

Operating Manual

Model 75-850-BV & 75-852-BV Hydrogen Separator with Manual Bypass Valve

Model 75-850-BV: 120 V, 50/60 Hz
Model 75-852-BV: 230 V, 50/60 Hz

September 2020
Rev. 7

**READ INSTRUCTIONS
BEFORE OPERATING**



GOW-MAC Model 75-850-BV or 75-852-BV Hydrogen Separator

1. Connections

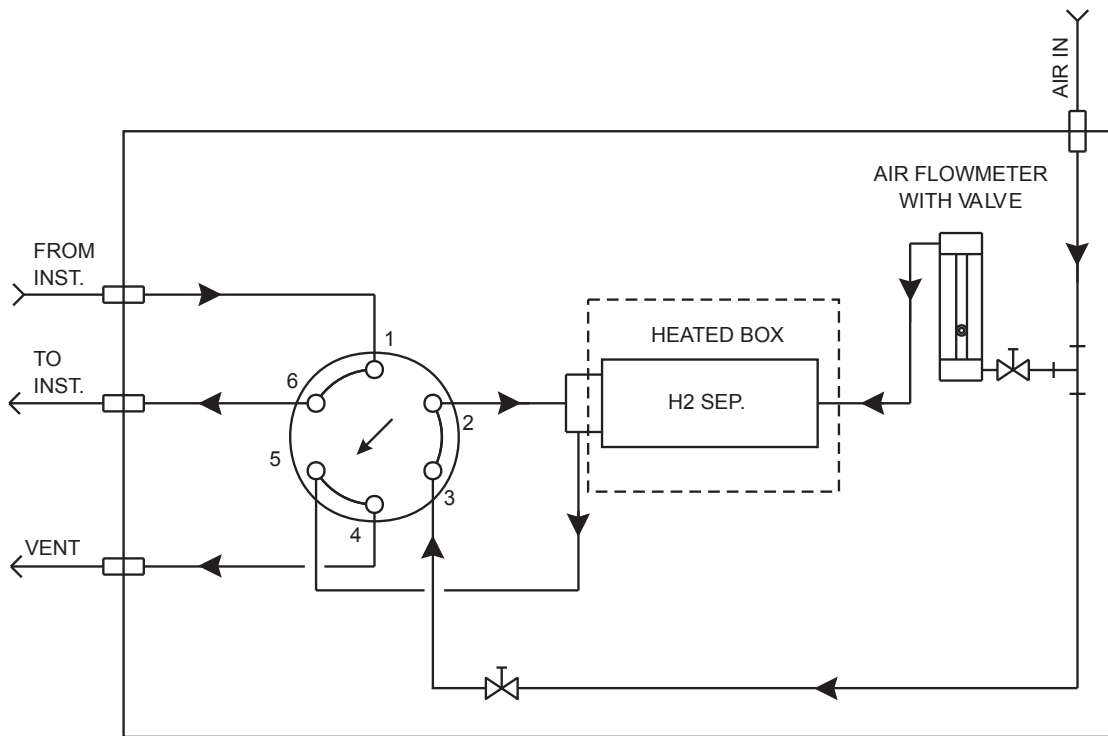
1. Connect AIR CYLINDER to the back of the Hydrogen Separator at AIR fitting.
2. Using the ROTAMETER located on the front panel of the Separator, set the AIR FLOW to the optimum setting according to the chromatogram located at the back of this manual. The flow of air can range between 100 - 300 ml/min.
3. Using the 1/16" VCR tubing that is supplied, connect the Separator to the Series 590 DID GC as follows:



THE INLET/OUTLET FITTINGS ARE VCR TYPE AND WASHERS MUST BE USED. CHECK THE CARRIER FLOW RATE TO BE SURE THAT NOTHING HAS CHANGED.

