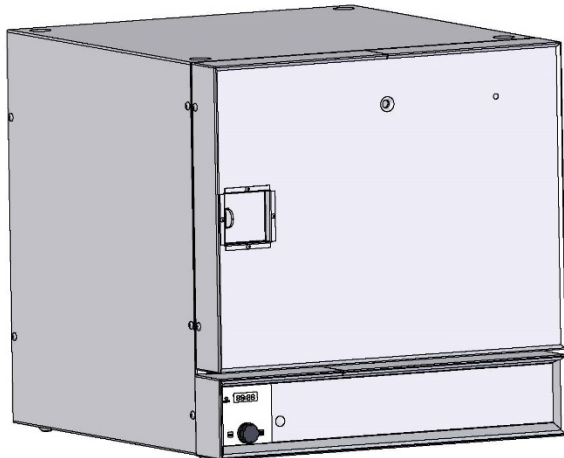




350 LB (159 KG) CAPACITY ELECTRODE STABILIZING OVEN



MODELS:
350-DT
350-DT-220

PARTS LIST & OPERATING INSTRUCTIONS

Website: www.gullco.com

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SAFETY INSTRUCTIONS

Although the Gullco Model 350 series of Electrode Stabilizing Ovens are manufactured for safe and dependable operation, it is impossible to anticipate those combinations of circumstances, which could result in an accident. An operator of this equipment is cautioned to always practice "**Safety First**" during each phase of setup, operation and maintenance.

Read and understand the whole operation manual before operating or performing service of this equipment. Become familiar with the ovens operation, applications and limitations. Keep the operation manual in a clean and readily available location.

A careless operator invites troubles, and failure to follow safety practices may cause serious injury or even death. Important safety precautions are given in the following:

Electrical Shock Prevention

- Do not use this equipment in damp or wet locations.
- Do not expose this equipment to rain.
- Never carry this equipment by the power cord or pull the power cord to disconnect from the receptacle.
- Keep the power cord from heat, oil and sharp edges.
- Inspect the power cord periodically and replace if damaged.
- Inspect the secureness of the power cord periodically and repair if loose.
- Disconnect the power cord when not in use.
- Disconnect the power cord **positively** to prevent electrical shock before repair and service of the equipment.

Bodily Injury Prevention

- Do not stack Model 350 Ovens higher than four ovens.
- Wear suitably rated thermal gloves, aprons, etc., when handling the oven or contents after the oven has been energized.

IMPORTANT! BEFORE CONNECTION: ENSURE THAT SUPPLY VOLTAGE MATCHES THAT SHOWN ON THE PRODUCT LABEL/RATING PLATE

NOTE Other important safety instructions are given elsewhere in this manual. Make sure that you read, understand and follow all such instructions.

ALL THE SAFE PRACTICES AND PRECAUTIONS MAY NOT BE GIVEN IN WRITING. SOME ARE BASED ON COMMON SENSE, BUT OTHERS MAY REQUIRE TECHNICAL BACKGROUND TO EXPLAIN.

SPECIFICATIONS

MODEL	350-DT	350-DT-220
VOLTAGE	115 VAC, 1 ϕ , 50/60 HZ	230 VAC, 1 ϕ , 50/60 HZ
LINE CORD	NORTH AMERICAN	EUROPEAN
AC PLUG	NORTH AMERICAN	NONE
WATTAGE	1500 WATTS	
CAPACITY	350 LB / 159 KG	
APPROXIMATE TEMPERATURE RANGE	100 - 550°F 38 - 288°C	
WEIGHT	105 LB / 47.6 KG	
EXTERNAL DIMENSIONS	H-22", W-22", D-24½" H-559mm, W-559mm, D-622mm	
INTERNAL DIMENSIONS	H-14", W-16", D-19" H-355mm, W-406mm, D-482mm	

GENERAL DESCRIPTION

The Model 350 series of ovens are 350 lb (159 kg) capacity electrode stabilizing ovens used to maintain welding electrodes in their dry state or to dry electrodes which have absorbed moisture. The Model 350 is operated on single phase power with heat being supplied by a single element. The ovens are normally located in a central storage area. They are complete with recessed controls, removable shelves, full insulation pilot light and a heating system incorporating a low watt density element. Temperature is thermostatically controlled. Nesting feet and sockets ensure safe, easy stacking of up to four ovens.

