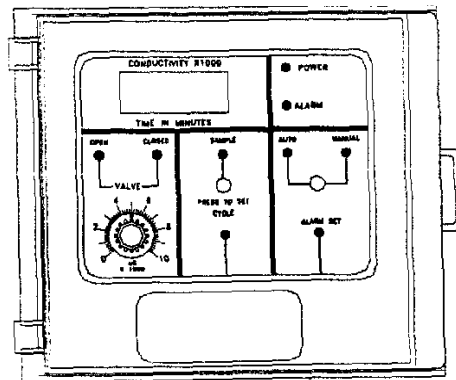


LAKWOOD INSTRUMENTS
MODEL 250 SERIES

BOILER BLOWDOWN
CONDUCTIVITY CONTROLLER
(SAMPLE/CYCLE METHOD)

INSTALLATION & OPERATION MANUAL



250 WITH DOOR CLOSED



Metex Corporation Limited

91 Kelfield St. Unit 4 • Toronto, Ontario • M9W 5A3
Telephone 416-240-1920 • Fax 416-240-7021
Website: www.metexcorporation.com

IMPORTANT NOTICE

CAUTION: CHEMICAL FEED

All electromechanical devices are subject to failure from a variety of causes. These include mechanical stress, component degradation, electromagnetic fields, mishandling, improper setup, physical abuse, chemical abuse, improper installation, improper power feeds and exposure.

While every precaution is taken to insure proper functioning, extra precautions should be taken to limit the ability of over-feeding by limiting chemical quantities available, secondary shut-downs, alarms and redundancy or other available methods.

CAUTION: POWER SOURCE AND WIRING

Low voltage wiring and high voltage (110 plus) should not be run in the same conduit. Always run separately. Even shielded low voltage is not a guarantee of isolation.

Every precaution should be taken to insure proper grounding and elimination of shorting or Electromagnetic field (EMF) interference.

CAUTION: ELECTRICAL SHOCK

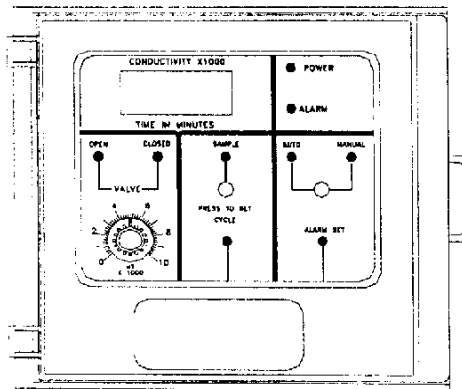
To reduce the risk of electrical shock, this equipment has a grounding-type plug that has a third (grounding) pin. This plug will only fit into a grounding-type outlet. If the plug does not fit into the outlet, contact a qualified electrician to install the proper outlet. ***DO NOT*** change the plug in any way.

MODEL 250

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MODEL 250 CYCLE/SAMPLE BOILER CONTROLLER



250 WITH DOOR CLOSED

The Model 250 Series boiler blowdown controller is intended to measure and control the surface blowdown water of boilers. By measuring the conductivity, the controller is capable of holding the boiler water conductivity within 200 $\mu\text{S}/\text{cm}$. This control results in considerable fuel savings by preventing excessive blowdown. It also protects the steam lines by preventing carryover due to excessive conductivity. The Model 250 uses the SAMPLE/CYCLE method.

This SAMPLE/CYCLE technique is intended for boilers with continuous blowdown requirements of less than 1,000 lb./hr under normal operating boiler loads. These include boilers operating at high percentage of condensate return and low make up requirements.

The Model 250 works on the "Sample-and-Hold" principle. The purpose of this "sensitivity" adjustment is to smooth out the sudden downward readings caused by steam flashing at the probe. If decreased sensitivity is required, a sensitivity pot located on the back of the front panel may be adjusted.

Benefits

By measuring the blowdown conductivity, the controller is capable of holding the boiler water conductivity with excellent results. This control results in considerable fuel savings by preventing excessive blowdown. The controller also protects the steam lines by preventing carry-over due to excessive conductivity.

Specifications

Inputs

Power 120 VAC
120/240VAC w/-F
Sensor 2-electrode Conductivity

Sensor (SR2)

Pressure 600 psi (41.4 bar)
Max. Temperature 486°F (252°C)
Body Carbon Steel
Electrode 416 SS
Insulator PEEK
Connection ¾ inch MNPT

Outputs

Relays 3 Amps @ 120 VAC
0-1 mA Non isolated
4-20 mA Isolated, w/-35

Controller

Conductivity Range 0-10,000 μ S
Accuracy \pm 100 μ S
Resolution 100 μ S
Deadband Adjustable
Setpoint 0-10,000 μ S
High Alarm Adjustable
Sample Time 0-10 min
Cycle Time 0-180 min
Ambient Temperature 32-158°F (0-70°C)
Electrical Rating UL Listed
Enclosure Rating ABS Plastic

Ordering Information

- 250 Cycle/sample type conductivity blowdown controller with high alarm. 1-10 min sample, 1-180 min cycle time. UL listed. Standard range 0-10,000 μ S (No power cord or outlets.) Requires sensor below and PL5 is recommended.

SYSTEM OPTIONS (optional, select one or more)

- AV Audible and visible alarm with "PUSH TO SILENCE" push-button.
-CR 0-5 range front panel; conductivity range is 0-5,000 μ S.
-2 Remote preamp input (use with SR2P or SR4P, below).
-F 250 VAC 50 Hz power option.

CONTROLLER OUTPUT OPTIONS (optional, select one only)

- 35 Isolated 4-20 mA output for conductivity remote data acquisition.
-42 HIGH/LOW conductivity dry alarm contacts with adjustable setpoints.
-44 Isolated 4-20 mA output, plus High/low alarms.

SENSOR OPTIONS (recommended, select one below)

- SR2P Boiler water sensor with preamp & enclosure (only w/-2 above); rated to 600 psi @ 486°F (41.4 bar @ 252°C).
SR4P 4 electrode sensor with preamp & enclosure (only w/-2 above); rated to 250 psi @ 392°F (17.2 bar @ 200°C).
SR2 Boiler water sensor with 20 ft cable, ¼ inch NPT; rated to 600 psi @ 486°F (41.4 bar @ 252°C) with elbow.

PLUMBING OPTIONS (recommended, select one below)

- PL5 Plumbing for cycle sample assembly, ½ inch (1/8 & 1/16 orifice plates and union).
PL575 Plumbing for cycle sample assembly, ¾ inch (1/8 & 1/16 orifice plates and union).
GV ½ inch forged globe valve for flow metering instead of an orifice plate and union.

MOUNTING OPTIONS (optional, select one only)

- PM Panel mount 6¼ inch square cutout.
BM Bracket for pipe mounting.

BLOWDOWN VALVE OPTIONS (optional, select one only)

- MBV1 Motorized ½ inch blowdown valve with 1036 actuator; rated to 250 psi @ 400°F (17.2 bar @ 204°C).
MBV2 Motorized ¾ inch blowdown valve with 1036 actuator; rated to 250 psi @ 400°F (17.2 bar @ 204°C).
MBV3 High pressure motorized ½ inch blowdown valve with 1275 actuator; rated to 600 psi @ 550°F (41.4 bar @ 288°C).
MBV4 High pressure motorized ¾ inch blowdown valve with 1275 actuator; rated to 600 psi @ 550°F (41.4 bar @ 288°C).
PV4 Pneumatic high pressure ½ inch blowdown valve with 1034 actuator; rated to 600 psi @ 486°F (41.4bar @ 252°C).