- a. Connect one end of the supplied tubing to "FROM INST" fitting located on the side of the Model 75-850-BV or 75-852-BV and the other end of the tubing to "TO SEP" fitting located on the rear of the GC.
- b. Connect one end of another piece of the supplied tubing to "TO INST" fitting located on the side of the Model 75-850-BV or 75-852-BV and the other end of the tubing to "FROM SEP" fitting located on the rear of the GC.
- c. Turn BYPASS VALVE to SERIES/RUN position.

Separator/Series 590 GC Connections



Flow Diagram

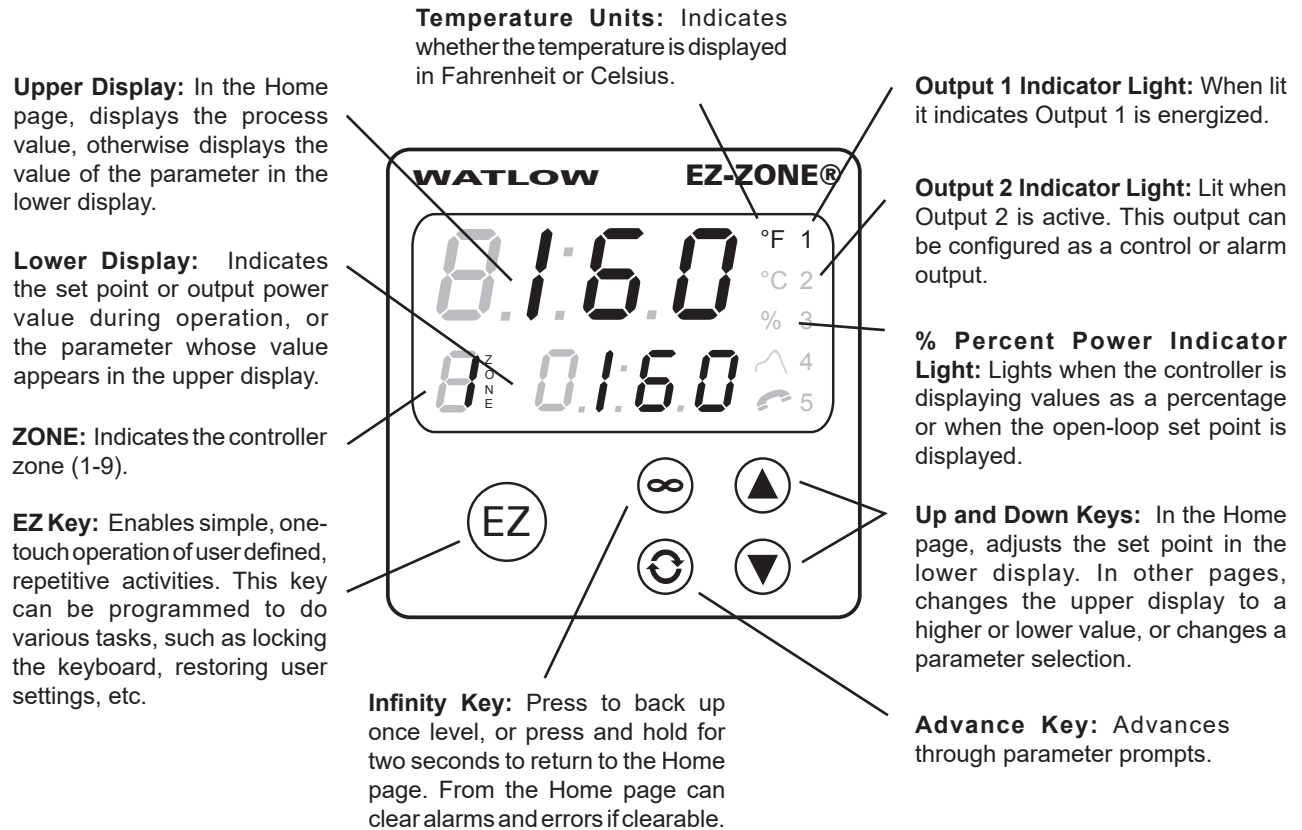
2. Settings

1. At this point, turn the H₂ Separator ON and set the operating temperature according to the optimum temperature setting on the chromatogram located at the back of this manual. The operating range for the temperature is between 85° - 450°C.
 - a. Press either UP-arrow or DOWN-arrow key until the desired temperature is displayed. Refer to the chromatogram located in the back of this manual for correct temperature. A few seconds after the temperature is set, the controller will start to adjust the temperature automatically.
 - b. Once the temperature is reached, the H₂ separator is ready for use. Inject H₂ samples just like they were any normal GC injection, following the instruments' normal operating procedures.
 - c. If the hydrogen starts to prevent the analysis from being performed, lower the air flow to see if the quality of the analysis improves. If it does not, try varying the temperature, in approximately 50°C increments, higher or lower until there is a reduction in the hydrogen breaking through. If the removal of the hydrogen is still insufficient enough to allow for a qualitative and quantitative analysis, recondition the Separator as directed in instructions found later in this manual entitled, "Hydrogen Breakthrough."

3. Controls

A. Power Switch/Circuit Breaker: Turns AC power ON/OFF.

B. Temperature Controller:



C. Bypass Valve: Allows the user to connect the Separator to the Series 590 DID GC or bypass the Separator.

4. Responding to a Displayed Message/Error Code

An active message will cause the display to toggle between the normal settings and the active message in the upper display and [ATTN] in the lower display.

