
So if you're only changing a few degrees, change the Set Point by just pushing the appropriate arrow key.

DESCRIPTION OF AUTO TUNING FUNCTION

Auto tuning is an internal algorithm that allows your controller to learn the characteristics of your set-up. It will determine the right amount of power to apply to your heating device to bring your process to the set point temperature in the least amount of time without overshooting and will regulate the temperature as tightly as possible. It is important for you to understand the mechanism of Proportional, Integral, and Derivative Control in order to understand the instrument's ability to control your process.

To auto tune the system you press the advance button one time and AUT will appear on display. Use arrow buttons and change to YES and then press the infinity button. The instrument immediately goes into the AUTO TUNE mode and will run for 30 min. to 90 minutes. When the AUTO TUNE mode is finished it will stop flashing between the auto tune screen and operation screen.

* Since ON-OFF action (two-position action) takes place in the auto tune procedure, the temperature of the process material being heated may change greatly. Do not carry out the auto tune if the process does not allow a significant variation of the process temperature. Use a material that is similar but expendable for the auto tune procedure.
* Re-run the auto tune again if the Set-point Value temperature (SV) is significantly changed, the upper or lower PV temperature has changed, or if the controlled equipment is changed.

DESCRIPTION OF PID CONTROL

"PID CONTROL" stands for Proportional with Integral and Derivative control. It is a mathematical method of predicting how much power must be applied to the system to reach the Set-point temperature with a minimum of temperature oscillation (overshooting and undershooting the set point temperature.) A brief description of each component of PID Control is discussed below:
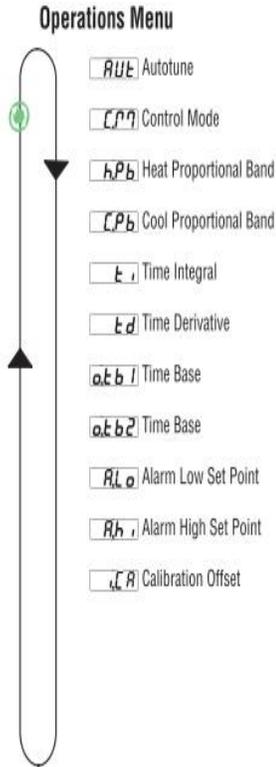
Proportional Control Band: The proportional band is that area around the set-point value temperature where the power supplied to the output is neither fully ON nor fully OFF. The proportional band can be moved to higher or lower temperatures by the integral and derivative control parameters. For ON/OFF control, set the proportional band to "0".

Integral Time (reset): The Integral Time determines the speed at which a corrective increase or decrease in output is made to compensate for the difference between the equilibrium temperature and the Set-point temperature (called he "offset"). The more Integral Time entered, the slower the offset is corrected. Conversely, the less Integral Time entered, the faster the offset is corrected. The Integral Time value should eliminate the offset without overcompensating, leading to oscillation.

Derivative Time (rate): The derivative time is that time used in calculating the rate of change and the thermal lag. The derivative time helps to eliminate overshoot, which result in response to system upsets. The Derivative action dampens proportional and integral action as it anticipates where the process should be. The more derivative time entered the more damping action. Enter as much Derivative Time as necessary to eliminate overshoot without over-damping the process, which will result in process oscillation.

Control Menu Settings

Upon power up of the control, using the advance key will scroll through the various prompts found in the Operations Menu. At any point within the Operations Menu to return to the default display push the Infinity ⊙ key.

Operations Menu

- AUt Autotune
- CM Control Mode
- hPb Heat Proportional Band
- CPb Cool Proportional Band
- ti Time Integral
- td Time Derivative
- o.tb1 Time Base
- o.tb2 Time Base
- A.Lo Alarm Low Set Point
- A.hi Alarm High Set Point
- i.CA Calibration Offset