Ensure adequate free space is provided around the ovens for safe loading and unloading of the electrodes. Users should exercise caution when loading and unloading the oven. Certain parts of the oven and the electrodes may reach temperatures exceeding 550° F (288°C). All exposed body parts must be protected against accidental contact with hot materials. Safety glasses, gloves, overalls, and protective footwear must be worn when using the oven. Hot electrodes must be unloaded into a suitable container capable of withstanding the heat and of containing the load safely.

To minimize the risk of electrical shock the Model 350 range of ovens should not be exposed to rain or placed in a wet location. Liquids should not be placed in the oven. The oven should be connected to a suitable, fused power supply using a recognised connector. The oven must be properly earth grounded. To minimise the risk of fire do not place food, beverages or other combustible items in the oven.

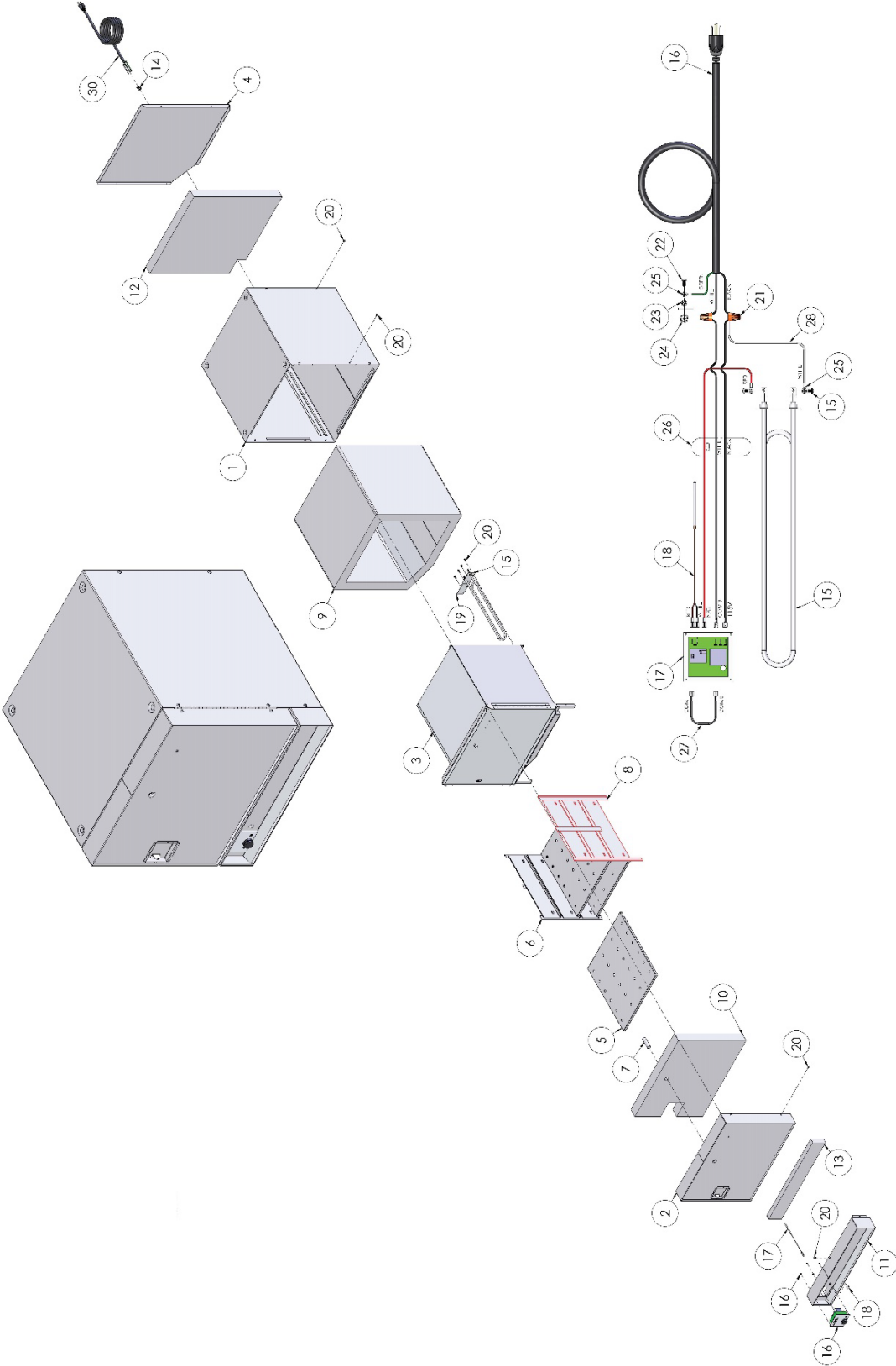
USING THE OVEN

The oven is loaded and unloaded via the front door. Avoid contact with hot surfaces during this operating. The load should be distributed securely and evenly within the oven to ensure even heating. The shelves may be removed to accommodate larger loads if required.