Your response will depend on the message and the controller settings. Some messages, such as Ramping and Tuning, indicate that a process is underway. If the message was generated by a latched alarm or limit condition, the message can be cleared when the condition no longer exists. If an alarm has silencing enabled, it can be silenced.

Push the Advance Key to display $[.9NR]$ in the upper display and the message source (such as $[L.HI]$) in the lower display.

Use the Up and Down keys to scroll through possible responses, such as Clear $[CLR]$ or Silence $[5.L]$. Then push the Advance or Infinity key to execute the action.

ER. 1 - Error Input 1: The sensor input generated a value lower than the allowable signal range. Enter a valid input.

100 - Device Error: Controller displays internal malfunction message at Power Up.

i. Set Point

a. To set the set point: turn the unit "on" and then push the Up or Down arrow to adjust to the desired operating temperature.

5. Hydrogen Breakthrough

The H₂ Separator is equipped with a palladium/silver alloy membrane. Its function is to quantitatively remove the hydrogen balance gas from a hydrogen sample leaving only the impurities in the helium carrier gas stream. After using the system for a period of time with hydrogen, the appearance of a hydrogen peak will be seen. This is caused by the buildup of carbonaceous deposits inside the palladium tube. By allowing air to pass through the tube at operating temperature it is possible to remove this buildup and restore the Separator to its original state.

1. Turn the BYPASS VALVE to "Bypass/Recondition" position.
2. Set the AIR flow rate to the optimum flow setting as directed by the chromatogram located at the back of this manual. Set temperature to 450 °C for 1 hour. This burns off any deposits on the palladium/silver alloy membrane.
3. Turn BYPASS VALVE to the "Series/Run" position to connect the Separator to the GC. Purge for 15 minutes.



NOTE

IT IS IMPORTANT THAT THE AIR SUPPLY USED FOR THIS INSTRUMENT BE AT LEAST ZERO GRADE (CONTAINING < 1PPM OF HYDROCARBONS). IMPURE AIR CAN HELP TO CAUSE THE SEPARATOR TO NEED RECONDITIONING MORE FREQUENTLY. ALSO HALOGENS, ORGANOMETALS, SULFUR COMPOUNDS, DOPING GASES AND OTHER HEAVY METALS CAN CAUSE PLUGGING OF THE SEPARATOR TUBE AND REQUIRE TUBE REPLACEMENT.