Installation

Refer to the drawings in the back of this manual for installation illustrations.

Plumbing Installation (WITHOUT sample cooler)

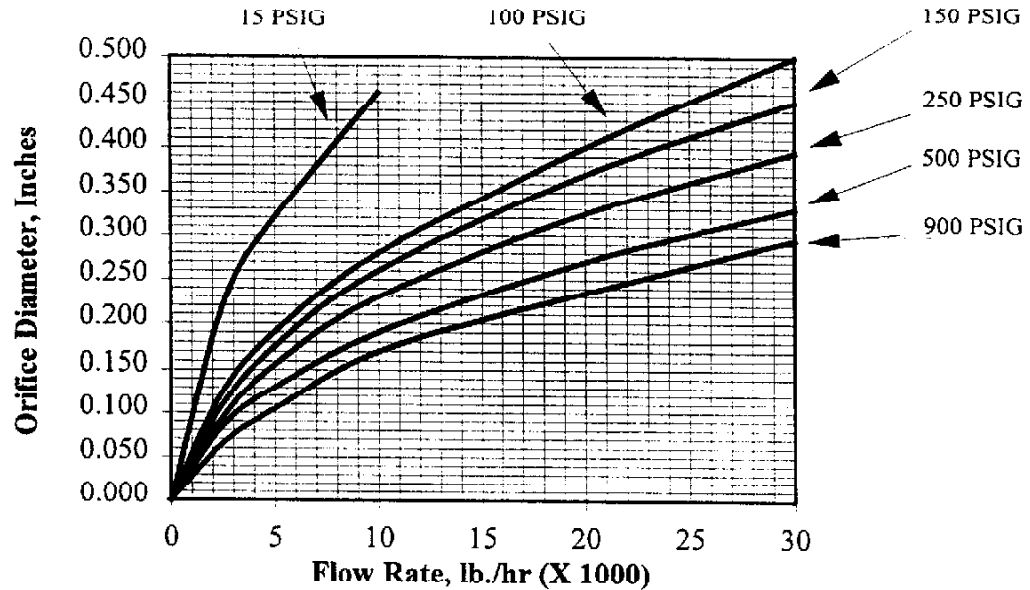
To prevent steam flashing and damage to the controller refer to the installation drawing in the back of the manual and notes below.

- Use piping from the boiler skimmer line as the sample and blowdown line.

NOTE: DO NOT USE THE BOTTOM BLOWDOWN OUTLET AS THE SAMPLE OR AUTOMATIC BLOWDOWN LINE.

- The controller must be within 20 ft of the sensor. If the -2 option is used, the sensor must be within 20 ft of the preamp. The preamp and controller can be several hundred feet apart.
- If using conduit between the sensor and preamp/controller, allow a place for water to escape if the sensor leaks. This will help prevent water damage to the preamp/controller.
- Orifice plates (or globe valve) and sensor must be installed horizontally (as shown in drawings in the back of this manual). They should also be located at least a foot or two below the boiler water level. Review the graph on the next page to determine the precise orifice size necessary to obtain the desired stream pressure downstream of the orifice.
- There should be no restrictions between the skimmer line and the orifice plates (or globe valve).

Stream Pressure as a Function of Orifice Size & Throughput Flow Rate



Plumbing Installation (WITH sample cooler)

You must use the -2 and the SR4P option when placing the conductivity sensor downstream of the sample cooler. Refer to the installation drawing in the back of the manual and notes below.

- Use piping from the boiler skimmer line to the sample cooler as the sample line.

NOTE: DO NOT USE THE BOTTOM BLOWDOWN OUTLET AS THE SAMPLE LINE.

- The preamp must be within 20 ft of the sensor. The preamp and controller can be several hundred feet apart.
- If using conduit between the sensor and preamp/controller, allow a place for water to escape if the sensor leaks. This will help prevent water damage to the preamp/controller.

SETUP AND CALIBRATION

Checking

- Check the power wiring. Make sure that the controller is connected to 120 VAC unless it is specifically set up for 220 VAC.
- Check recorder or other low power wiring. Make sure that NO power wiring is connected to low power circuits.

Setpoint

- The controller periodically samples the boiler water by opening the motorized ball valve and actuating the conductivity analyzer.
- As the sample is being taken, a conductivity reading is being analyzed by the controller. If the conductivity is above the controller front panel setpoint, the valve will remain open until the feedwater dilutes the boiler water enough to lower the conductivity below the front panel setpoint.
- Set the conductivity setpoint knob to the desired conductivity of the boiler.

Sample/Cycle

- The duration of the sample period is labeled SAMPLE TIME. The time between samples is the CYCLE TIME. Both are adjustable on the front panel.

NOTE: DURING A CYCLE TIME THE DISPLAY WILL READ "0.0".

- A speed-up button on the back of the front panel increases the SAMPLE/CYCLE time by 10.
- Set the CYCLE time by depressing the CYCLE button and adjusting the CYCLE pot with a small screwdriver until the display reads 50 (minutes), for example.
- Set the SAMPLE time by depressing the SAMPLE button and adjusting the SAMPLE pot with a small screwdriver until the display reads 2 (minutes), for example.

Alarm

- If the sample conductivity rises above the ALARM setpoint, the ALARM light will come on, and the ALARM terminals will be activated.
- The alarm setpoint is adjustable on the front panel. Press the ALARM button on the front panel and adjust the ALARM pot with a small screwdriver until the display reads the desired high conductivity alarm point. The ALARM will be activated if the conductivity rises above this level.

Sensitivity

- The Model 250 works on the "Sample-and-Hold" principle. The purpose of this "sensitivity" adjustment is to smooth out the sudden downscale readings caused by steam flashing at the probe.
- If decreased sensitivity is required, the sensitivity pot located on the back of the front panel may be adjusted clockwise. This sensitivity trim pot is 20 turns from full clockwise to full counterclockwise.

Calibration (*WITHOUT sample cooler*)

- With the boiler and controller on-line and operating properly, depress the **AUTO-MANUAL** button to the **IN** position. Valve **OPEN** light should be illuminated.
- Allow boiler water to flow past the probe for a minute or so, or until display reading stabilizes.
- Take a hot sample of the boiler water, measure with portable (hand-held) conductivity meter, and immediately calibrate the controller. It is acceptable to use a TDS meter instead of conductivity. Just convert TDS to μS using the table on the next page.
- Adjust the **CALIBRATE** pot with a small screwdriver to make the controller read the value of the **UN-NEUTRALIZED** sample.
- Take a second sample and verify calibration.
- Return **AUTO-MANUAL** button to the **OUT** position.

Calibration (*WITH sample cooler*)


- With the boiler and controller on-line and operating properly, depress the **AUTO-MANUAL** button to the **IN** position. Valve **OPEN** light should be illuminated.
- Allow boiler water to flow past the probe for a minute or so, or until display reading stabilizes.
- Take a sample of the boiler water through the sample cooler and cool to within the temperature compensation range of the portable conductivity meter (read the **UN-NEUTRALIZED** conductivity with your meter).
- Adjust the **CALIBRATE** pot with a small screwdriver to make the controller read the value of the **UN-NEUTRALIZED** sample.
- Take a second sample and verify calibration.
- Return **AUTO-MANUAL** button to the **OUT** position.