Operations Menu
16th & 32nd DIN PID Controller

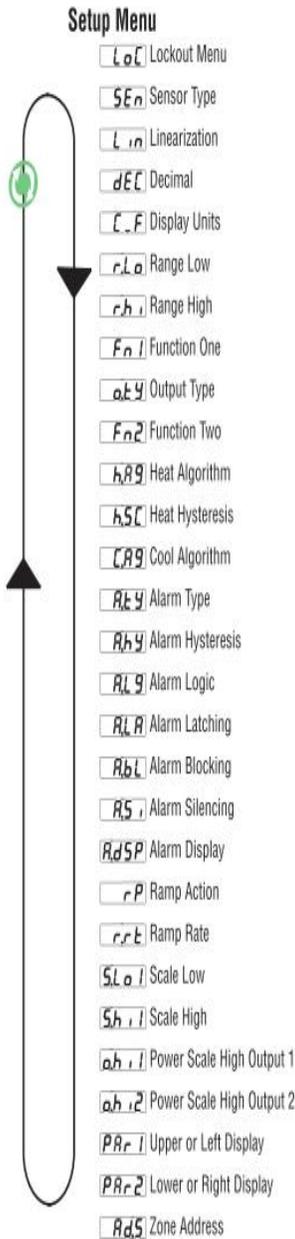| Display	Parameter Name Description	Range (Defaults are shown bold)
AUt [AUt]	**Autotune** Start an autotune. While active the upper or left and lower or right display will flash `tUn 1` and `Attn`. Appears if: Heat or cool algorithm set to PID	`no` **No** `YES` Yes
CM [C.M]	**Control Mode Active** View the current control mode. Appears if: Always	`oFF` Off `AUto` **Auto** `MAn` Manual
hPb [h.Pb]	**Heat Proportional Band** Set the PID proportional band for the heat outputs. Appears if: Heat algorithm set to PID	0 to 9,999.000°F or units 0 to 5,555.000°C **Units, 25.0°F or 14.0°C**
CPb [C.Pb]	**Cool Proportional Band** Set the PID proportional band for the cool outputs. Appears if: Cool algorithm set to PID	0 to 9,999.000°F or units 0 to 5,555.000°C **Units, 25.0°F or 14.0°C**
ti [ti]	**Time Integral** Set the PID integral for the outputs. Appears if: Heat or cool algorithm set to PID	0 to 9,999 seconds per repeat **180.0**
td [td]	**Time Derivative** Set the PID derivative time for the outputs. Appears if: Heat or cool algorithm set to PID	0 to 9,999 seconds **0.0 seconds**
o.tb1 [o.tb1]	**Time Base Output 1** Set the time base for fixed-time-base control. Appears if: Output 1 set to heat or cool with control algorithm set to PID.	0.1 to 60.0 seconds (solid-state relay or switched dc) 5.0 to 60.0 seconds (mechanical relay & NO-ARC power control) **1 sec. [SSR & sw dc], 20.0 sec. [mech. relay & NO-ARC]**
o.tb2 [o.tb2]	**Time Base Output 2** Set the time base for fixed-time-base control. Appears if: Output 2 set to heat or cool with control algorithm set to PID.	0.1 to 60.0 seconds (solid-state relay or switched dc) 5.0 to 60.0 seconds (mechanical relay & NO-ARC power control) **1 sec. [SSR & sw dc], 20.0 sec. [mech. relay & NO-ARC]**
A.Lo [A.Lo]	**Alarm Low Set Point** Process - set the process value that will trigger a low alarm. Deviation - set the span of units from the closed loop set point that will trigger a low alarm. Appears if: If Alarm Type (A.ty) is set to Process or Deviation Alarm	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C **Units, 32.0°F or 0.0°C**
A.hi [A.hi]	**Alarm High Set Point** Process - set the process value that will trigger a high alarm. Deviation - set the span of units from the closed loop set point that will trigger a high alarm. Appears if: If Alarm Type (A.ty) is set to Process or Deviation Alarm	-1,999.000 to 9,999.000°F or units -1,128.000 to 5,537.000°C **Units, 300.0°F or 150.0°C**
i.CA [i.CA]	**Calibration Offset** Set an offset value for a process output. Appears if: Always	-1,999.000 to 9,999.000°F or units -1,110.555 to 5,555.000°C **0.0**

To enter the Setup Menu push and hold the up and down arrow keys for approximately 3 seconds. Once there, push the green advance key to scroll through to the prompt of choice and then use the up and down arrow keys to change the range. At any point within the Setup menu to return to the default display push the Infinity ⊕ key.