6. General Specifications for the Temperature Controller

Part Number	124-261
Control Mode:	- Microprocessor-based - Single input, dual output - Ramp to set point: 0 to 550° - Heat and cool auto-tune - PID with automatic tuning
Sensor Input Type:	Platinum RTD, 100 ohms
Supply Voltage:	85 - 264 VAC, 50/60 Hz (75-850-BV/75-852-BV)
Mechanical Relay Life Span:	100,000 cycles
Sensor Input Type:	Platinum RTD, 100 ohms
Ambient Temperature Range:	Operating: - 18 to 65 °C Storage: - 40 to 85 °C

7. Separator Specifications

Operating temperature:	300 °C
Max. Operating Pressure:	250 psig
Operating Carrier Gas Flow Rate:	30-50 mL/min.
Standard Fittings:	1/8" VCR
Weight (net):	15 lbs.
Dimensions:	15-1/2"D x 6-1/2"W x 12"H

8. Waste Disposal

This procedure is for GOW-MAC Mini Purifier Part No. 180-542 (Helium) and 180-542-AR (Argon).

If the purifier is used, then the getter material inside the purifier is already in a non-reactive state, (i.e. will not react with air).

If the material is still in a reactive state (i.e. the purifier is not completely "used up"), it still will not sustain combustion in air except at temperatures over 350 °C, and with a continued access to air.