MODEL 350-DT OVEN PARTS BREAKDOWN

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
	GOV-350 OVEN SHELL	GOV-350 OVEN SHELL (INCLUDES ITEMS 1-11)	
1	GOV-35-001	OVEN COVER	1
2	GOV-35-002	OVEN DOOR ASSEMBLY	1
3	GOV-35-005	INNER SHELL ASSEMBLY	1
4	GOV-35-013	BACK COVER	1
5	GOV-35-045	INNER PAN	3
6	GOV-35-057	LEFT SIDE RACK	1
7	GOV-35-056	SPACER	1
8	GOV-35-058	RIGHT SIDE RACK	1
9	GOV-35-060	INNER INSULATION	1
10	GOV-35-065	DOOR INSULATION	1
11	GOV-350-071-DT	DIGITAL CONTROL PANEL WELDMENT	1
12	GOV-35-063	REAR PANEL INSULATION	1
13	GOV-35-068	CONTROL PANEL INSULATION	1
14	GK-148-005	STRAIN RELIEF, HEYCO #6P3-4	1
15	1015	115V HEATER ELEMENT	1
16	GOV-1900	THERMOSTAT SERIES 1900	1
		#4-40UNC LOCKING HEX NUT (INCLUDED IN PACKAGE)	4
17	GOV-1901	TYPE J PROBE	1
18	GK-155-003	PLASTIC PLUG BUTTON 1/2" BLK	1
19	GOV-35-074	ELEMENT COVER PLATE	1
20	GK-112-140	#10-32x1/2 ROUND TRUSS HEAD STS	19
21	GK-151-008	WIRE NUT	2
22	GK-112-065	10-32 x 3/8" ROUND HEAD SCREW	1
23	GK-129-012	#10 STAR WASHER	1
24	GK-135-057	10-32UNC STAR LOCK NUT	1
25	GK-156-008	#10 RING TERMINAL	2
26	GOV-350-003-DT	THERMOSTAT WIRING HARNESS	1
27	GOV-350-002-DT	THERMOSTAT JUMPER WIRE	1
28	RM-111-118	#14 AWG, WHITE	10'
30	350-LC	115V NORTH AMERICAN POWER CORD	1