Conductivity vs. PPM Table

$\mu\text{S/cm}$	ppm	$\mu\text{S/cm}$	ppm	$\mu\text{S/cm}$	ppm
2	1	120	68	900	560
4	2.1	140	80	950	600
6	3.2	160	91	1000	630
8	4.2	180	100	1500	970
10	5.2	200	115	2000	1300
12	6.4	220	127	2500	1700
14	7.4	240	139	3000	2000
16	8.5	260	150	3400	2400
18	9.6	280	164	4000	2750
20	11.0	300	176	4500	3150
25	13.5	350	210	5000	3500
30	16.0	400	240	5500	3900
35	19.0	450	270	6000	4300
40	22.0	500	300	6500	4700
45	24.5	550	335	7000	5000
50	27.5	600	370	7500	5400
60	33.0	650	400	8000	5800
70	39.0	700	435	8500	6200
80	45.0	750	470	9000	6600
90	51.0	800	500	9500	7000
100	56.0	850	530	10,000	7400

Maintenance and Technical Service

Technical Service/Return Material Procedure

 **Technical Support for Lakewood Instruments can be reached by calling (623) 931-7332 or faxing (623) 931-7727, Monday through Friday, 7:00 a.m. - 4:30 p.m. MST.**

 **Mail and returns should be sent to:**

**OSMONICS
Phoenix Operations
4953 West Missouri Avenue
Glendale, AZ 85301-6100 USA**

When any merchandise is returned to the factory, please call and obtain a return material order (RMO) number and have the following information available:

- Customer's name, address, phone and fax numbers (shipping and billing).
- A hard copy purchase order number (no exceptions) for cases where repairs or parts are required that are not under warranty.
- A contact person's name and phone number to call if the equipment is beyond repair or to discuss any other warranty matter.
- Equipment model and serial numbers.
- Reason for return, e.g., repair, warranty, incorrect part, etc.

We will then fax to your attention an RMO form that must accompany the returned item.

NOTE: THE RMO NUMBER MUST BE CLEARLY WRITTEN ON THE OUTSIDE OF THE PACKAGE(S) BEING RETURNED.

***ANY ITEMS SENT BACK TO THE FACTORY
WITHOUT AN RMO NUMBER WILL BE REFUSED
AND RETURNED TO SENDER***

Troubleshooting

PROBLEM	WHAT THIS MEANS	CORRECTIVE ACTION								
<p>Display Reading Drifts</p>	<p>Problem may be with either the sensor or the controller. Simulate a perfect probe to determine which is causing the problem.</p>	<ol style="list-style-type: none"> Remove sensor wires from TB1 pins 5 and 6 of rear circuit board. See Drawing #5103892 for terminal block location and pin out. Resistor should be installed at TB1, pins 5 and 6 (see chart below for values). <table border="1" data-bbox="1040 554 1403 667"> <thead> <tr> <th><u>OHMS</u></th> <th><u>CONDUCTIVITY</u> <u>(μS/cm X 1000)</u></th> </tr> </thead> <tbody> <tr> <td>10</td> <td>8.3</td> </tr> <tr> <td>22</td> <td>4.9</td> </tr> <tr> <td>100</td> <td>1.1</td> </tr> </tbody> </table> Adjust the CALIBRATE pot with a small screwdriver so the display reading is equal to the conductivity value given in the chart. If the reading on the display is stable, check the wiring from the sensor. Check the sensor itself by checking continuity from each wire to its respective electrode. If the above checks are okay, check for steam flashing at the sensor. 	<u>OHMS</u>	<u>CONDUCTIVITY</u> <u>(μS/cm X 1000)</u>	10	8.3	22	4.9	100	1.1
<u>OHMS</u>	<u>CONDUCTIVITY</u> <u>(μS/cm X 1000)</u>									
10	8.3									
22	4.9									
100	1.1									
<p>Valve does not open.</p>	<p>Wiring problem or the actuator itself.</p>	<ol style="list-style-type: none"> With the boiler and controller on-line and operating properly, depress the AUTO-MANUAL button to the IN position. Valve OPEN light should be illuminated. If the valve still fails to open, check the wiring between the valve and the controller. Check for 120 VAC at the valve terminals. If the valve still fails to open, check the actuator wiring. If all is correct then replace the actuator on the valve. 								
<p>Boiler conductivity continuously below setpoint.</p>	<p>Bypass valve is open or cycle time may need to be increased.</p>	<ol style="list-style-type: none"> Check for open bypass valve. Eliminate all sources of uncontrolled blowdown. Check for leaking at the bottom of the manual blowdown valve. If above tests are okay, increase CYCLE time. 								

PROBLEM	WHAT THIS MEANS	CORRECTIVE ACTION
Boiler conductivity continuously above setpoint.	Closed or restricted valve or incorrect orifice size.	<ol style="list-style-type: none"> 1. Check blowdown line for closed or restricted valve. 2. Increase orifice size. Reduce cycle time.
Sudden increase in boiler conductivity.	Loss of or contamination of condensate.	<ol style="list-style-type: none"> 1. Check for loss of condensate. 2. Check for condensate contamination. 3. Check for Softener backwash valve failure. Replace if necessary.
Boiler solids maintained most of the time, but sometimes solids are WAY below setpoint.	Problem with boiler low fire period.	<ol style="list-style-type: none"> 1. Does the boiler go to low fire often? 2. If low fire period is <u>under</u> one hour, increase cycle time. 3. If low fire period is <u>over</u> one hour, install a relay to shut off the controller AND close the valve during low fire.
Poor control and frequent calibration.	Sensor fouling or steam flashing.	<ol style="list-style-type: none"> 1. Check for contaminated boiler water. 2. Clean or replace fouled sensor. 3. Check plumbing and orifice plates.

Replacement Parts

<u>Part Number</u>	<u>Description</u>
67162	Boiler Sensor (SR, SR2, SR2P)
68074	4-Electrode Boiler Sensor (SR4P)
66355	1/16 inch orifice plate
66354	1/8 inch orifice plate
67972	3/8 inch orifice plate
66356	1/4 inch orifice plate
67244	1/2 inch union
66648	Repair kit for 1/2 inch MBV1 Valve
66650	1/2 inch MBV1 Valve

NOTES: UNLESS OTHERWISE SPECIFIED:

- 1. PANEL CUTOFF HOLE
6.25" X 6.25" (160mm X 160mm)