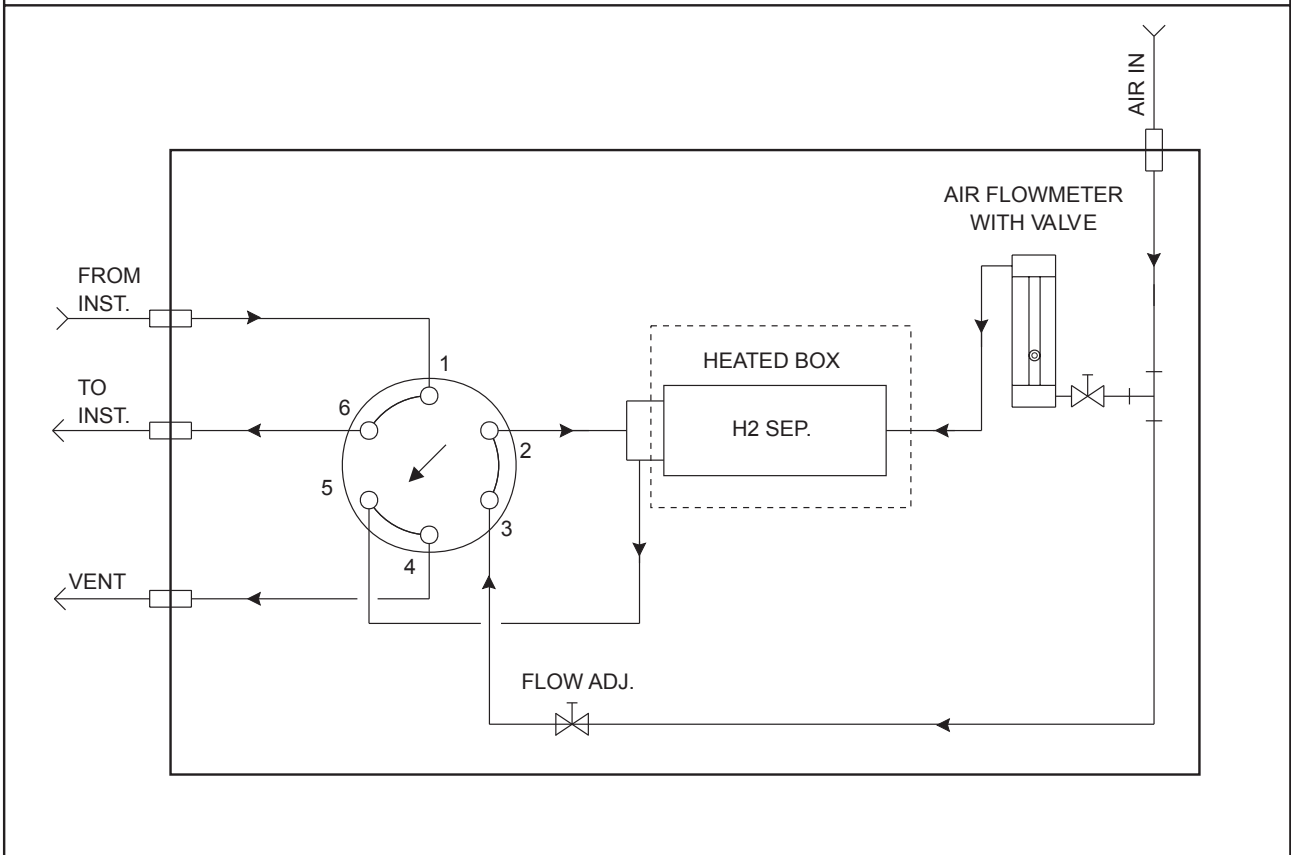
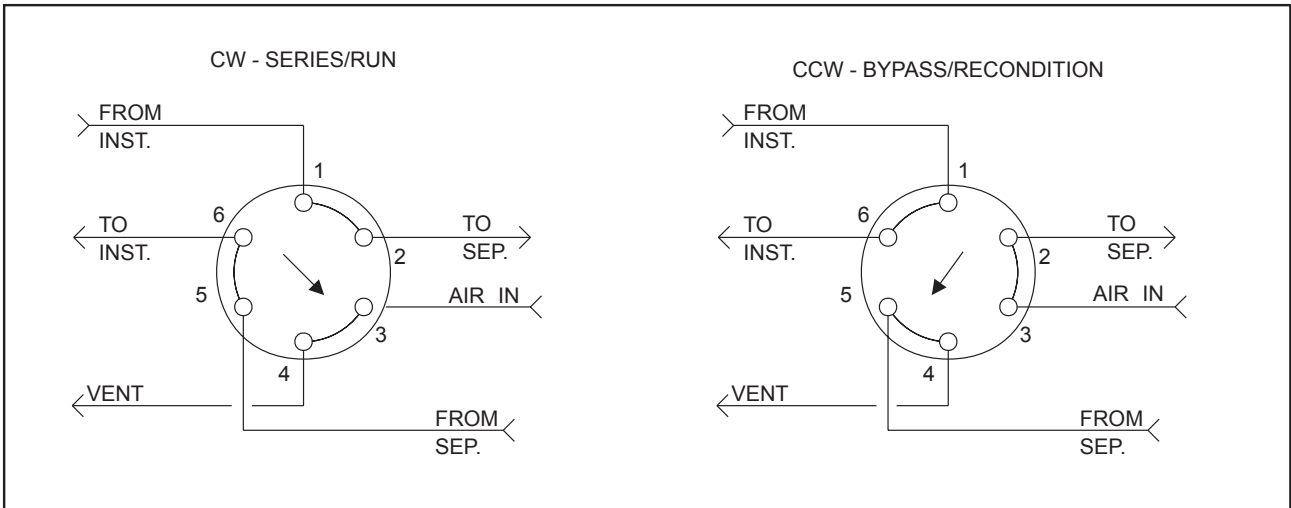
The operator should place a VCR cap over the inlet/outlet fittings for sufficient precaution before disposal. It is then acceptable to deposit in an approved landfill, in accordance with local, state and/or federal regulations. When disposed of in this manner, the waste poses no known environmental problems.


