



## GAS SATURATORS MODELS 1200 & 600

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### Function

The Models 1200 and 600 Gas Saturators provide the highest degree of functionality and operating simplicity offered in precision gas saturator systems.

Each saturator is designed to deliver a saturated gas flow that can be controlled with a dewpoint accuracy of  $\pm 2^{\circ}\text{C}$ .

These precise dewpoints are achieved by forcing inlet gas to pass through a series of dispersion plate-shelves that are contained inside a temperature controlled water tank. Tiny holes in the dispersion plates "break" the gas into many small bubbles. As these bubbles flow through the water, they are wetted.

Two complete sets of dispersion plate-shelves in each saturator breaks inlet gas up twice, to ensure complete wetting of the gas as it passes with minimum resistance to flow through the water reservoir.

Saturated gas exits each unit with a dewpoint that is equal to the programmed gas temperature.

### Features and Benefits

- **Automatically controlled water level** - Water level in each saturator is automatically maintained at optimum levels through a series of float switches that control the water-fill solenoid valve.
- **Condensation protection** - An insulation and shielding system prevents internal condensation when the dewpoint is set above ambient temperatures.
- **Protection of gas purity** - Stainless steel and high temperature plastics are used throughout each saturator system to maintain the purity of process gases.
- **Overtemperature protection** - An independent thermostatic switch is provided to protect the

system from heater or heater system control failure.

- **Ease of maintenance** - All serviceable components are mounted on the front panel for easy access.

### Specifications

Maxim gas flow rates:

Model 1200	1200 CFH
Model 600	600 CFH

Maximum gas inlet pressure	20 PSIG
Minimum gas inlet pressure	10 PSIG
Dewpoint range	Ambient to $+ 65^{\circ}\text{C}$
Dewpoint tolerance	$\pm 2^{\circ}\text{C}$
Pressure drop	Less than 5 PSIG
Water level control	Automatic
Water requirements	1/2 gallon/hour deionized water when operating at capacity.

### Installation

1. If the saturator is factory-installed on the furnace, it will only be necessary to connect the water and gas plumbing, and insulate the plumbing lines from the saturator to the furnace gas inlet (you must insulate this line).
2. After connecting the water supply, energize the control panel and check that the water fill solenoid is energized.

Note: Each gas saturator is designed for use with de-ionized water which is required to protect your furnace process chamber and/or product. Consult your BTU service engineer if de-ionized water is not available.

## Operation

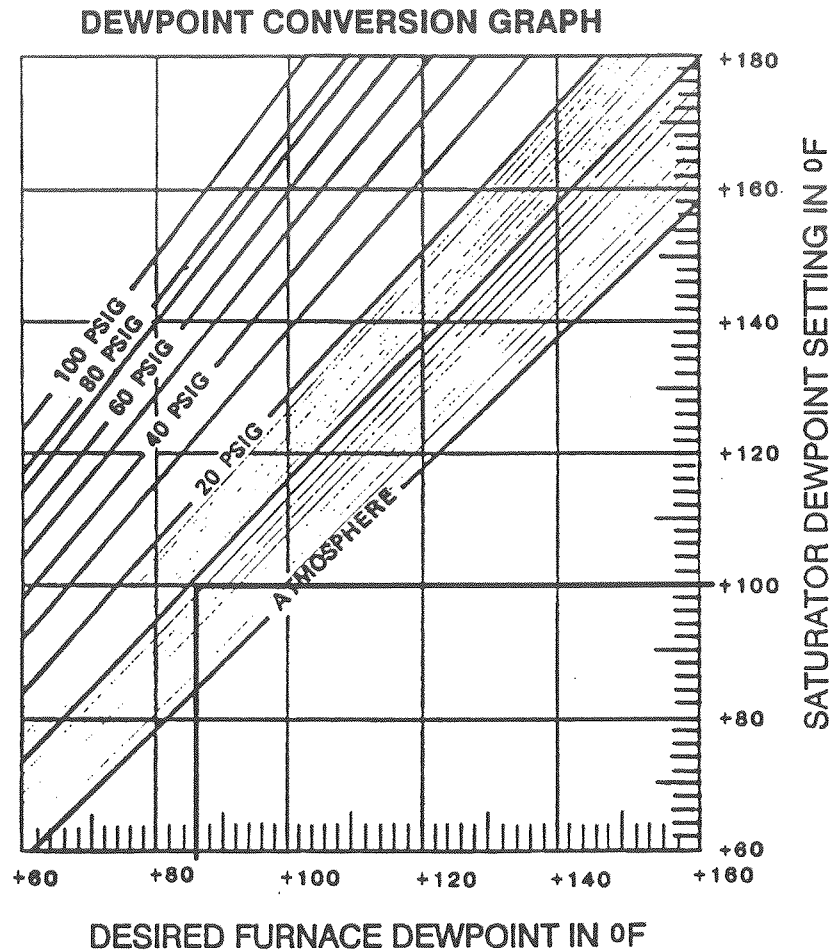
1. Select your desired furnace dewpoint on the Dewpoint Conversion Graph, then locate the corresponding Saturator Dewpoint Setting for your supply pressure.