MOUNTING FEET REMOVED
PRIOR TO INSTALLATION

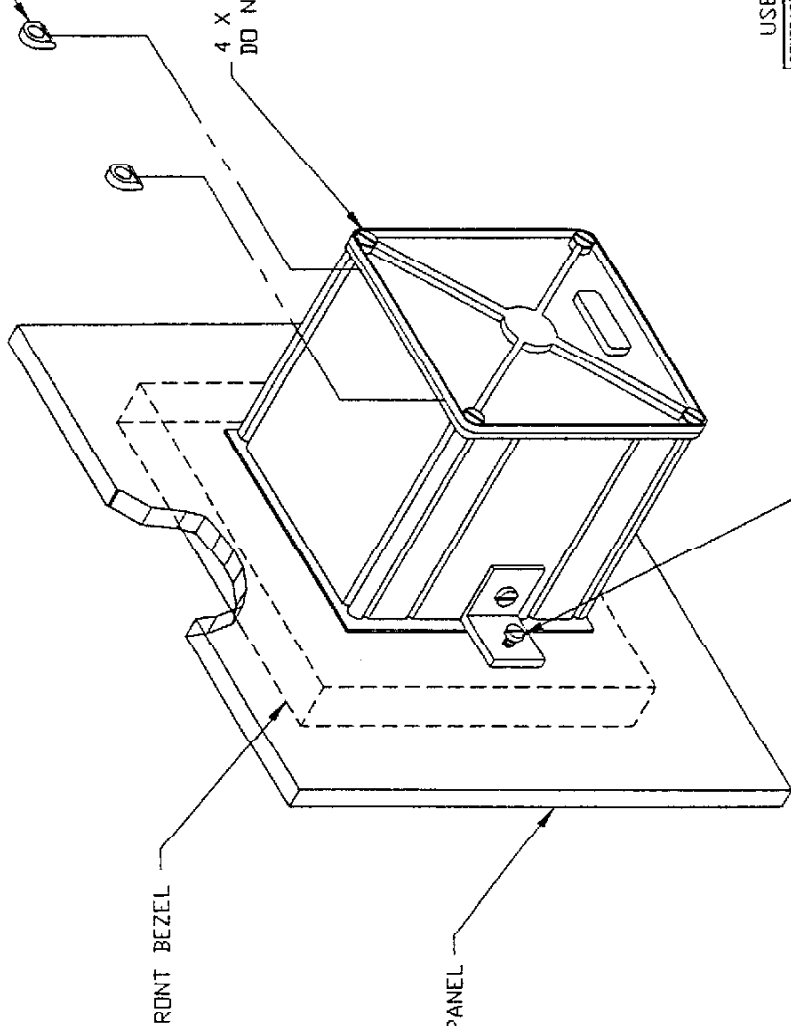
4 X BACK PLATE SCREWS
DO NOT OVER TIGHTEN

FRONT BEZEL

MOUNTING PANEL

NYLON PANEL MOUNT SCREWS (2)
DO NOT OVER TIGHTEN

REVISIONS				
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	A1	W/D 0540	MAG 5/94	

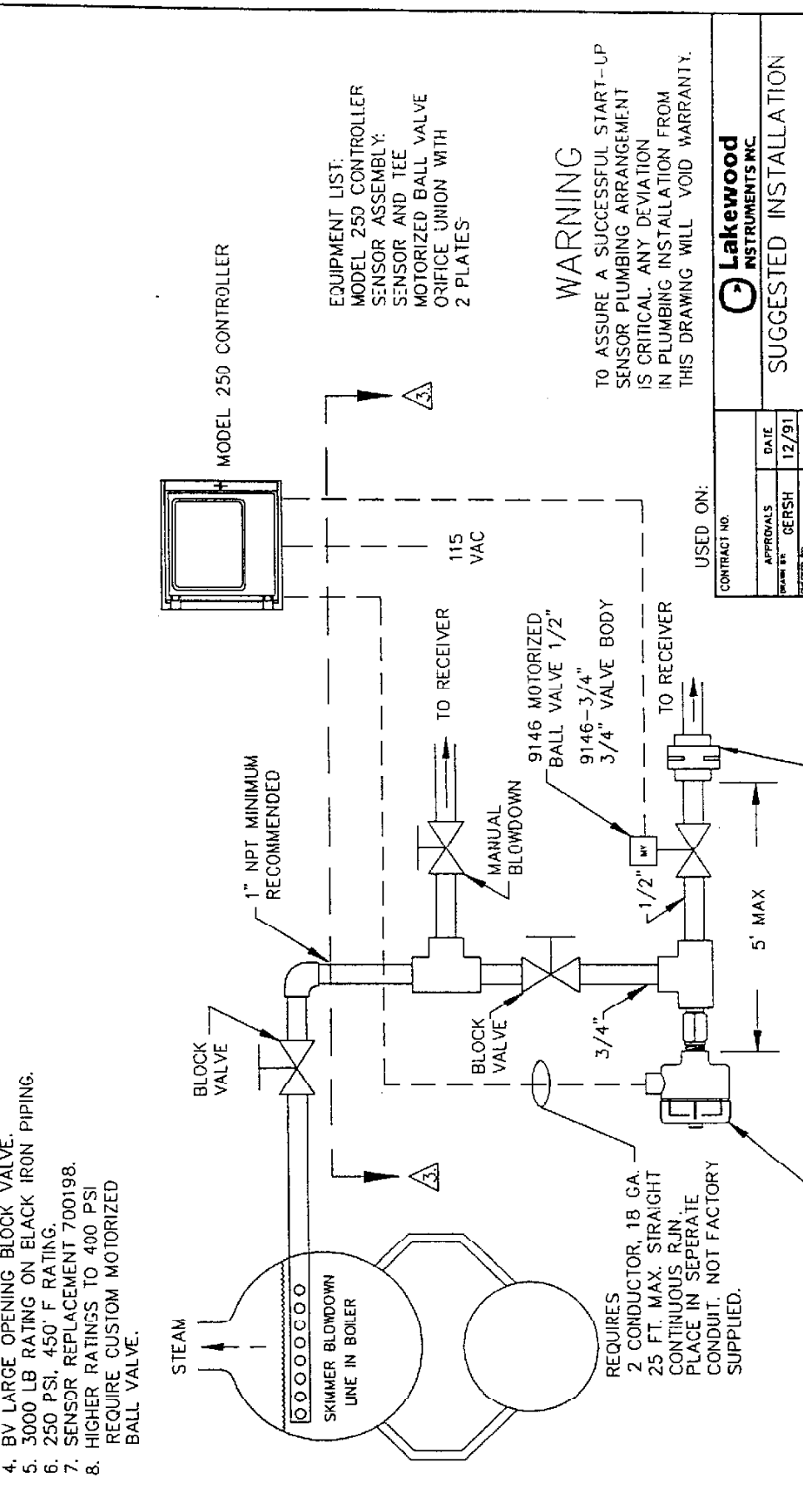


USED ON:

		DRAWING - ASSEMBLY PANEL MOUNTING NEMA 4 ENCLOSURE		REV. A1
CONTRACT NO.	DATE 11/83	SITE B	DRAWING NUMBER 5100789	SHEET 1 OF 1
APPROVALS BY: HI	DATE 11/83	DATE 5/94	WORK NUMBER	
CHECKED BY:				
DESIGN ACTIVITY				
ACCEPTED BY:				

REVISIONS			
ZONE	REV	DESCRIPTION	DATE
	D	SEE ECN 0242 MAG 10/92	
	E	SEE ECN 0253 MAG 11/92	

NOTES: UNLESS OTHERWISE SPECIFIED:
 1. WIRING BY LAKEWOOD
 2. WIRING BY OTHERS
 3. LOCATE PLUMBING ASSEMBLY AS CLOSE TO THE FLOOR AS POSSIBLE.
 4. BY LARGE OPENING BLOCK VALVE.
 5. 3000 LB RATING ON BLACK IRON PIPING.
 6. 250 PSI, 450 F RATING.
 7. SENSOR REPLACEMENT 700198.
 8. HIGHER RATINGS TO 400 PSI REQUIRE CUSTOM MOTORIZED BALL VALVE.



EQUIPMENT LIST:
 MODEL 250 CONTROLLER
 SENSOR ASSEMBLY:
 SENSOR AND TEE
 MOTORIZED BALL VALVE
 ORIFICE UNION WITH
 2 PLATES

WARNING

TO ASSURE A SUCCESSFUL START-UP
 SENSOR PLUMBING ARRANGEMENT
 IS CRITICAL. ANY DEVIATION
 IN PLUMBING INSTALLATION FROM
 THIS DRAWING WILL VOID WARRANTY.