9. Replacement Parts

<u>Description</u>	<u>Part No.</u>
Fuse, 10 A (115 V).....	121-162
Fuse, 5 A (230 V)	121-177
Fan (115 V)	124-156
Fan (230 V).....	124-162
Sensor.....	124-175
Heater (115 V).....	124-197
Heater (230 V).....	124-200
Temperature Controller	124-261
Power Cord, 3 conductor shielded	127-407
Receptacle, power switch w/ line filter (115 V).....	129-152-10A
Flowmeter	180-138
Palladium Tube, Replacement	180-544-VCR-3
Valve, 6-port.....	181-643

Contact GOW-MAC for replacement parts:

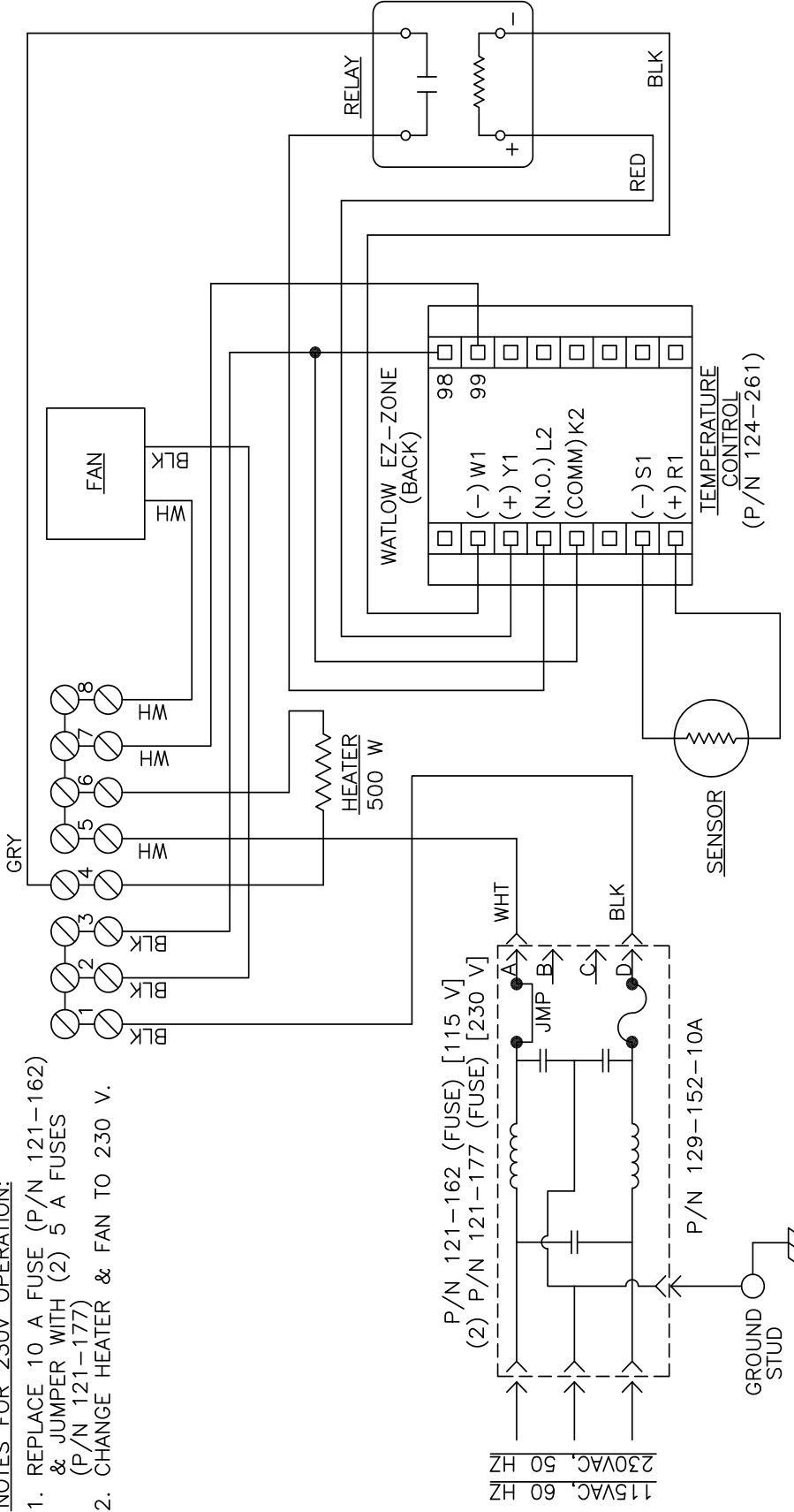
GOW-MAC Instrument Co.
277 Brodhead Road
Bethlehem, PA 18017 U.S.A.
Tel: (610) 954-9000
Fax: (610) 954-0599
E-mail: sales@gow-mac.com
URL: www.gow-mac.com