*For example, if your desired furnace dewpoint is 86°F with an inlet gas supply pressure of 10 PSIG, the corresponding Saturator Dewpoint Setting would be 100°F (see graph).*

2. When your furnace is operating in COVER GAS MODE, set your furnace controller to the Saturator Dewpoint Setting determined in #1 above.

3. Turn the saturator's POWER and HEAT switches to the ON position. The saturator will fill with water and then begin to heat-up.
4. When the saturator reaches operating temperature, your furnace may be switched from dry to wet gas operation.

Note: A needle valve is provided in the water supply line to restrict the water flow rate. Too rapid of an introduction of cold water will affect the stability of the controlled dewpoint. Under normal operating conditions, the OVERFILL lamp must not turn on.

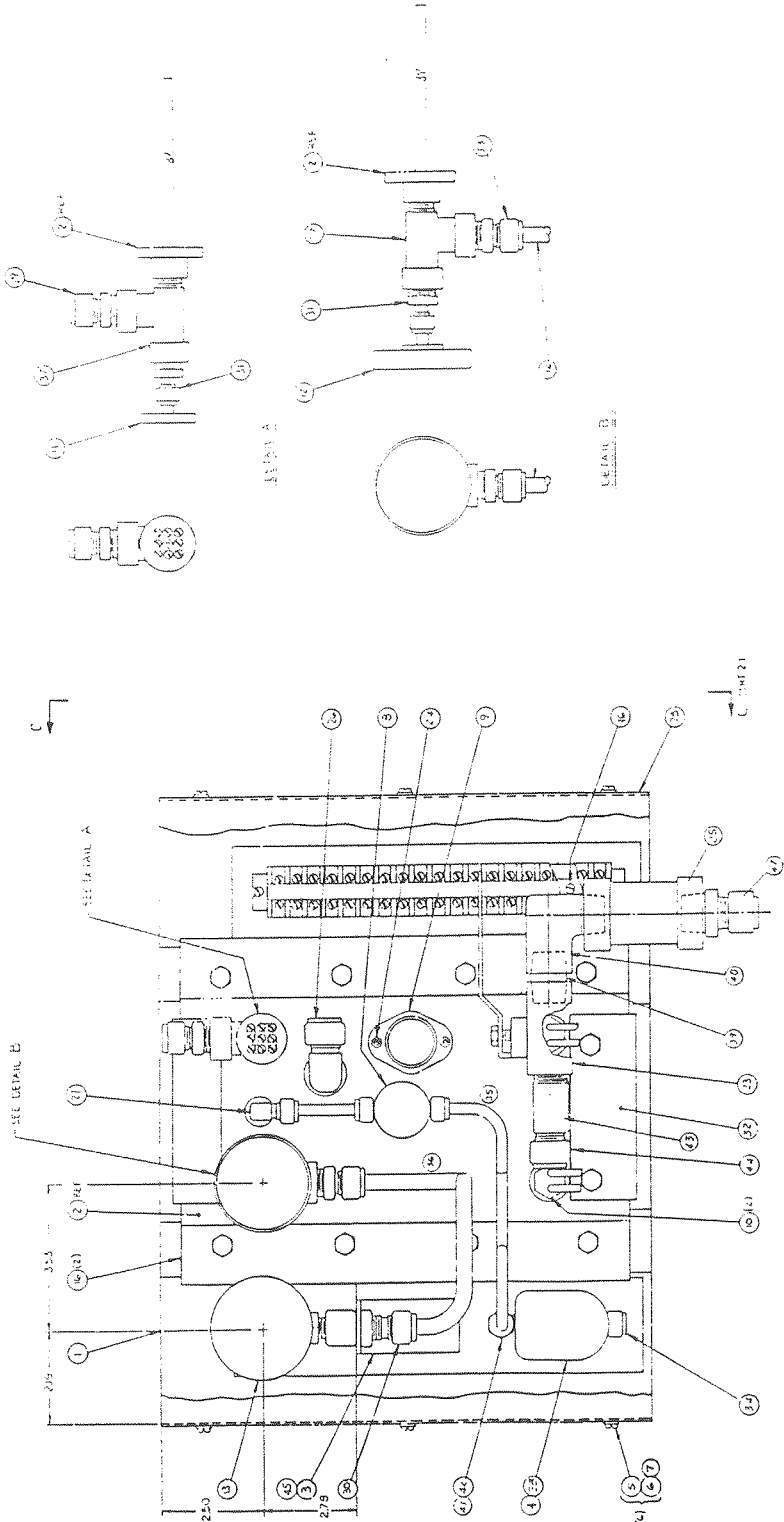


## Maintenance

The system is virtually maintenance free, however you should periodically drain the water reservoir to remove any possible buildup of impurities.