Setup Menu

- **LoC** Lockout Menu
- **SEn** Sensor Type
- **Lin** Linearization
- **dEC** Decimal
- **C_F** Display Units
- **r.Lo** Range Low
- **r.hi** Range High
- **Fn1** Function One
- **o.ty** Output Type
- **Fn2** Function Two
- **h.Ag** Heat Algorithm
- **h.SC** Heat Hysteresis
- **C.Ag** Cool Algorithm
- **At.y** Alarm Type
- **A.hy** Alarm Hysteresis
- **AL.g** Alarm Logic
- **AL.A** Alarm Latching
- **A.bL** Alarm Blocking
- **AS.i** Alarm Silencing
- **A.dSP** Alarm Display
- **rP** Ramp Action
- **r.rt** Ramp Rate
- **S.Lo1** Scale Low
- **S.hi1** Scale High
- **o.h.i1** Power Scale High Output 1
- **o.h.i2** Power Scale High Output 2
- **PAr1** Upper or Left Display
- **PAr2** Lower or Right Display
- **Ad.5** Zone Address

Setup Menu
16th & 32nd DIN PID Controller

Display	Parameter Name Description	Range (Defaults are shown bold)
LoC [LoC]	**Lockout Menu** Set the security clearance level. The user can access the selected level and all lower levels. Appears if: Always	1 to 5 1 Operations Menu (read only, A/M button disabled)* 2 Operations Menu (A/M button disabled, Set point R/W)* 3 Operations Menu (A/M button enabled, Set point R/W, Control Mode R/W)* 4 Operations Menu R/W access* **5 Operations Menu and Setup Menu full R/W access** *You can change the security level at any level
SEn [SEn]	**Sensor Type** Set the analog sensor type to match the device wired to this input. Appears if: Always	**tC Thermocouple** voLt Volts dc mA Milliamps dc rᗡ.1H RTD 100 Ω
Lin [Lin]	**Linearization** Set the linearization to match the thermocouple type wired to this input. For example, select ⬚H for a type K thermocouple. Appears if: Sensor Type is set to Thermocouple.	b B J J t T c C H K d D n N E E r R F F S S
dEC [dEC]	**Decimal** Set the precision of the displayed value. Appears if: Always	0 Whole 0.0 Tenths 0.00 Hundredths
C_F [C_F]	**Display Units** Select which units will be displayed. Appears if: Always	F °F C °C
r.Lo [r.Lo]	**Range Low** Set the low range of the set point. Appears if: Always	-1,999.000 to 9,999.000 **0.0**
r.hi [r.hi]	**Range High** Set the high range of the set point. Appears if: Always	-1,999.000 to **9,999.000**
Fn1 [fn1]	**Function of Output 1** Select which function will drive this output. Appears if: If output 1 is ordered	oFF Off CooL Cool hEAt Heat ALrm Alarm
o.ty [o.ty]	**Output Type** Select whether the process output will operate in volts or milliamps. Appears if: A process output (PM _ C _ F _- _ AAAB _ _)	voLt **Volts** mA Milliamps

To enter the Setup Menu push and hold the up and down arrow keys for approximately 3 seconds. Once there, push the green advance key to scroll through to the prompt of choice and then use the up and down arrow keys to change the range. At any point within the Setup menu to return to the default display push the Infinity ☺ key.

Setup Menu

[LoC]	Lockout Menu
[SEn]	Sensor Type
[Lin]	Linearization
[dEC]	Decimal
[C_F]	Display Units
[rLo]	Range Low
[rhi]	Range High
[Fn1]	Function One
[oty]	Output Type
[Fn2]	Function Two
[h.A9]	Heat Algorithm
[h5C]	Heat Hysteresis
[C.A9]	Cool Algorithm
[Aty]	Alarm Type
[Ahy]	Alarm Hysteresis
[AL9]	Alarm Logic
[ALA]	Alarm Latching
[AbL]	Alarm Blocking
[ASi]	Alarm Silencing
[Ad5P]	Alarm Display
[rP]	Ramp Action
[rrt]	Ramp Rate
[SLo1]	Scale Low
[Shi1]	Scale High
[ohi1]	Power Scale High Output 1
[ohi2]	Power Scale High Output 2
[PAr1]	Upper or Left Display
[PAr2]	Lower or Right Display
[Ad5]	Zone Address