FILE: A18845.DWG					DWN. KH	NAME FLOW DIAGRAM 75-850-BV	
					DATE 8/25/99		
					CHK.	MATERIAL	
					SCALE N.T.S.	FINISH	
					TOL. UNLESS NOTED .X ± .04 .XX ± .02 .XXX ± .010 HOLES ± .003 ANGULAR ± 1°	DO NOT SCALE DWG.	
	1	10/31/07	ADDED METERING VALVE	KH		REV. NO.	 GOW-MAC [®] INSTRUMENT CO. <small>277 BRODHEAD ROAD BETHLEHEM, PA 18017-8600</small>
	NO	DATE	CHANGE	BY	ECO	1	

NOTES FOR 230V OPERATION:

1. REPLACE 10 A FUSE (P/N 121-162) & JUMPER WITH (2) 5 A FUSES (P/N 121-177)
2. CHANGE HEATER & FAN TO 230 V.



7	11/28/18	TERMINAL BLOCKS UPDATED FOR EURO TYPE. P/N 159-306 ADDED.	CRC	DWN.	CH	NAME
6	3/26/13	ADDED LINE FILTER RECEPTACLE (129-152-10A) UPDATED NOTE FOR 230 V OPERATION.	CRC	DATE	2/19/91	WIRING SCHEMATIC
5	5/2/11	UPDATED WIRING & ADDED RECEPTACLE.	SML	CHK.		75-850/852 & 159-306
4	5/5/10	UPDATED FOR NEW TEMP. CONTROLLER (P/N 124-263) [MS 124-217]	SML	SCALE	N.T.S.	MATERIAL
3	6/30/98	TEMPERATURE CONTROLLER CHANGED.	SML	452	452	FINISH
2	9/12/97	TEMPERATURE CONTROLLER CHANGED.	SML			DO NOT SCALE DWG.
1	6/7/94	TEMP. CONT. & RELAY CHANGED	KH			REV. NO. 7
NO	DATE	CHANGE	BY	ECO		

FILE: A16551R7.DWG

GOW-MAC
INSTRUMENT CO.
277 BRODHEAD ROAD BETHLEHEM, PA 18017-8600

A-16551

Warranty

ALL INSTRUMENTS SOLD BY GOW-MAC[®] INSTRUMENT CO. ARE WARRANTED FOR A PERIOD OF ONE YEAR AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP. THE TERMS OF THIS WARRANTY ARE AS FOLLOWS:

1. The warranty period begins with the shipping date of the equipment to the original purchaser.
2. Certain parts such as batteries, fused, glass accessories, septa, columns, etc., are expendable in normal use, and their service life is unpredictable. Such items are not covered by this warranty.
3. Filaments of thermal conductivity detectors are not covered by this warranty.
4. All requests for service or repair under this warranty must be received within the warranty period by GOW-MAC[®] or its authorized representative. All repairs are made at GOW-MAC plants or at the office of authorized representatives.
5. All repairs, adjustments, and other service under this warranty shall be performed free of charge to the purchaser. However, warranty service and repairs shall be limited to equipment malfunctions which, in the opinion of GOW-MAC[®], are due or traceable to defects in original materials or workmanship. Instrument malfunctions caused by abuse or neglect of the equipment are expressly not covered by this warranty.
6. Instrument parts which have been repaired or replaced during the warranty period are themselves warranted only for the remaining unexpired portion of the original one year warranty.
7. Repairs, adjustments, and service performed after expiration of the one year warranty period shall be charged to the purchaser at the then current prices for parts, labor, and transportation.
8. This warranty attaches to the equipment itself and is not limited to the original purchaser. Unexpired portions of the warranty are thus transferable to subsequent owners.
9. GOW-MAC[®] expressly disclaims any liability to users of its products for consequential damages of any kind arising out of or connected with the use of its products.
10. Except as stated in Sections 1 through 8 above, GOW-MAC[®] makes no warranty, expressed or implied (either in fact or by operation of law), statutory or otherwise; and, except as stated in Sections 1 through 8 above, GOW-MAC[®] shall have no liability under any warranty, expressed or implied (either in fact or by operation of law), statutory or otherwise.
11. Statements made by any person, including representatives of GOW-MAC[®] which are inconsistent or in conflict with the terms of this warranty shall not be binding upon GOW-MAC[®] unless reduced to writing and approved by an officer of the Company.
12. This warranty shall be governed by the laws of the Commonwealth of Pennsylvania.