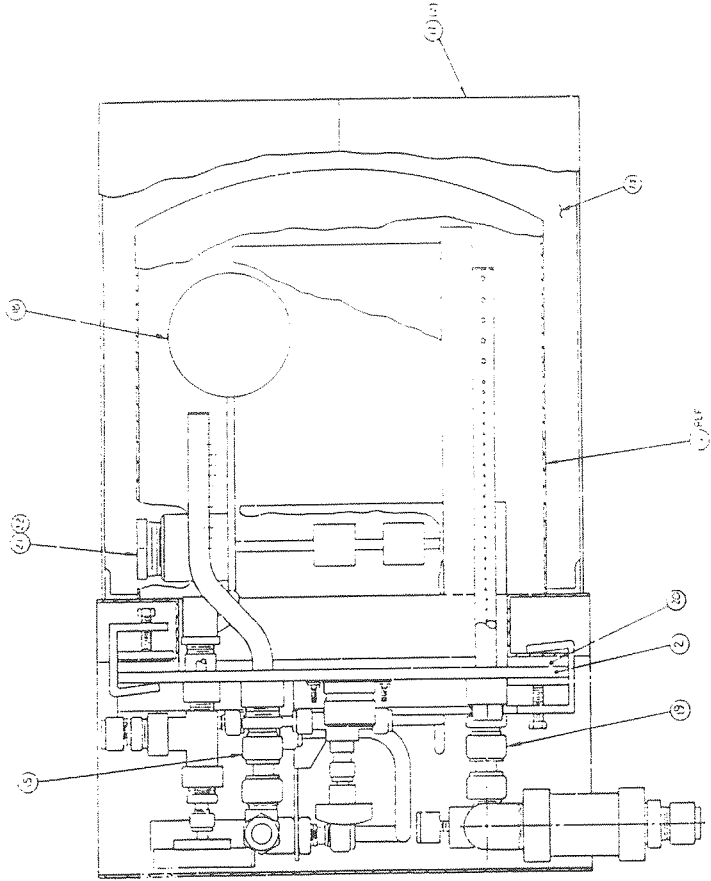
## Reference Drawings

The Model 1200 and Model 600 Wiring and Assembly drawings are attached for your reference.