Setup Menu
16th & 32nd DIN PID Controller

Display	Parameter Name Description	Range (Defaults are shown bold)
[Fn2] [fn2]	**Function of Output 2** Select which function will drive this output. Appears if: If output 2 is ordered	[oFF] Off [CooL] Cool [hEAt] Heat [ALM] Alarm
[h.A9] [h.Ag]	**Heat Algorithm** Set the heat control method. Appears if: Output 1 or 2 set to heat	[oFF] Off [Pid] **PID** [onoF] On-Off
[h5C] [hSC]	**Hysteresis (Heat & Cool)** Set the control switching hysteresis for on-off control. This determines how far into the "on" region the process value needs to move before the output turns on. Appears if: Heat or Cool Algorithm is set to On-Off.	0 to 9,999.000°F or units 0 to 5,555.000°C **Units, 3.0°F or 2.0°C**
[C.A9] [C.Ag]	**Cool Algorithm** Set the cool control method. Appears if: If Output 1 or 2 is set to cool	[oFF] Off [Pid] PID [onoF] On-Off
[Aty] [A.ty]	**Alarm Type** Select how the alarm will or will not track the set point. Appears if: Always	[oFF] Off [PrAL] Process Alarm [dEAL] Deviation Alarm
[Ahy] [A.hy]	**Alarm Hysteresis** Set the hysteresis for an alarm. This determines how far into the safe region the process value needs to move before the alarm can be cleared. Appears if: When alarm type is set to process or deviation alarm	0.001 to 9,999.000°F or units 0.001 to 5,555.000°C **Units, 1.0°F or 1.0°C**
[AL9] [A.Lg]	**Alarm Logic** Select what the output condition will be during the alarm state. Appears if: Always	[ALC] **Close on Alarm** [ALo] Open on alarm
[ALA] [A.LA]	**Alarm Latching** Turn alarm latching on or off. A latched alarm has to be turned off by the user. Appears if: When alarm type is set to process or deviation alarm	[nLAt] **Non-Latching** [LAt] Latching
[AbL] [A.bL]	**Alarm Blocking** Select when an alarm will be blocked. After startup and/or after the set point changes, the alarm will be blocked until the process value enters the normal range. Appears if: When alarm type is set to process or deviation alarm	[oFF] Off [Str] Startup [StPt] Set Point [both] Both
[ASi] [A.Si]	**Alarm Silencing** Turn alarm silencing on to allow the user to disable the output tied (configured) to this alarm Appears if: When alarm type is set to process or deviation alarm	[oFF] Off [on] On

To enter the Setup Menu push and hold the up and down arrow keys for approximately 3 seconds. Once there, push the green advance key to scroll through to the prompt of choice and then use the up and down arrow keys to change the range. At any point within the Setup menu to return to the default display push the Infinity ∞ key.

Setup Menu

LoC Lockout Menu
SEn Sensor Type
Lin Linearization
dEC Decimal
C.F Display Units
r.Lo Range Low
r.hi Range High
Fn1 Function One
o.tY Output Type
Fn2 Function Two
h.A9 Heat Algorithm
h.SC Heat Hysteresis
C.A9 Cool Algorithm
A.tY Alarm Type
A.hY Alarm Hysteresis
AL9 Alarm Logic
ALA Alarm Latching
AbL Alarm Blocking
AS.i Alarm Silencing
A.dSP Alarm Display
rP Ramp Action
r.rt Ramp Rate
S.Lo1 Scale Low
S.hi1 Scale High
o.hi1 Power Scale High Output 1
o.hi2 Power Scale High Output 2
PAr1 Upper or Left Display
PAr2 Lower or Right Display
Ad5 Zone Address

Setup Menu
16th & 32nd DIN PID Controller

Display	Parameter Name Description	Range (Defaults are shown bold)
A.dSP [A.dSP]	**Alarm Display** — Display an alarm message when an alarm is active. Appears if: When alarm type is set to process or deviation alarm	oFF Off on **On**
rP [rP]	**Ramp Action** — Select when the controller's set point will ramp to the defined end set point. Appears if: Always	oFF **Off** Str Startup StPt Set Point Change both Both
r.rt [r.rt]	**Ramp Rate** — Set the rate for the set point ramp. Set the time units for the rate with the Ramp Scale parameter. Appears if: Ramp Action is set to Startup, Set Point or Both.	**1.0**°F degrees or units per hour **1.0**°C
S.Lo1 [S.Lo1]	**Scale Low Output 1** — Set minimum value of output 1 range. Appears if: Output 1 is a *Process* set to heat or cool	-100.0 to 100.0 **0.0**
S.hi1 [S.hi1]	**Scale High Output 1** — Set maximum value of output 1 range. Appears if: Output 1 is a *Process* set to heat or cool	-100.0 to 100.0 **10.0**
o.hi1 [o.hi1]	**Power Scale High Output 1** — Set maximum value of output 1 range. Appears if: Output 1 is *Switched* and set to heat or cool	0.0 to 100% **100.0**
o.hi2 [o.hi2]	**Power Scale High Output 2** — Set maximum value of output 2 range. Appears if: Output 2 is *Switched* and set to heat or cool	0.0 to 100% **100.0**
PAr1 [PAr1]	**Upper or Left Display** — Select parameter to display. Appears if: Always	ACPv **Active Process Value** nonE none
PAr2 [PAr2]	**Lower or Right Display** — Select parameter to display. Appears if: Always	ACSP **Active Set Point** Ah.i Alarm High Set Point ALo Alarm Low Set Point nonE None
Ad5 [Ad.S]	**Zone Address - Standard Bus Communication** — Set zone address from 1-16. Appears if: Always	1-16 **1**