USED ON:

CONTRACT NO.		Lakewood INSTRUMENTS INC.	
APPROVALS	DATE	SUGGESTED INSTALLATION	
DESIGNED BY: GERSH	12/91	REV	
DATE		DATE CODE	5102000-01
REVISION		REV	E
DATE		REV	7

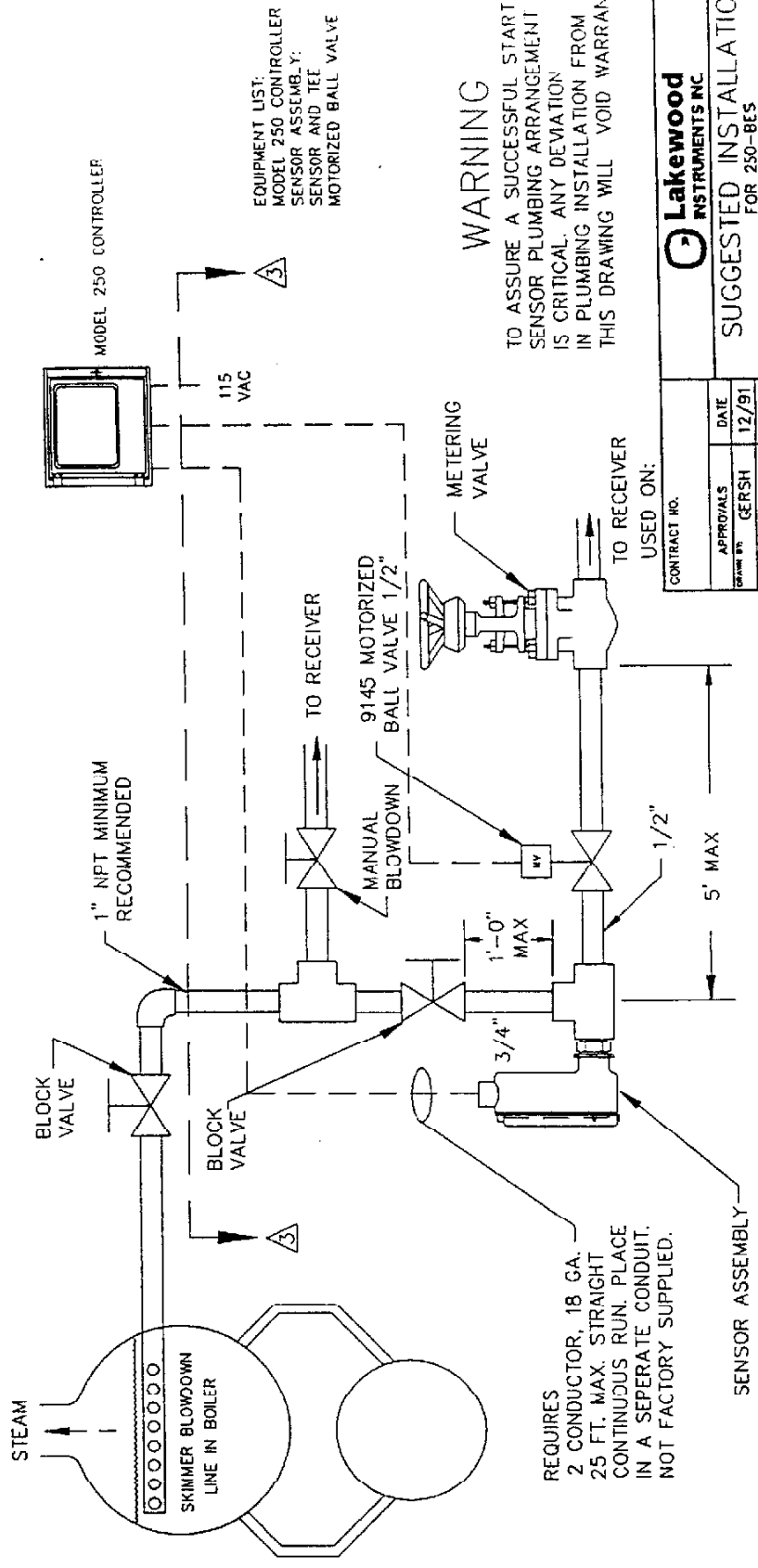
700392
ORIFICE
UNION

SENSOR ASSEMBLY

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVALS
	D	SEE ECN 0242	MAG 10/92	
	E	SEE ECN 0253	MAG 11/92	

NOTES: UNLESS OTHERWISE SPECIFIED;

1. WIRING BY LAKEWOOD
2. WIRING BY OTHERS
3. LOCATE PLUMBING ASSEMBLY AS CLOSE TO THE FLOOR AS POSSIBLE.
4. BY LARGE OPENING BLOCK VALVE.
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8. SENSOR REPLACEMENT 700198.



EQUIPMENT LIST:
 MODEL 250 CONTROLLER
 SENSOR ASSEMBLY:
 SENSOR AND TEE
 MOTORIZED BALL VALVE

WARNING

TO ASSURE A SUCCESSFUL START-JP
 SENSOR PLUMBING ARRANGEMENT
 IS CRITICAL. ANY DEVIATION
 IN PLUMBING INSTALLATION FROM
 THIS DRAWING WILL VOID WARRANTY.

REQUIRES
 2 CONDUCTOR, 18 GA.
 25 FT. MAX. STRAIGHT
 CONTINUOUS RUN. PLACE
 IN A SEPERATE CONDUIT.
 NOT FACTORY SUPPLIED.