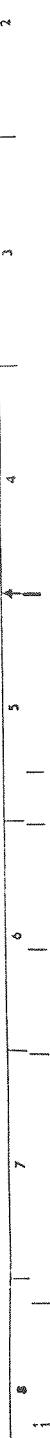


SEE DRAWING 100021	PART NO. 100021	QUANTITY 1	UNIT EACH	PRICE \$ 1.00	TOTAL \$ 1.00
BUNKER GAS SYSTEM <b>800 CFM</b>					

600 CFH

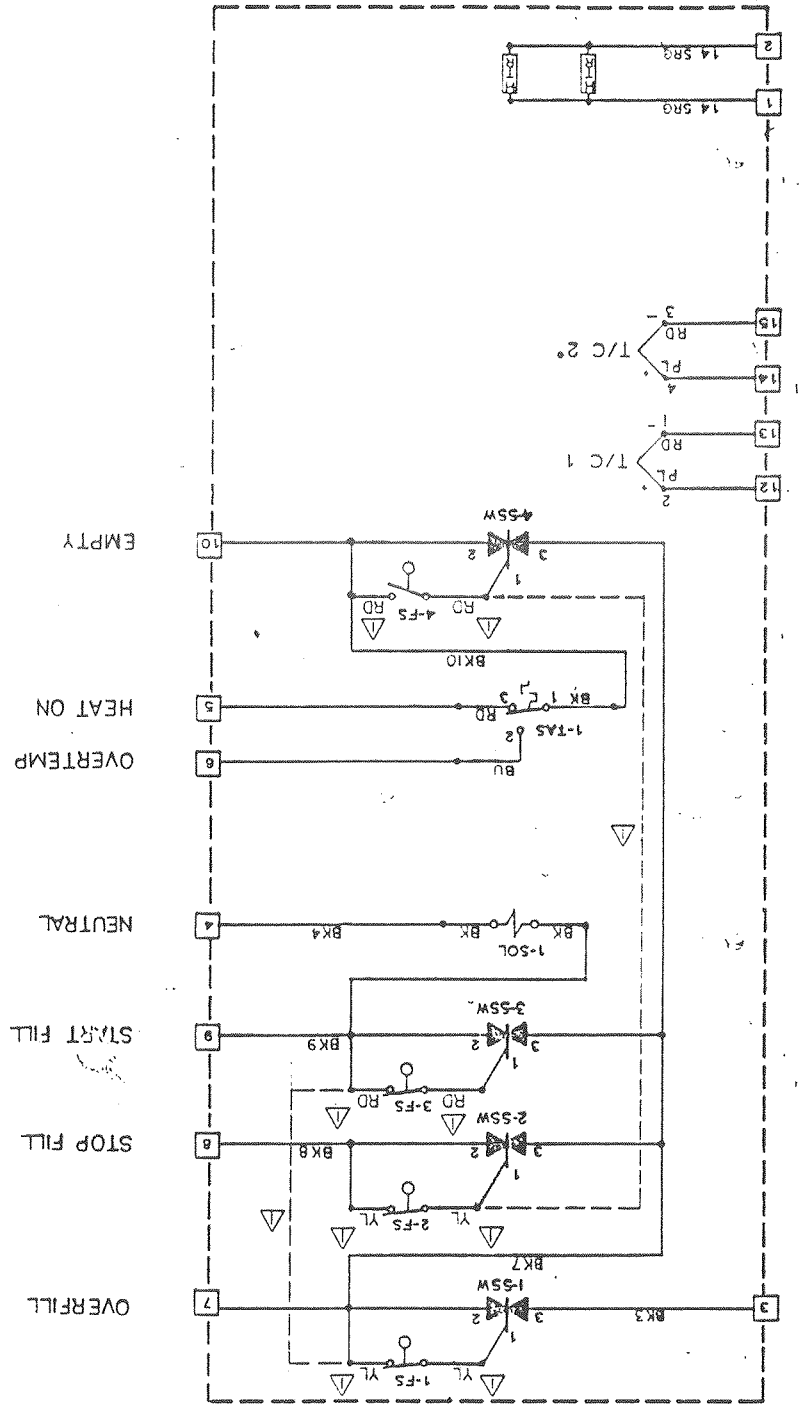


NEW C.C.



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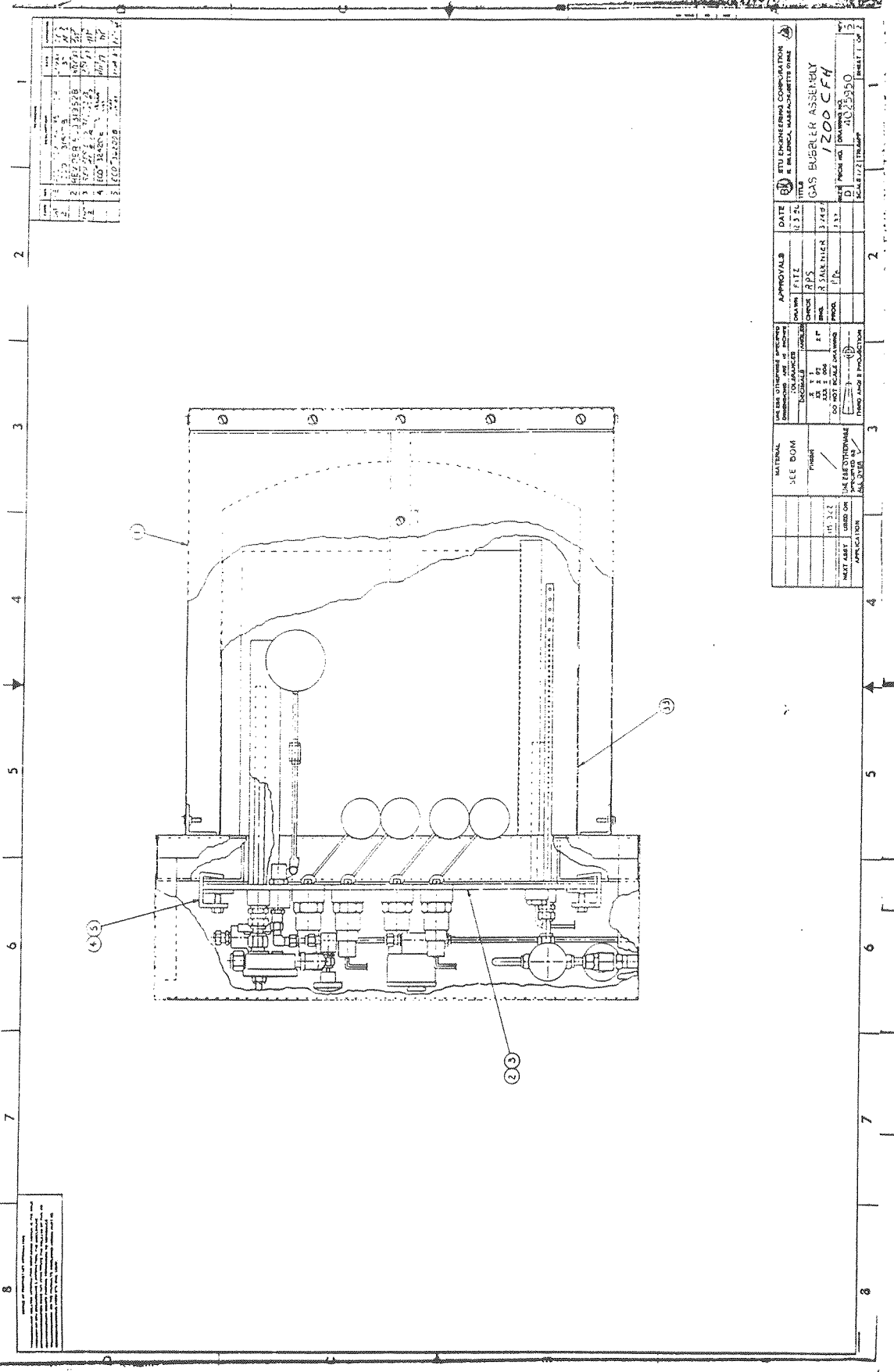
\*OMIT IF SINGLE T/C IS CALLED FOR