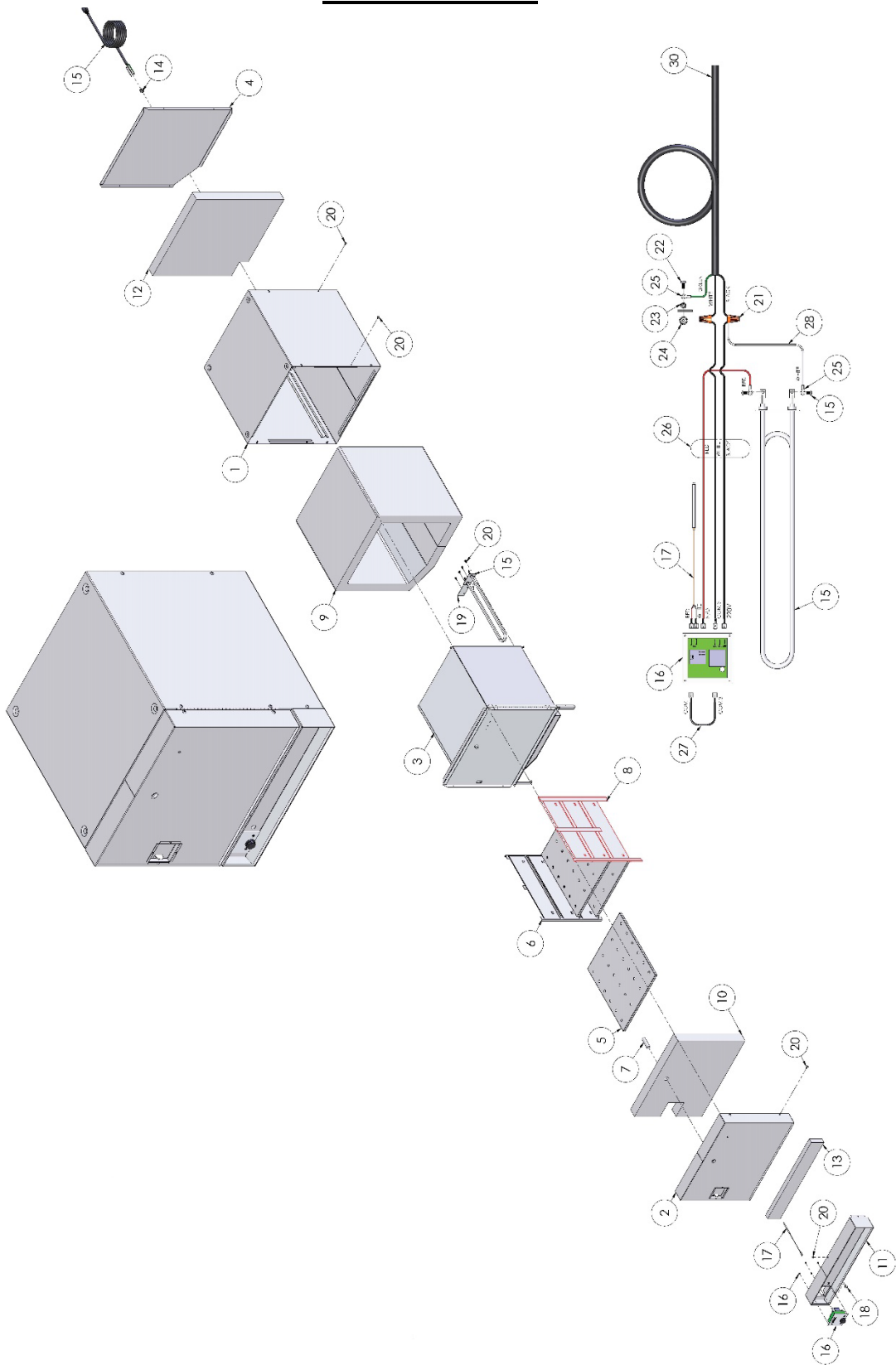
MODEL 350-DT OVEN PARTS BREAKDOWN & SCHEMATIC



MODEL 350-DT-220 OVEN PARTS BREAKDOWN

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
	GOV-350-220 OVEN SHELL	GOV-350 OVEN SHELL (INCLUDES ITEMS 1-11)	
1	GOV-35-001	OVEN COVER	1
2	GOV-35-002	OVEN DOOR ASSEMBLY	1
3	GOV-35-005	INNER SHELL ASSEMBLY	1
4	GOV-35-013	BACK COVER	1
5	GOV-35-045	INNER PAN	3
6	GOV-35-057	LEFT SIDE RACK	1
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11	GOV-350-071-DT	DIGITAL CONTROL PANEL WELDMENT	1
12	GOV-35-063	REAR PANEL INSULATION	1
13	GOV-35-068	CONTROL PANEL INSULATION	1
14	GK-148-005	STRAIN RELIEF, HEYCO #6P3-4	1
15	1020	220V HEATER ELEMENT	1
16	GOV-1900	THERMOSTAT SERIES 1900	1
		#4-40UNC LOCKING HEX NUT (INCLUDED IN PACKAGE)	4
17	GOV-1901	TYPE J PROBE	1
18	GK-155-003	PLASTIC PLUG BUTTON 1/2' BLK	1
19	GOV-35-074	ELEMENT COVER PLATE	1
20	GK-112-140	#10-32x1/2 ROUND TRUSS HEAD STS	19
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27	GOV-350-002-DT	THERMOSTAT JUMPER WIRE	1
28	RM-111-118	#14 AWG, WHITE	10'
30	350-LC-220	220V EUROPEAN LINE CORD	1

MODEL 350-DT-220 OVEN PARTS BREAKDOWN & SCHEMATIC



REVISIONS LIST

Jan, 2024

Overall

Manual release.