SENSOR ASSEMBLY

CONTRACT NO. _____

APPROVALS: _____ DATE: 12/91

DESIGNED BY: GERSH

DATE: _____

REVISIONS: _____

ACCEPTED BY: _____

Lakewood INSTRUMENTS INC

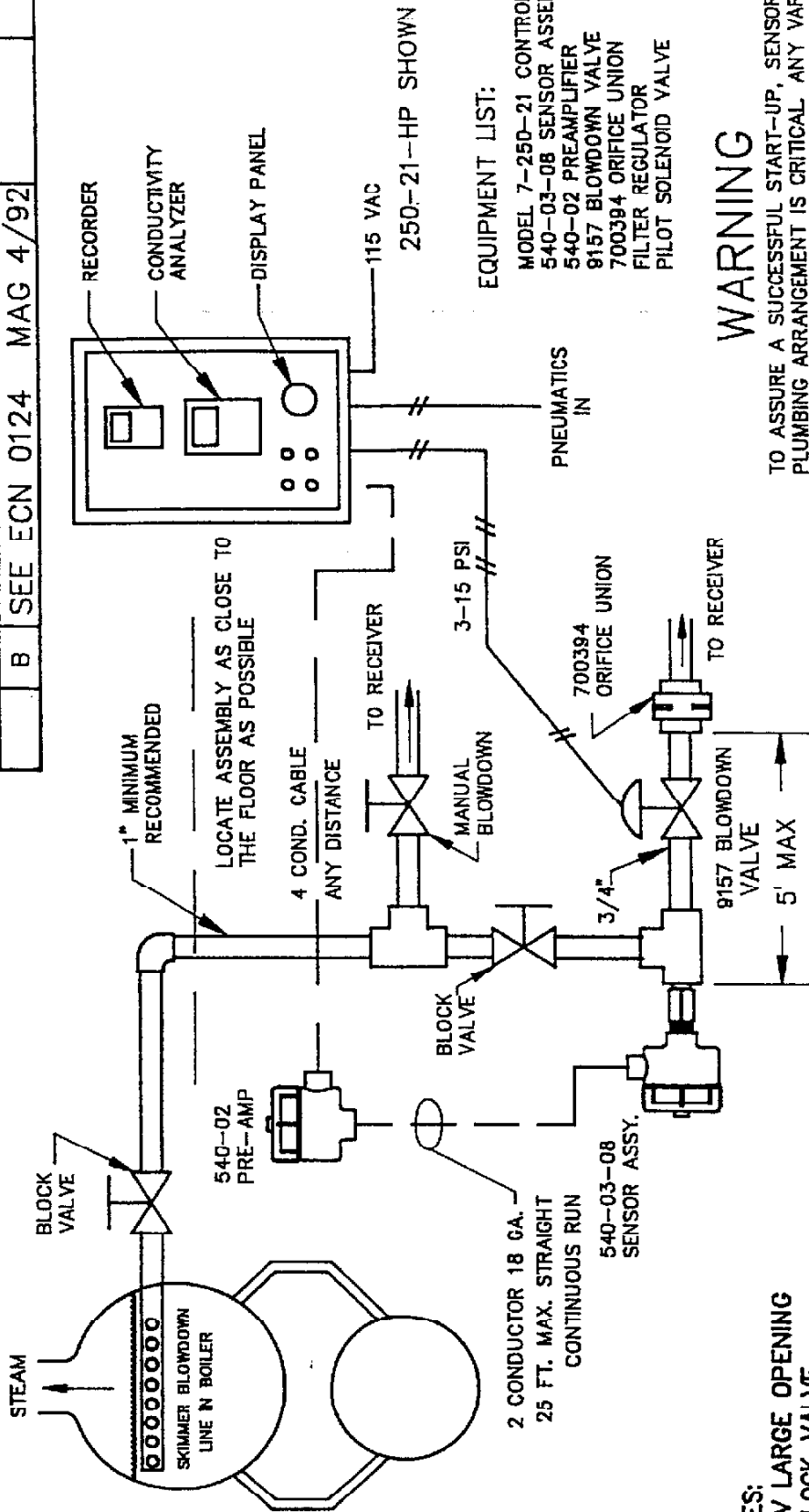
SUGGESTED INSTALLATION FOR 250-BES

DATE CODE: B DRAWING NUMBER: 5102000-02 REV: E

SCALE: NONE SHEET NUMBER: 250BES SHEET 2 OF 2

REVISIONS

ZONE	REV	DESCRIPTION	DATE	APPROVALS
	A	SEE ECN 00023	MAG 12/91	
	B	SEE ECN 0124	MAG 4/92	



- EQUIPMENT LIST:
- MODEL 7-250-21 CONTROLLER
 - 540-03-08 SENSOR ASSEMBLY
 - 540-02 PREAMPLIFIER
 - 8157 BLOWDOWN VALVE
 - 700394 ORIFICE UNION
 - FILTER REGULATOR
 - PILOT SOLENOID VALVE

WARNING

TO ASSURE A SUCCESSFUL START-UP, SENSOR PLUMBING ARRANGEMENT IS CRITICAL. ANY VARIATION IN PLUMBING INSTALLATION FROM THIS DRAWING WILL VOID THE WARRANTY.

USED ON:

CONTRACT NO.	
APPROVALS	DATE
DRAWN BY: WRD	3/88
CHECKED BY:	
ENGINEER:	
DESIGN ACTIVITY:	
ACCEPTED BY:	

NOTES:

1. BY LARGE OPENING BLOCK VALVE.
2. 3000 LB RATING ON BLACK IRON PIPING.
3. MODEL 7250 CONTROLLER INCLUDES FILTER REGULATOR AND AIR PILOT SOLENOID VALVE.
4. 850 PSI 550 F RATED SYSTEM.
5. 9157 VALVE FISHER 1" 667ES OR EQUAL.
6. HIGH PRESSURE OPTIONS SHOWN.
7. SAMPLE/CYCLE METHOD FOR BOILERS LESS THAN 1000 LBS/HR BLOWDOWN.



SUGGESTED INSTALLATION
7-250-RP-21-HP

SIZE	CAGE CODE	DRAWING NUMBER	REV.
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SCALE: NONE	MODEL NUMBER 7-250-21	SHEET 1 OF 1	

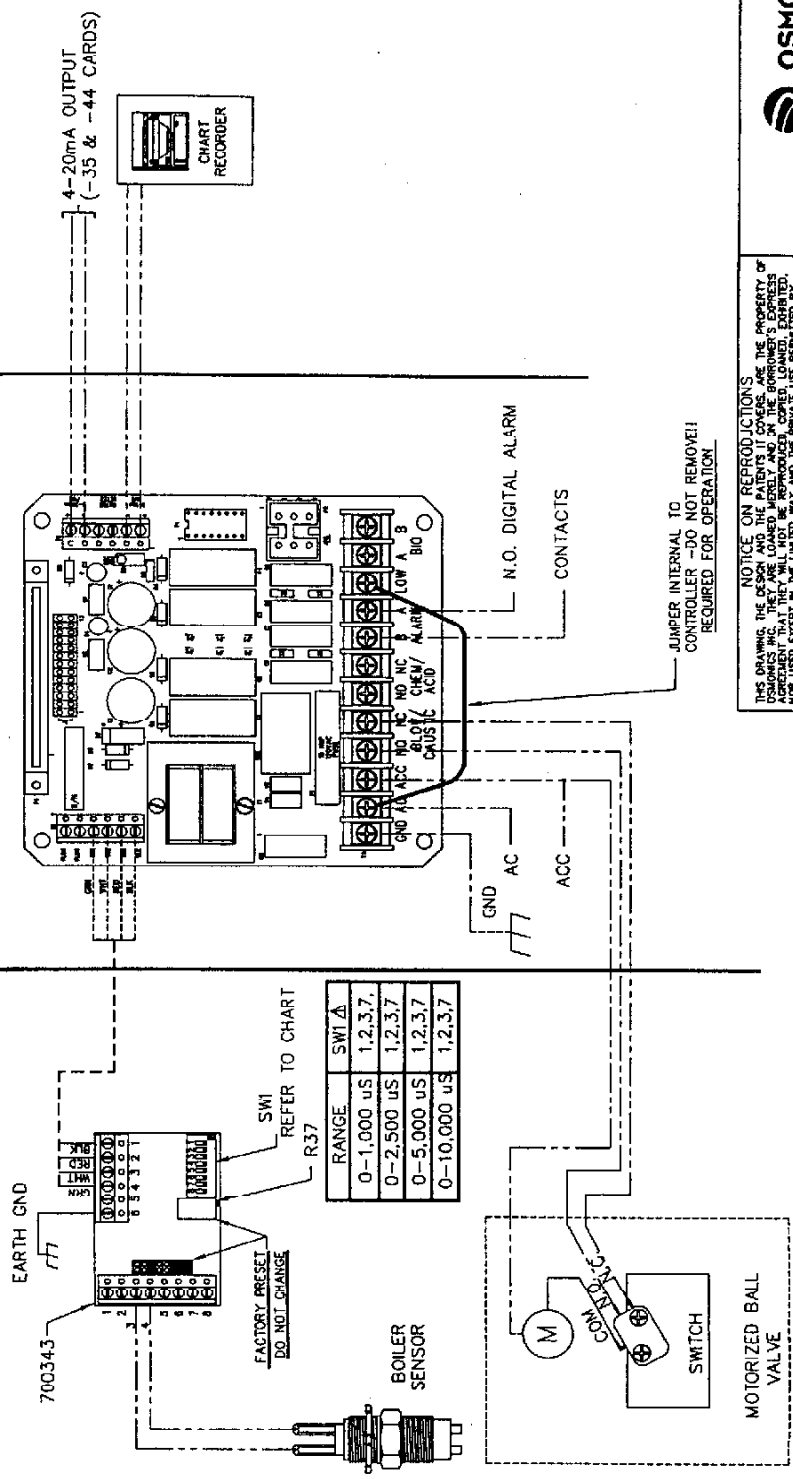
REVISION HISTORY				
REV	DESCRIPTION	ECO	DWG	DATE
A	RELEASE	1809	-JM	22OCT198

REMOTE

CONTROLLER

FIELD WIRING

- NOTES: UNLESS OTHERWISE SPECIFIED
 1. POWER CONSUMPTION—2 AMPS.
 2. WIRING BY LAKEWOOD
 3. WIRING BY OTHERS



REF LAKEWOOD 1103983



PHOENIX OPERATIONS

TITLE DWG - WIRING, M250/260-RP
 UNIVERSAL BACKBOARD

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FINISH	FRAC	DECIMALS	ANGLES
	.XX ± .03	.XXX ± .010	±.5°
ORDER NO.	DWG	T.M.	DATE
	CHKD		DATE
CUSTOMER LOC.	APVD		DATE
DO NOT SCALE	APVD		DATE