<b>GAS BUBBLER 600CFH</b> <b>WIRING DIAGRAM</b>	
ORDER NO. 4028329 DATE 11/21/50 BY L.B.333%	DRAWING NO. 4028329 SHEET 1 OF 1
REVISIONS:	
APPROVED BY:	CHECKED BY:

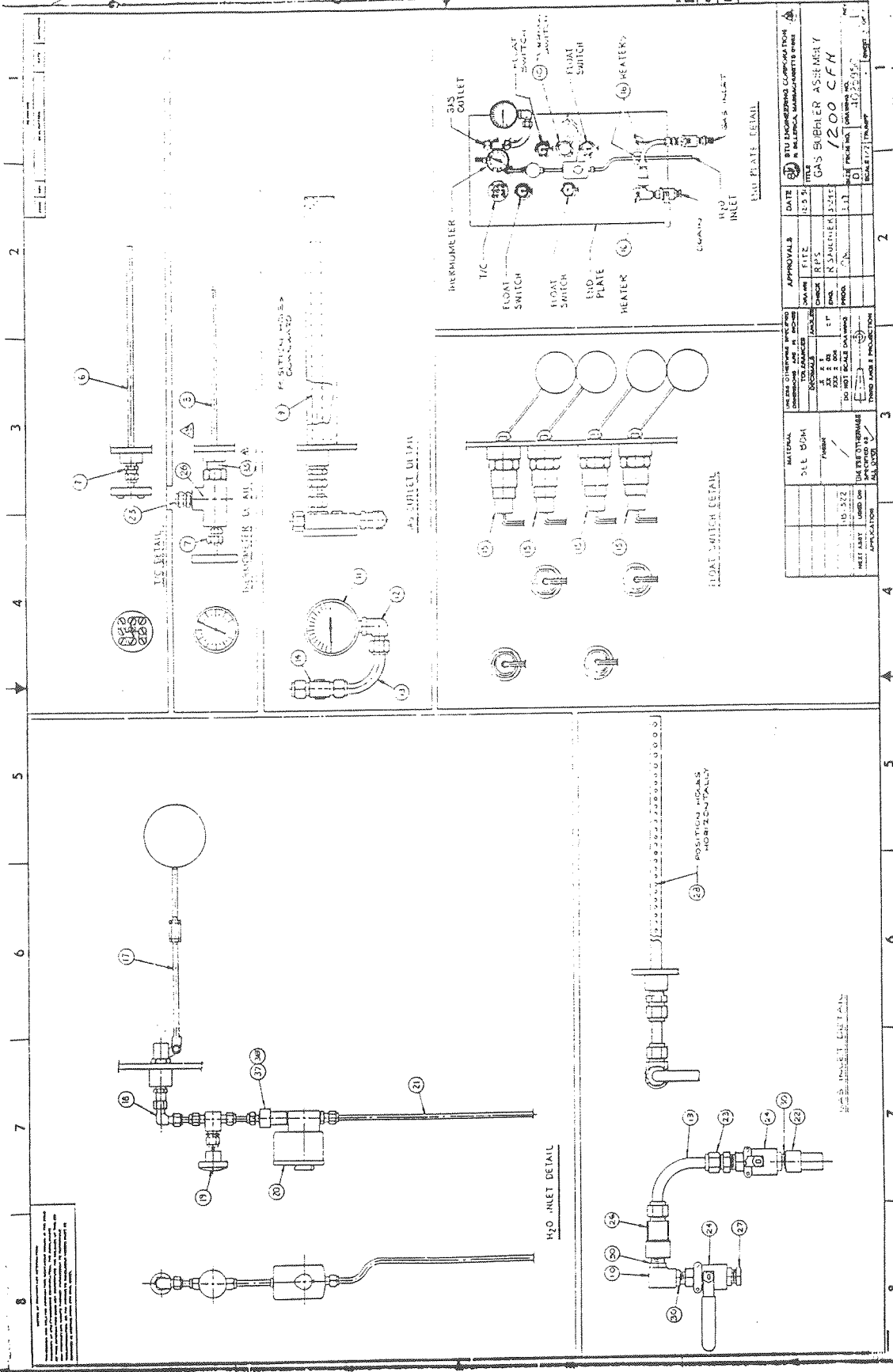
**MODEL 600 GAS SATURATOR PARTS LIST:** Assembly Part Number 4028300, Rev.1