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TROUBLESHOOTING

There are no serviceable parts in this unit. Repairs, modifications, alterations, additions and other unauthorized changes to this unit will void the warranty.

POWER LOSS
If the instrument loses power check, the main fuse is at the rear of the instrument. Replace it with the exact replacement type. If the unit continues to blow fuses, consult the factory.

POOR TEMPERATURE CONTROL
If your instrument appears to have poor control of the process there can be a number of reasons not necessarily related to instrument failure. If you have gone through your set-up and confirmed your settings, consult the factory. Be prepared to discuss your application and set up in detail. There maybe something we can do to solve the problem.

INACCURATE READINGS
Your instrument is or was factory calibrated to our stated specifications. Field re-calibration is not possible since this is a software re-calibration. The accuracy of the overall system depends on the accuracy of your thermocouple, which is independent of the controller. Thermocouples have varying grades of accuracy, which must be considered. Check your thermocouple and its extension wiring. If your instrument is reading inaccurately, return it to the factory for repair and/or re-calibration.

MAINTENANCE

Like any other essential piece of equipment you should inspect your instrument at least once a year and test it for its features and functions. Items that should be checked periodically are:

1. Missing or loose enclosure hardware
2. Line Cord for fraying, cracks, heat damage
3. AC input connector for cracks and wear
4. Smooth switch function
5. Display Segments
6. Front panel connectors

ERROR CODES

Responding to a Displayed Message (16th or 32nd DIN)

An active message will cause the display to toggle between the normal settings and the active message in the upper or left display and [Attn] in the lower or right display. Your response will depend on the message and the controller settings. Some messages, such as Tuning, indicate that a process is underway. If a message is generated in the right or lower display that can be cleared (such as [AL.h 1]), simply push the infinity ☺ key to execute the action ([CLr]).

[AL.L 1] Alarm Low 1 (sensor input below low alarm set point)

[AL.h 1] Alarm High 1 (sensor input above high alarm set point)

[AL.E 1] Alarm Error 1 (alarm state cannot be determined due to lack of sensor input)

[Er.1 1] Error Input 1 (sensor is not providing a valid signal to the control)

[tUn 1] Tuning (controller is autotuning the control loop)

[rP 1] Ramping (controller is ramping to a new set point)

Limited Warranty

Glas-Col warrants products of its manufacture to be free from defects in material and workmanship for one year and agrees to repair or replace without charge any products found defective upon examination at the factory. With proper care and operation, Glas-Col products will give long and efficient service. Chemical spillage, overheating, overloading, and general misuse will greatly reduce the service life. Glas-Col is not responsible for damage to apparatus due to improper installation or through attempts to operate the apparatus beyond its rated capacity, intentional or otherwise. Normally expendable parts are not covered by this warranty.

LIMITATION OF WARRANTIES

APART FROM SUCH WRITTEN STATEMENT OF WARRANTY, THERE ARE NO WARRANTIES, EXPRESSED, IMPLIED OR STATUTORY, WHICH EXTEND BEYOND THE DESCRIPTION OF THE PRODUCTS ON THE FACE HEREOF.

Glas-Col products are intended only for legal and legitimate purposes in commercial laboratory and industrial settings.

Glas-Col reserves the right to make product refinements without prior notice.

Spare Parts

Spare parts for Glas-Col shakers are generally available from the factory. Consult Glas-Col for part numbers and pricing.

Returns:

Call or fax Customer Service for a Return Goods Authorization (RGA) number before returning the product.

Reference the RGA number on the shipping box and on a written description of the problem.

A 15% restocking charge of the net price is changed for all standard products returned to stock.

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