Health and Safety Declaration for the Return of GOW-MAC Instrument Co. Equipment

In order to protect our employees from exposure to various hazards, the following statements and/or questions **MUST** be answered by you. Fill out this document in its entirety and either fax or e-mail it to GOW-MAC Instrument Co., Attn: Repair Dept, **BEFORE** returning the product.

The instrument/device/part being returned **will not** be accepted into GOW-MAC's facility until we receive this completed document. Once the product has been approved for return by our Chemical Safety Officer, an acknowledgement will be promptly issued to you with notification of your **Return Materials Authorization (RMA) number** and the procedure to follow for returning the product. *All applicable regulations should be followed when returning instrumentation, devices, and or parts.*

Customer to Record the Following:

Model # / Part #: _____

Serial #: _____

Service Technician spoken to: _____

Today's Date: _____

If this form is not approved by our chemical safety officer, the instrument/device/part WILL NOT be permitted into our facility for servicing!

A] Briefly list the application(s) for which the instrument/device/part was used, as well as any and all chemicals, gases, and/or materials analyzed and their concentrations. (**MUST be filled in**): _____

B] Is there the possibility of internal or external contamination on or in this instrument/device/part?

- Yes – see below No – proceed to C.

Please check the appropriate box.

- Chemicals or Substances That Are Hazardous to Health
- Blood, Body Fluids, (e.g. Urine, Secretions), Pathological Specimens
- Regulated Medical Wastes
- Infectious Substances or other Bio-Agents (e.g. Protein, Enzymes, Antibodies)
- Radioactive Isotopes used in the area. Detail type (ECD, Isotopic Labels, etc) and Activity in Micro Curies
- Biodegradable Material That Could Become Hazardous
- Other Hazards _____

If any of the above boxes are checked the following statements and/or questions must be answered.

1. Specifically describe where (on or in) the instrument/device/part there could be any residual contamination (for example: blood spill on the surface). _____
2. Provide details of these hazards. Include names, Material Safety Data Sheets (MSDS), and concentration of contaminants, where possible. _____
3. Describe the method of decontamination used. Attach Procedure. _____

C] I declare that the above information is true and complete to the best of my knowledge. I acknowledge that any inconsistencies between the condition of the instrument and the statements made on this form will delay the repair process.

Authorized signature _____ Date: _____

Name (Printed) _____ Phone number: _____

Company name: _____ Fax number: _____

Shipping address: _____

City: _____ State/Country: _____ Zip : _____

E-mail address: _____

BEFORE item can be shipped, fax completed form to: (610) 954-0599 or e-mail it to: repairs@gow-mac.com

For GOW-MAC Use Only:

<input type="checkbox"/> Passed Safety Inspection. OK to proceed to Repair Dept.	Signed: _____ Chem. Safety Off.	Date ____/____/____ Comments: () None
<input type="checkbox"/> Failed Safety Inspection. DO NOT proceed to Repair Dept.	RMA No: _____	() On Back >>>>



REP-005
Health-Safety Declaration Doc REV 6 (0212).docx
Rev. 6 2/15/2012, gsj

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