PART NUMBER	DESCRIPTION	ITEM	QTY. PER ASSEMBLY	SC
4028301	WLDMNT TANK	1	1	M*
4028302	WLDMNT END	2	1	M*
4028303	BRKT PR GA	3	1	M*
8580305	VLV SOL 115	4	1	B
8889163	SCR PNH SST	5	20	F
8921161	WSHR FLT SS	6	20	F
8924162	WSHR LK SST	7	20	F
7740014	VLV MAN SST	8	1	B
4025951	SW THERM KI	9	1	B
8278014	HTR CRTG 1/	10	2	B
4025925	TC DUAL TYP	11	1	B
4025947	THERM 0-100	12	1	B
4025928	GA SST 0-15	13	1	B
6905001	INSL BULK F	14	20 LB	F
4028304	TB GAS EXHA	15	1	M*
4028324	FLG CLP ASS	16	2	X*
4028306	SHLD HALF	17	2	M*
4025911	VLV FL SST	18	1	B
4028307	TB GAS INLE	19	1	M*
4028308	GSKT SI RBB	20	1	M*
4028350	SW LIQ LVL	21	1	B
4028351	SW LIQ LVL	22	1	B
7742219	VLV BALL SS	23	1	B
8840121	NUT HEX ZNS	24	2	F
4027470	VLV CKH SST	25	1	B
7719555	FTG TB SST	26	1	B
7719442	FTG TB SST	27	1	B
4028309	CVR GAS BUB	28	1	M*
5003579	FTG TB SST	29	1	B
7719071	FTG TB SST	30	1	B
7719047	FTG TB SS T	31	2	B
4028323	FLG CLP ASS	32	2	X*
6230052	FTG TB SST	33	1	B
7719023	FTG TB SST	34	1	B
6508021	TB SST304 .	35	1.5 FT	F
6508061	TB SST304 .	36	1.5 FT	F
4028325	FTG PIPE SS	37	2	B
4028829	BRKT SOL VL	38	1	M*
7638773	FTG PIPE SS	39	1	B
7719797	FTG PIPE SS	40	1	B
7741028	VLV CHK SST	41	1	B
7719516	FTG TB SST	42	1	B
4027513	FTG TB SST	43	1	B
4028326	FTG TB SST	44	1	BB
8893043	SCR SHTMTL	45	10	F
4028327	ELEC KIT GA	46	1	M
7717086	FTG TB SST	47	1	B



NO.	REV.	DATE	BY	CHKD.	APP.	DESCRIPTION
1						ASSEMBLY
2						REVISED
3						REVISED
4						REVISED
5						REVISED

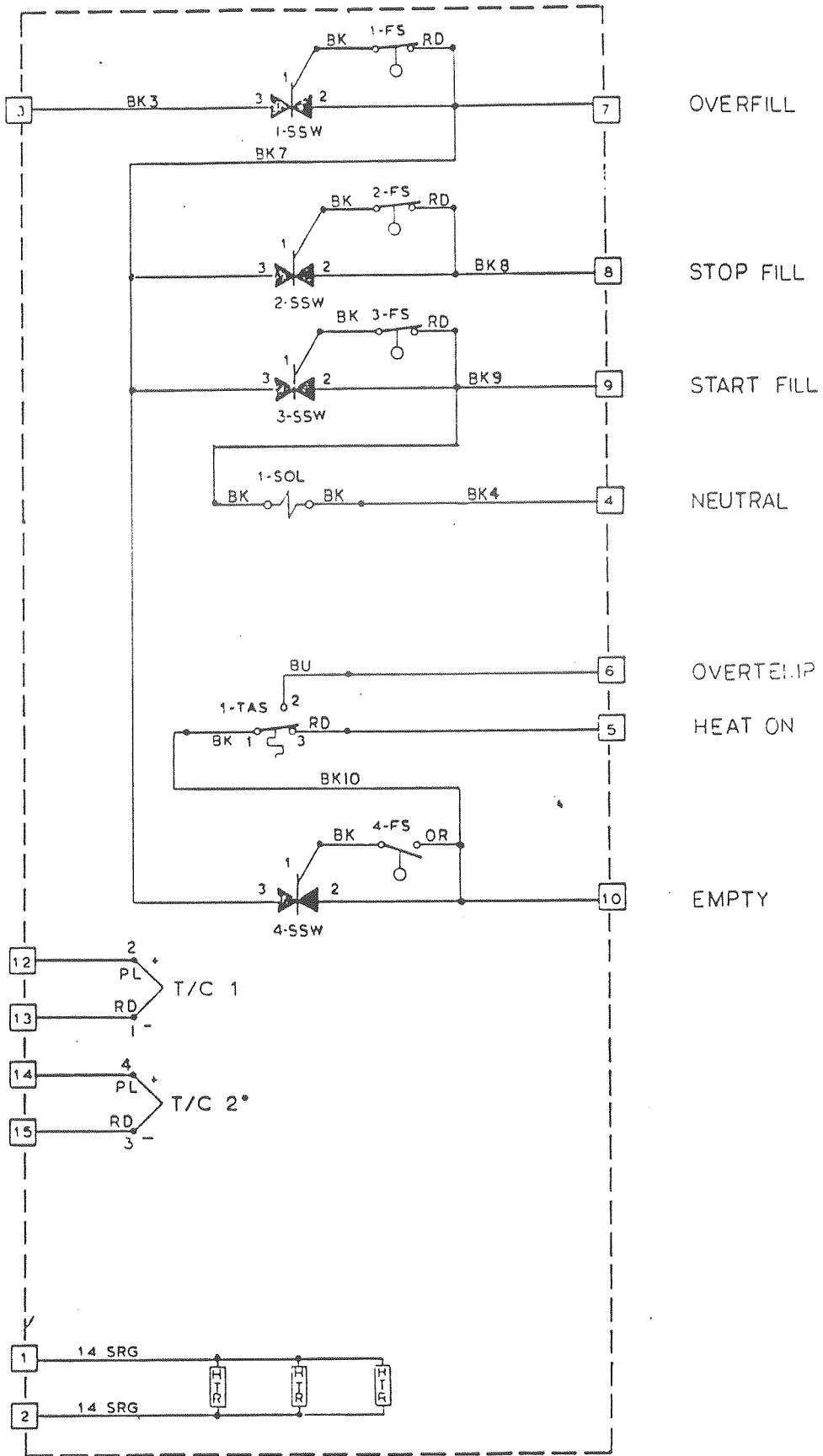
DATE U.S.S.		APPROVALS DESIGNED BY CHECKED BY DRAWN BY INSP. BY		MATERIAL SEE DDM		USE THIS DIMENSIONAL SYSTEM DIMENSIONS AND TOLERANCES UNLESS OTHERWISE SPECIFIED		DATE U.S.S.		TITLE GAS BUBBLER ASSEMBLY	
1700 CFH		JMS JPC		1700 CFH		1700 CFH		1700 CFH		1700 CFH	
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1. PREHEATER  
 2. TIC  
 3. FLOAT SWITCH  
 4. FLOAT SWITCH  
 5. END PLATE  
 6. HEATER  
 7. GAS INLET  
 8. GAS OUTLET  
 9. H<sub>2</sub>O INLET  
 10. O-RING  
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APPROVALS NAME TITLE CHECKED RPS DESIGNED R. SPALHEK DRAWN J. J. J. PROD. J. J. J.		DATE U.S.S. 1957	BTU LABORATORY CORPORATION 1000 W. 14th Street BOSTON, MASSACHUSETTS 02116
MATERIAL ALL COPR FINISH POLISH		DIMENSIONS ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED DECIMALS FRACTIONS TOLERANCES ± .010 ± .005 ± .002 ± .001 ± .0005 ± .0002 ± .0001	TITLE GAS BUBBLER ASSEMBLY QUANTITY 1200 CFM DRAWING NO. 10-222
DIMENSIONS ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED DECIMALS FRACTIONS TOLERANCES ± .010 ± .005 ± .002 ± .001 ± .0005 ± .0002 ± .0001		DATE U.S.S. 1957	BTU LABORATORY CORPORATION 1000 W. 14th Street BOSTON, MASSACHUSETTS 02116