ADDITIONAL NOTES

Specifications and products are subject to change without notice.
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LINEAR or RADIAL
HIGH DEPOSIT RATE
QUICK SETUP TIME

KAT® OSCILLATOR

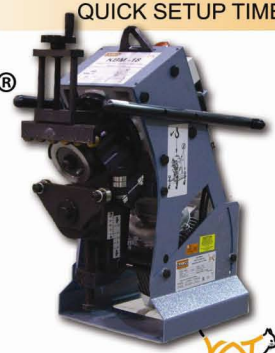
- Motorized weld center line adjustment
- Motorized stroke width
- Oscillation speed control
- Store up to 10 welding programs



PORTABLE PLATE EDGE
BEVELLING MACHINE
QUICK SETUP TIME

KBM®

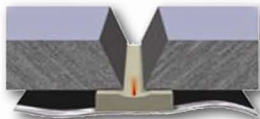
- Produce clean bevels with no thermal distortion
- Bevels angles 22° to 55° (other angles available)
- Hydraulic and Adjustable undercarriages available
- Bevels Mild Steel, Stainless Steel, and Aluminium
- Reduce cost and save time by minimising defects and poor fit up



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Lloyd's Register



PORTABLE AND COMPACT
INCREASE EFFICIENCY
MORE ARC ON TIME

MOGGY® FILLET WELD CARRIAGE

- Single or Dual Torch Models
- Magnet or Non Magnetic Base
- Continuous or Stitch Welding Models
- Fillet, Lap, Butt and Dual Torch Welding



Operating Manual

Model 1900 General
Purpose Programmable
Time/Temperature
Controller

INTRODUCTION

The Series 1900 General Purpose Time/Temperature Controller incorporates three separate user selectable operating Modes; a Time/Temperature mode, a Temperature control mode and a Timer mode. The functionality and programmability of the controller is determined by the specific operating mode selected. The operating mode is changed from within Setup (Refer to the Controller Setup Programming section below).

In Time/Temperature Mode the user can preprogram the run temperature (SP1) and the run time of a heating cycle. At the conclusion of this timed cycle the controller can be programmed to hold the process indefinitely at a second set point temperature (SP2) or to turn off the heat completely. Pressing the START/STOP button starts the run timer and causes the controller to begin heating to the SP1 temperature. The controller will maintain this temperature until the timer reaches 0 then, depending on user programming, the oven will shut off or the set point temperature will change to the SP2 set point.

The Temperature Control Mode operates as a normal single loop temperature controller. In this mode the process will be maintained at the user programmed temperature set point continuously while power is applied to the controller. In the Temperature Control Mode the START/STOP button toggles the controller display and output On & Off.

In Timer Mode the controller functions as a preset countdown timer. When a timing cycle is initiated by pressing the START/STOP button the output relay will be energized. At the end of the timing cycle the relay will de-energize and the buzzer will sound.

Refer to the Controller Operation section for more details on these operating modes.

CONTROLLER OPERATION

INITIAL POWER UP

When power is applied to the controller the revision level of the installed firmware is displayed for a few seconds while diagnostic tests are performed. If the tests are completed successfully the controller will automatically return to the last used operating mode.

If a problem is detected the controller will be disabled and an appropriate error code displayed (Refer to the Troubleshooting section below). After correcting the problem power to the controller must be cycled off and back on to clear the error.

VIEWING/CHANGING SET POINTS

Pressing SET at any time accesses the set point edit mode. In the edit mode the currently active set points can be viewed and, if desired, changed by rotating the set point knob. The

maximum and minimum values allowed for any set point is determined by the respective Max/Min values set in Setup. Refer to the Controller Setup Programming section below.

A Time set point is changed in two steps, first the two right hand digits (Secs or Mins) then the two left hand digits (Mins or Hrs). This allows large time changes to be made more quickly. The digits currently being changed blink on and off. The SET button saves the new value and shifts programming to the next two digits.