SIZE	B	FILE TYPE	.DWG	SHEET 1 OF 1
REV	A			

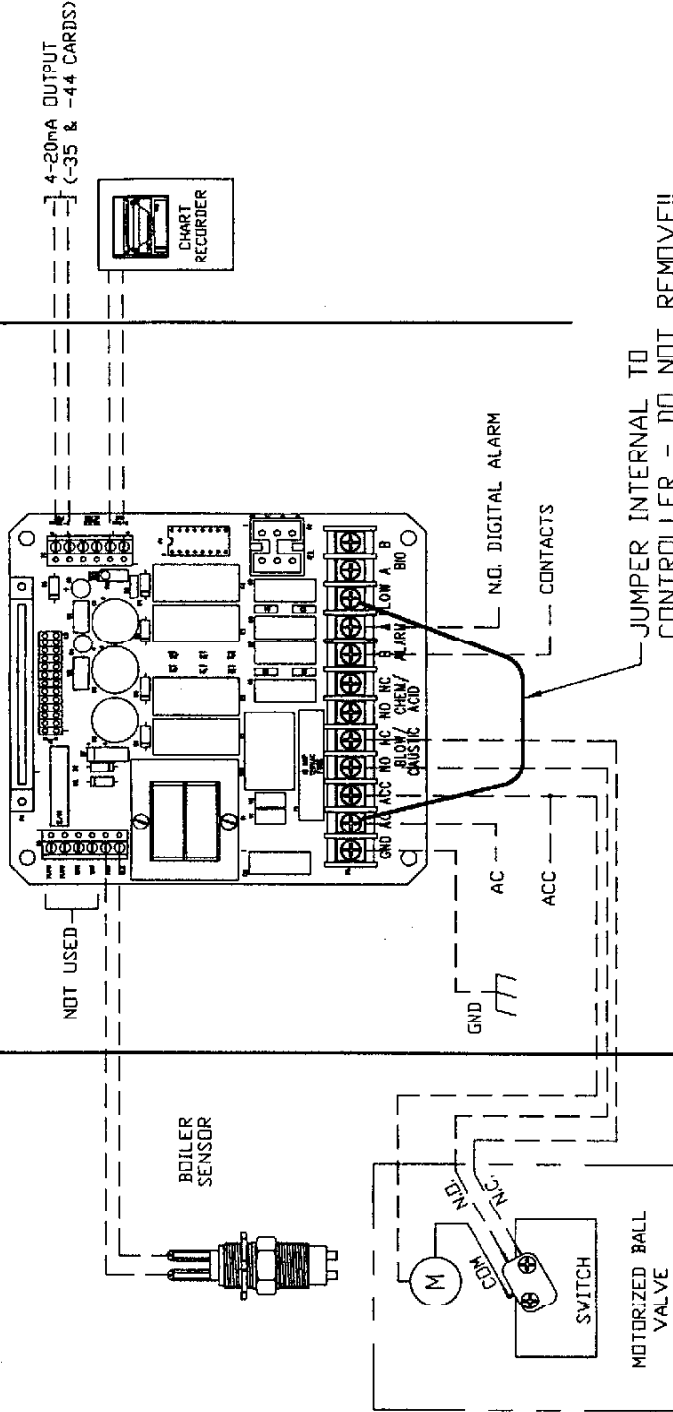
P/N 61678 REV-A PG-1/2

- NOTES: UNLESS OTHERWISE SPECIFIED
 1. POWER CONSUMPTION-2 AMPS.
 2. WIRING BY LAKEWOOD
 3. WIRING BY OTHERS

FIELD WIRING

CONTROLLER

REMOTE



JUMPER INTERNAL TO CONTROLLER - DO NOT REMOVE!! REQUIRED FOR OPERATION

REVISION HISTORY					
REV	DESCRIPTION	ECO	DWN	DATE	APVD
A	RELEASE	18D9	T.M.	22OCT98	

LAKEWOOD 5103892



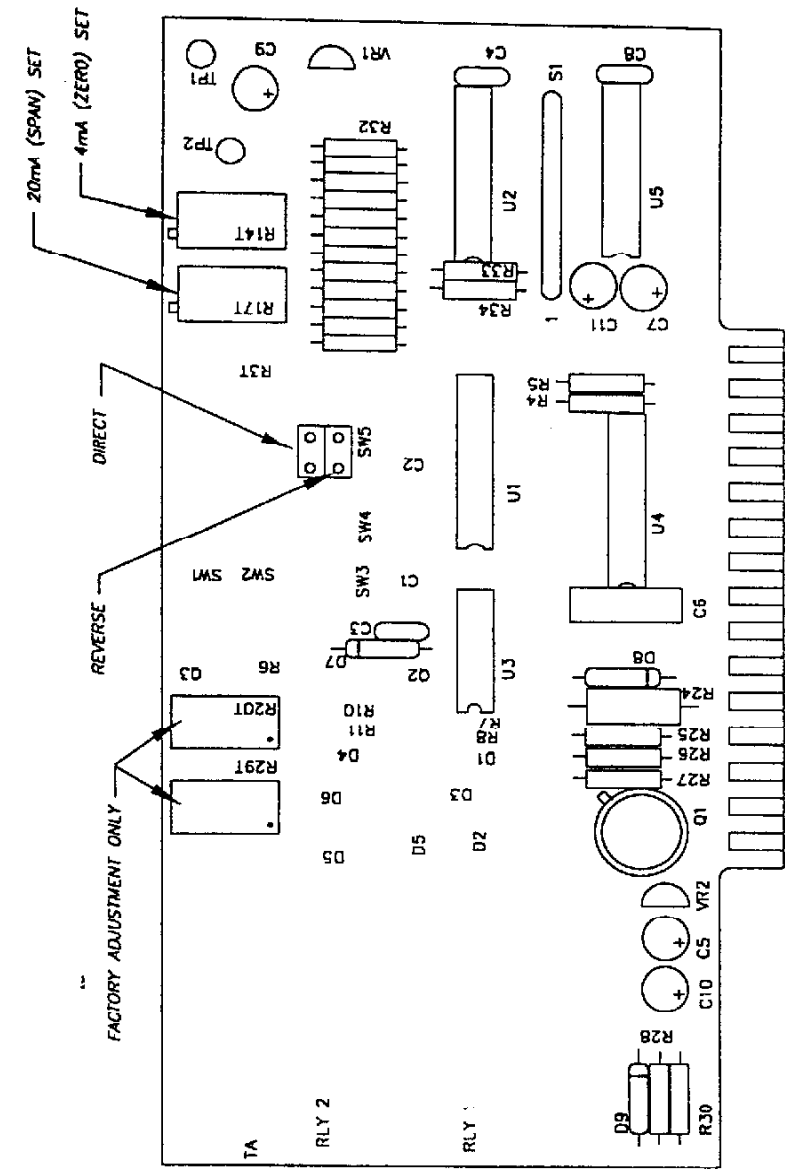
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FRAC	DECIMALS	ANGLES	TITLE
.XX ± .03	.XXX ± .01	± .5°	DWG - WIRING M250/260 UNIVERSAL BACKBOARD
DWN T.M.	DATE 22OCT98	DATE	SIZE B
CHKD	DATE 12/2/98	DATE	DWG NO./PK 1107167
APVD	DATE	DATE	SCALE NONE
APVD	DATE	DATE	FILE TYPE .DWG
DO NOT SCALE			SHEET 1 OF 1