\*OMIT IF SINGLE T/C IS CALLED FOR.

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GAS BUBBLER 1200CFH  
WIRING DIAGRAM

REVISED  
3/17/86  
FORM 310500  
9

**MODEL 1200 GAS SATURATOR PARTS LIST:** Assembly Part Number 4025950

MON, JAN 22, 1990

BILL OF MATERIALS

PAGE NO: 1

PART NUMBER	DESCRIPTION	QTY PER ITEM	ASSEMBLY	SC
4025936	SHLD ASSY G	1	1	M*
4025913	END PL G BU	2	1	M*
4025915	GSKT G BUBB	3	1	M*
4025945	FLG CLP ASS	4	2	X*
4025946	FLG CLP ASS	5	2	X*
4025925	TC DUAL TYP	6	1	B
4025926	FTG TB SS T	7	2	B
4025947	THERM 0-100	8	1	B
4025922	TB G XHST B	9	1	M*
7638254	FTG PIPE SS	10	1	B
4025928	GA SST 0-15	11	1	B
7719510	FTG TB SST	12	1	B
4026852	TB FORMED .	13	2	X*
6230083	FTG TB SST	14	1	B
8602208	SW LEVEL SS	15	4	B
8278014	HTR CRTG 1/	16	3	B
4025918	FLOAT VLV M	17	1	X*
7719442	FTG TB SST	18	1	B
7740014	VLV MAN SST	19	1	B
8580305	VLV SOL 115	20	1	B
6508021	TB SST304 .	21	1.5 FT	F
7719010	FTG TB SST	23	2	B
7742219	VLV BALL SS	24	2	B
4027513	FTG TB SST	26	2	B
7638134	FTG PIPE SS	27	1	B
4025923	TB G INLET	28	1	M*
4026146	ELEC KIT GA	29	1	M
7638773	FTG PIPE SS	30	3	B
4025951	SW THERM KI	31	1	B
4025938	WLDMNT TAND	33	1	M*
7719892	FTG TB SST	35	1	B
7741028	VLV CHK SST	37	1	B
7719058	FTG TB SST	38	1	B
1109505	BRKT SOLENO	39	2	M*
4026851	GAS SATURATOR 200		0	F2

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REVISIONS			
ZONE	REV	DESCRIPTION	DATE