A Temperature set point is changed one digit at a time beginning with the right most digit then the center digit and finally the left most digit. This allows large set point changes to be made much more quickly. Pressing the SET button shifts programming to the next digit to the left. The digit currently being changed blinks on and off.

TIME/TEMPERATURE (OP1)

In Time/Temperature mode the normal (idle) display is the Run Time SP. If the Preheat function is enabled the heat output will be energized immediately when power applied to the controller. The output will remain on and the display will flash "PrHt" until the SP2 set point has been achieved then the Run Time SP is displayed.

To initiate a Timed temperature cycle press START/STOP. The controller will immediately begin heating the oven to the SP1 set point and the timer will begin counting down. The time remaining in the cycle will be continuously displayed while the timer is running. Actual oven temperature can be momentarily displayed by pressing the set point knob.

When the timer reaches 0 the beeper will sound if enabled. If the Hold function is enabled the controller will begin controlling to the SP2 set point and "HoLd" will be displayed. Pressing START/STOP will reset the timer returning the display to the normal idle state (Time SP displayed) ready for another cycle. If Preheat is enabled the controller will continue to maintain the oven temperature at the SP2 set point until a new cycle is initiated. If Preheat is disabled the output will be de-energized until another cycle is initiated.

If the Hold function is disabled the controller output will immediately de-energize when the Timer reaches 0 and "End" will be displayed. Pressing START/STOP will reset the timer returning the display to the normal idle state (Time SP displayed) ready for another cycle.

The Temperature and Time points can all be changed at any time. See Viewing/Changing Set Points section above. Temperature set point changes are always retained in memory and become the default temperature set points whenever the controller is powered on. Time set point changes made while the controller is idling (timer not running) will be also be saved and become the default time set point when the controller is powered on. *However, time changes made while the timer is running apply only to the current timing cycle and are NOT saved.*

The Hold and Preheat functions are related in that the SP2 set point applies to both the Hold and Preheat functions. Also, in order for the Preheat function to be on the Hold function must also be turned on. If the Hold function is turned off then the Preheat will automatically be turned off as well. The Hold function can be turned off in Setup or on the fly by reducing the Hold set point until OFF is displayed.

If power is interrupted while the timer is running the heating cycle will be aborted and “PL” will be displayed when power is restored. Press START/STOP to clear the error message.

TIMER MODE (OP2)

In Timer mode the normal (idle) display is the Time set point. At power up the previously used Timer set point is displayed and the output relay remains de-energized.

The Time set point can only be changed while the Timer is idle (not running). See Viewing/Changing Set Points section above. When the set point is changed it is retained in memory and becomes the default set point the next time the controller is powered on.

Press START/STOP to start the Timer countdown. The output relay will energize and the display will show the time remaining in the cycle. Pressing START/STOP while the timer is running immediately aborts the cycle, de-energizes the relay and resets the Timer. If enabled, the beeper will sound.

The Time remaining can be changed on the fly while the Timer is running by pressing SET. See Viewing/Changing Set Points section above. *Note that changes to the time remaining will only apply to the current time cycle and will NOT be retained for subsequent cycles.*

If power is interrupted while the Timer is running the time cycle will be aborted and “PL” will be displayed when power is restored. Press START/STOP to clear the error message.

TEMPERATURE MODE (OP3)

When power is first applied in Temperature mode the display and output will be Off. Pressing the START/STOP button will turn on the display and the controller will immediately begin controlling to the set point temperature. When set point is achieved the output relay will cycle on and off as required to maintain the process at the set point temperature.

The set point can be changed at any time. See Viewing/Changing Set Points section above. When a set point change is made the new set point is retained in memory and becomes the new default set point the next time the controller is powered on.

The set point temperature is displayed by default. Pressing the knob causes the actual temperature to be displayed. By changing the display mode in setup the actual temperature can be made to be the normal display with the set point being displayed when the knob is pressed.

AUDIBLE ALARM

The audible alarm action is determined by the Alarm Mode setting in Setup. In auto mode the buzzer automatically stops after several 1 second bursts. In continuous mode the buzzer will continue to emit 1 second bursts until manually silenced by pressing a button. When turned off the buzzer is disabled.

SELECTING SENSOR TYPE

The user selectable sensor function is currently disabled. The factory programmed sensor type is displayed when the “SnSr” menu is selected in setup. Contact the factory if a different sensor input is required.