NOTES: UNLESS OTHERWISE SPECIFIED:

- 44 OPTION BOARD COMBINES
-35 4-20mA
- 42 2 ALARM RELAYS
- SEE 5102840 FOR ALARM RELAY DETAIL.
- SW5 UPPER DIRECT, LOWER REVERSE

REVISION HISTORY				
REV	DESCRIPTION	ECO	DWN	DATE
A	RELEASE	0769	EV	10/14/96



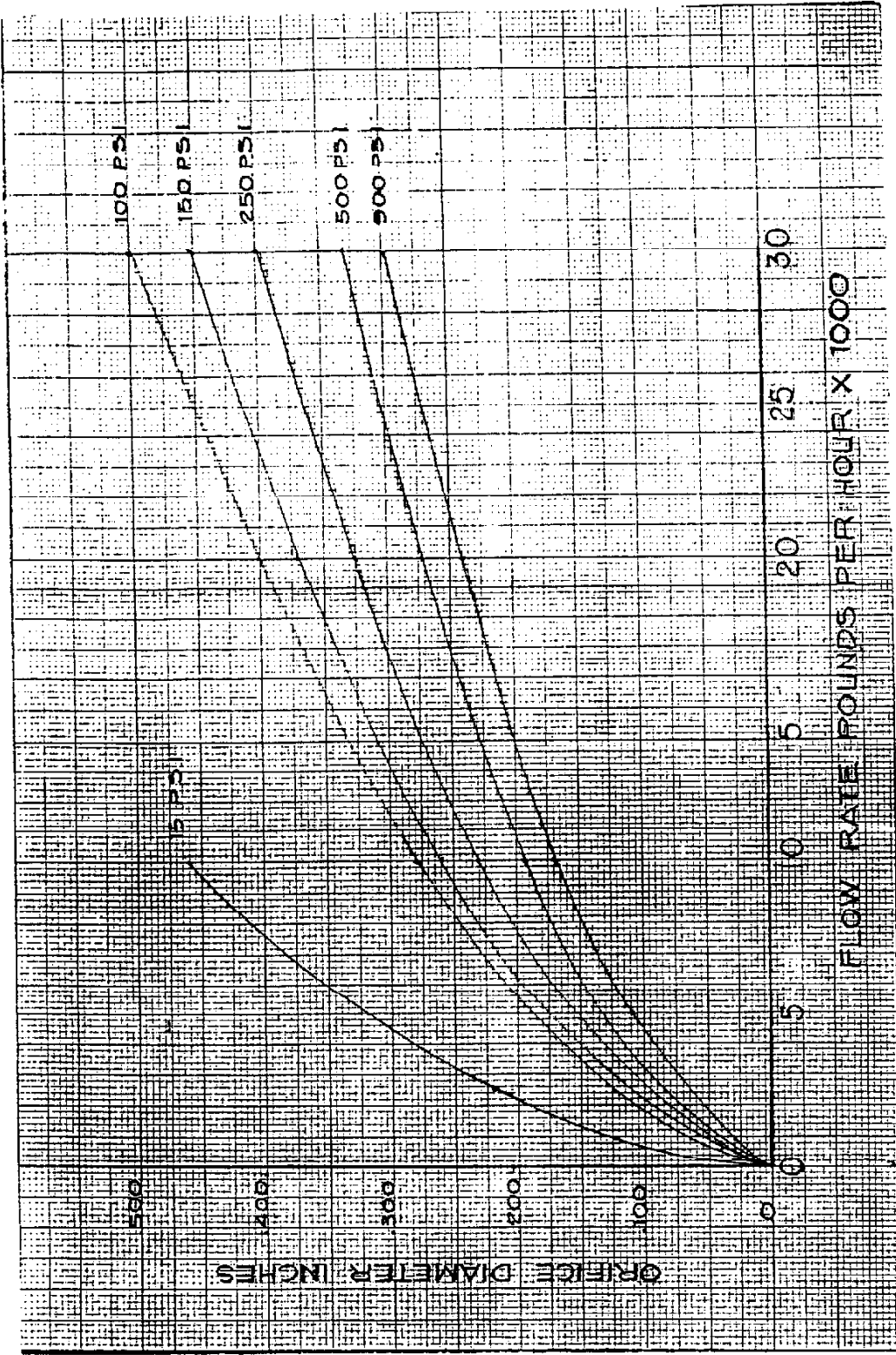
PHOENIX OPERATIONS

TITLE
DRAWING, ASSEMBLY
ISOLATED OUTPUT, -35 OPTION

SIZE	DWG NO/PN	REV
A	67533	A
SCALE	FILE TYPE .DWG	SHEET 1 OF 1
NONE		

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MATERIAL	FRAC	TOLERANCES UNLESS NOTED	ANGLES
N/A		DECIMALS	
FINISH		.XX ± .05	
ORDER NO.		.XXX ± .010	± .5°
CUSTOMER	DWN	DH/EV	DATE 12/89
CUSTOMER LOC.	CHKD	DATE	DATE 1/19/96
USED ON	APVD	DATE	DATE 06/14
APPLICATION	APVD	DATE	



DATE 3-29-82	APPROVED	REV. A 3-6-89
DR. BY BWD.	ORIFICE SIZING CHART	
SCALE <i>~</i>	69952	
MODEL NO. 260	DWG. NO. 5000193	

REV. A MODEL 260 WAS MODEL 271.

MHO/CM	PPM TDS	MHO/CM	PPM TDS	MHO/CM	PPM TDS
2	1	120	68	900	560
4	2.1	140	80	950	600
6	3.2	160	91	1000	630
8	4.2	180	100	1500	970
10	5.2	200	115	2000	1300
12	6.4	220	127	2500	1700
14	7.4	240	139	3000	2000
16	8.5	260	150	3400	2400
18	9.6	280	164	4000	2750
20	11.0	300	176	4500	3150
25	13.5	350	210	5000	3500
30	16.0	400	240	5500	3900
35	19.0	450	270	6000	4300
40	22.0	500	300	6500	4700
45	24.5	550	335	7000	5000
50	27.5	600	370	7500	5400
60	33.0	650	400	8000	5800
70	39.0	700	435	8500	6200
80	45.0	750	470	9000	6600
90	51.0	800	500	9500	7000
100	56.0	850	530	10,000	7400



DATE	3-5-82	APPROVED	REV. B 10-30-90
DR. BY	H D	CONDUCTIVITY/PPM CHART	
SCALE	∞		
MODEL NO.	250/260	DWG. NO.	5000192

REV. B MODEL 250/260 WAS MODEL 260.