FROM CONTROL CIRCUIT WIRING DIAGRAM 120VAC

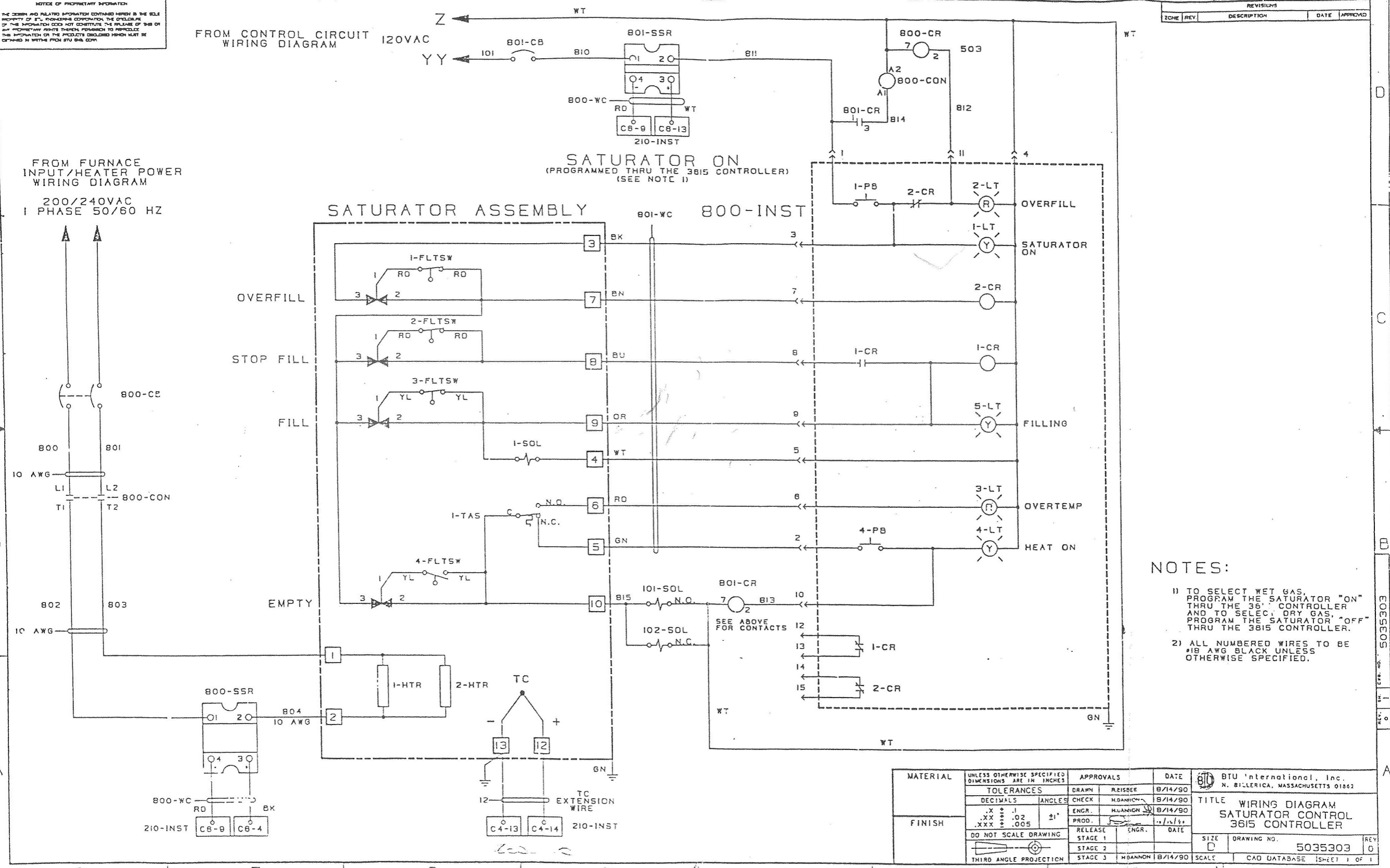
FROM FURNACE INPUT/HEATER POWER WIRING DIAGRAM

200/240VAC  
 1 PHASE 50/60 HZ

SATURATOR ON  
 (PROGRAMMED THRU THE 3815 CONTROLLER)  
 (SEE NOTE 1)

SATURATOR ASSEMBLY

800-INST



NOTES:

- TO SELECT WET GAS, PROGRAM THE SATURATOR "ON" THRU THE 3815 CONTROLLER AND TO SELECT DRY GAS, PROGRAM THE SATURATOR "OFF" THRU THE 3815 CONTROLLER.
- ALL NUMBERED WIRES TO BE #18 AWG BLACK UNLESS OTHERWISE SPECIFIED.

MATERIAL	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	APPROVALS	DATE	BTU International, Inc. N. BILLERICA, MASSACHUSETTS 01862
FINISH	TOLERANCES	DRAWN	REISBERG	8/14/90
	DECIMALS	CHECK	MDANNON	8/14/90
DO NOT SCALE DRAWING	THIRD ANGLE PROJECTION	ENGR.	MDANNON	8/14/90
		PROD.		
		RELEASE		
		STAGE 1	ENGR.	DATE
		STAGE 2	MDANNON	8/14/90
		STAGE 3		

TITLE	WIRING DIAGRAM	REV	0
	SATURATOR CONTROL		
	3815 CONTROLLER		
SIZE	D	DRAWING NO.	5035303
SCALE		CAD DATABASE	SHEET 1 OF 1

E05E505 REV. 0