CONTROLLER SETUP PROGRAMMING

The Controller Setup Programming mode can only be accessed while the controller is idling (Timer not running) and is accessed by entering the following key press sequence.

SET, START, KNOB, KNOB, SET

Upon entering Setup prompts indicating the parameter to be programmed are displayed for 3 seconds followed by the current value of that parameter. *Note that only the parameters applicable to the selected Operating Mode will be displayed.*

Rotating the set point knob changes the parameter values. Pressing SET saves the displayed value and advance to the next prompt in the menu. When all parameters have been displayed the controller will automatically exit setup mode or after 10 seconds of inactivity the controller will automatically exit setup mode.

Table 1 – Setup Menu

Parameter	Prompt	Value Range & Description	Default
Operating Mode ¹	OP	OP 1=Time/Temp; OP2=Timer only; OP3=Temp only	OP3
Temperature Units ²	F C	F = Fahrenheit; C = Celsius	F
Max. SP Limit	SPHi	100 to 700F or 40 to 370C	550F
Min. SP Limit	SPLo	50 to 500F	100F
Hold	HoLd	on or off	on
Preheat	PrHt	on or off	on
Hysteresis	HYS	1 to 100F or .5 to 38C	5F
Sensor Offset	OFFS	±0 to 100F or ±0 to 38C	0
Display ³	dl SP	SP=Temp Set Point or ACT=Actual Temperature	SP
Sensor ⁴	SenSr	tC 1=JTC; tC 2=KTC	tC1
Time Range	TrAnG	Lo = Mins/Secs Hi = Hrs/Mins	Lo
Max. Time SP	tHi	0:0 to 99:55	20:00
Beeper	BEEP	AULo=5 beeps; conL=press button to stop; off=none	AULo

1. Only menu items applicable to the specific operating mode selected will be displayed.
2. Changing Temperature Units automatically resets all parameters to their factory default values.
3. Only available in Temperature only mode (OP3).
4. Sensor menu is read only. Sensor type is not currently an operator selectable parameter.

TROUBLEHOOTING

SENSOR FAULT (Error message “Prb”)

The sensor input is continuously monitored for a Thermocouple break or an open/shorted PRTD. If a sensor fault is detected the current cycle is aborted, the output relay de-energizes and the “Prb” error message is displayed. Check for a faulty sensor, loose sensor connection or open/shorted sensor leads. After the fault has been corrected power to the controller must be cycled off and back on in order to clear the error.

MEMORY ERROR (Error message “Err”)

User programmed parameters are stored in non-volatile memory for a minimum of 10 years. Should this memory become corrupted the controller will be disabled and “Err” will be displayed. Restoring the controller to the factory default condition should correct the problem. Refer to “Restoring Factory Defaults” below.

RESTORING FACTORY DEFAULTS

It is sometimes helpful while troubleshooting to restore the controller to a known operating condition. All parameters can be restored to their factory default values by holding the SET and START/STOP buttons while applying power to the controller. *Note that all user programmed parameter values will be lost when factory defaults are restored.*

SPECIFICATIONS

Electrical Specifications

Operating Voltage: 120/240VAC \pm 10%, 50/60Hz
Output Type: SPST relay is standard; SPDT relay is optional. Refer to UL ratings below.

<u>120/240VAC</u>	<u>N.O.</u>	<u>N.C.</u>	<u>Cycles</u>	<u>Amb.</u>
Resistive/GP	30 Amps	15 Amps	100,000	40°C
Resistive/GP	20 Amps	10 Amps	100,000	70°C
Pilot Duty	1 Amp	-	100,000	70°C

Control Mode: On-Off with adjustable Hysteresis (factory default 4°F)
Temp Sensor: Thermocouple or PRTD¹
Sensor Input Filter: Software noise filter with 1.9 second time constant
Display Type: 4 digit, 7 segment Red LED
Display Range: Temperature 32 to 700°F or 0 to 371°C
Time 0 to 99:59 Hrs/Mins or Mins/Secs
Display Resolution: Temperature - 1°F or 1°C
Time - 1 minute or 1 Second
Set Point Ranges: 50 to 700°F (10 to 240°C) with adjustable min/max limits²
Annunciators: LED Heat On indicator and 85db 2048Hz beeper
Operator Interface: Rotary encoder with integral PB switch and separate SET & START/STOP PB switches.

Environmental Specifications

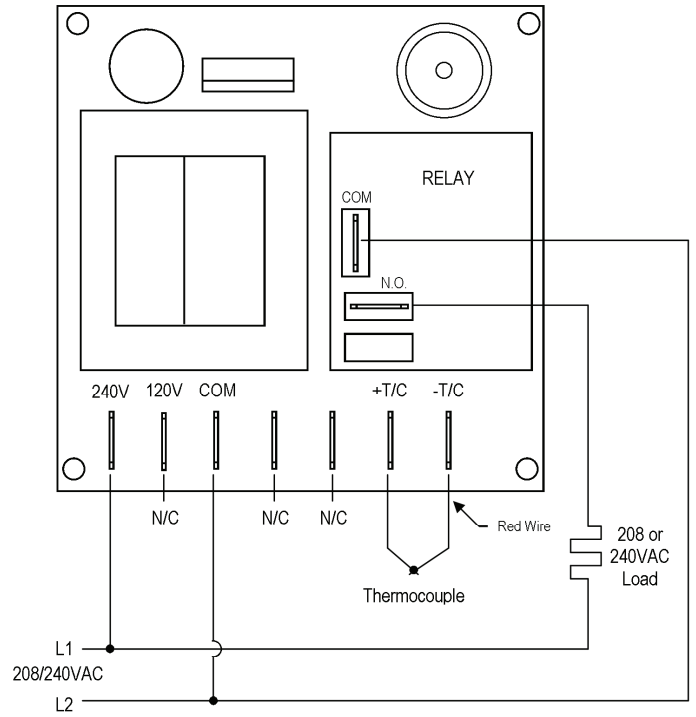
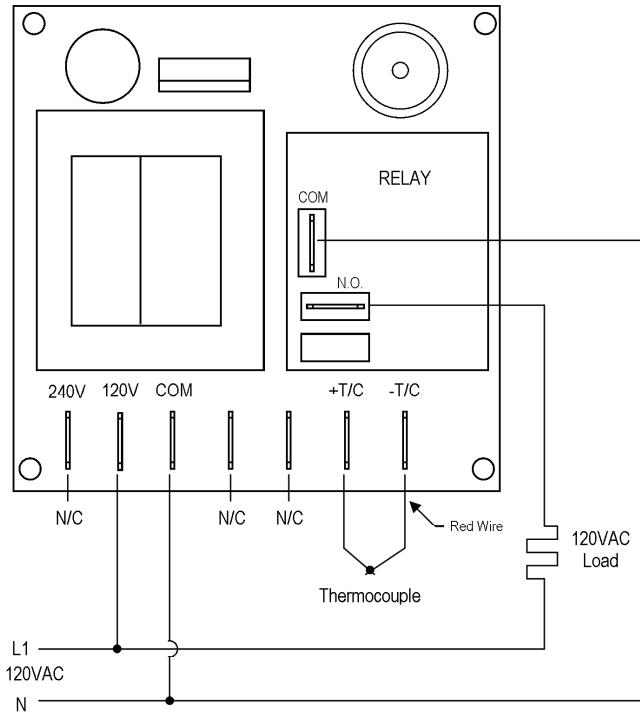
Op Amb Temp: 0 to 70°C (32 to 158°F)
Humidity: 0 to 95% RH, non-condensing

Mechanical Specifications

Notes

1. Type of sensor is selectable in Setup. Sensor not required for Timer only operation.
2. Factory default 100°F min and 500°F max.

WIRING DIAGRAMS





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QUICK SETUP TIME

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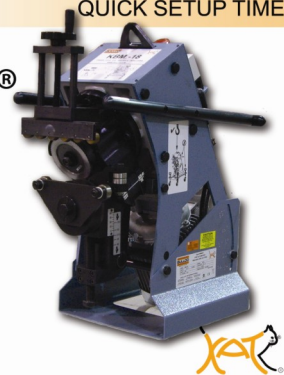
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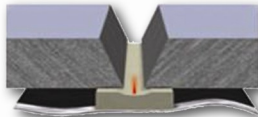
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