

X-300
Revision 01

Model 300 Electronic Batch Controller/Totalizer

Operating and Maintenance Instructions



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WARNING

This instrument contains electronic components that are susceptible to damage by static electricity. Proper handling* procedures must be observed during the removal, installation, or other handling of internal circuit boards or devices.

***Handling Procedure:**

1. Power to unit must be removed.
2. Personnel must be grounded, via a wrist strap or other safe, suitable means, before any printed circuit card or other internal device is installed, removed or adjusted.
3. Printed circuit cards must be transported in a conductive bag or other conductive container. Boards must not be removed from protective enclosure until the immediate time of installation. Removed boards must be placed immediately in protective container for transport, storage, or return to factory.

Comments

This instrument is not unique in its content of ESD (electrostatic discharge) sensitive components. Most modern electronic designs contain components that utilize metal oxide technology (NMOS, CMOS; etc.). Experience has proven that even small amounts of static electricity can damage or destroy these devices. Damaged components, even though they appear to function properly, exhibit early failure.

The original printed diagram shown on page 7, Figure 2-2 indicating COM-1 to be TB2-21 is INCORRECT. Correct labeling should be TB1-21.

The reverse side of this document has been printed to replace existing data. Please attach this addendum to the appropriate page so as to avoid any confusion that may occur due to this error.

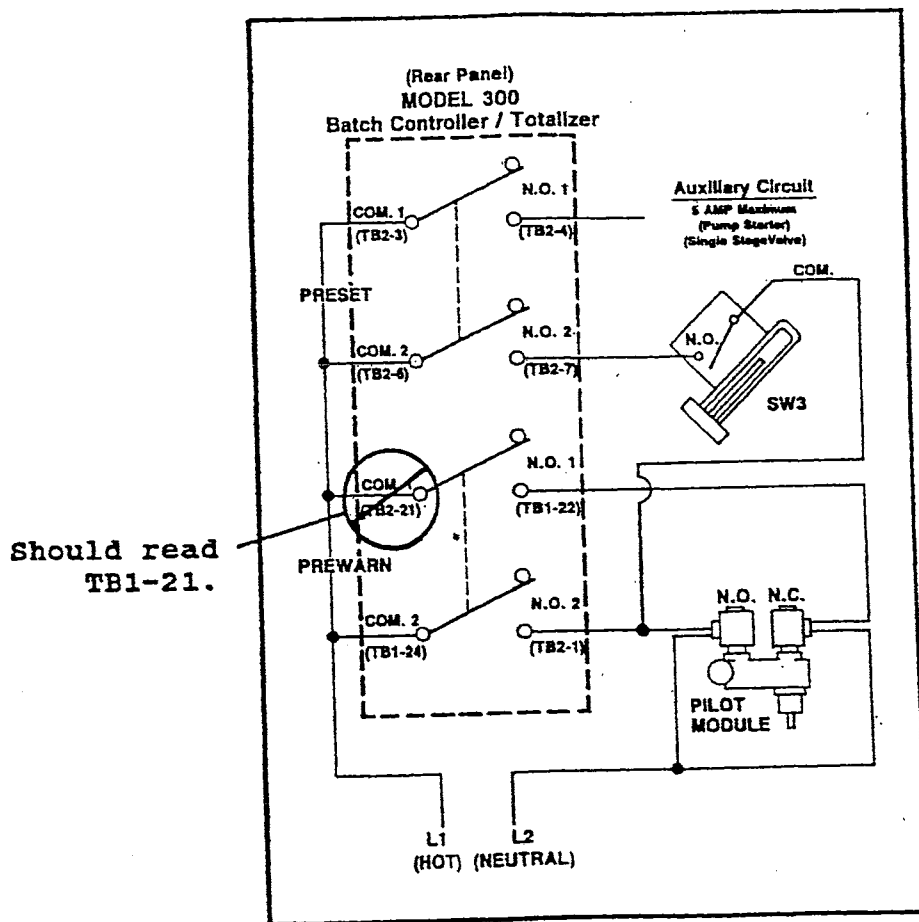


Figure 2-2 Two-Stage Valve Wiring Hook-up Diagram

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SECTION 1 INTRODUCTION

1-1 General Description

The Brodie Model 300 Two-Stage Electronic Batch Controller is a microprocessor-based panel-mounted instrument designed to be used in conjunction with primary flow sensors which have a pulse or contact-closure output. The main function of the unit is to provide indication and control of process batch size.

1-2 Principle Of Operation

The Model 300 factors input pulses into engineering units and provides two control outputs at adjustable set points. The control output consists of 2 DPDT, 115/230 Vac, 5 amp relay contacts. One contact actuates at prewarn (first stage). The second contact actuates at preset complete or end of batch. In addition to the control outputs, the Model 300 also provides a scaled output and a buffered (unfactored) output to drive other remote indicating devices. Output voltages of 12 volts grounded and 12 volts isolated are provided to power external sensors and other peripheral devices. Both local and remote start-stop-reset functions are provided. Selection of counter configurations (reset to zero, set to preset, inventory totalization) as well as input scaling, preset levels, decimal point locations, software selectable debounce settings and special security numbers are entered on the sealed, front keypad by following the displayed instructions.

1-3 Specifications

ACCURACY

± 1 Count

MODE OF OPERATION

Single or two-stage controller, totalizer

HOUSING

High impact plastic case with moisture resistant front panel.

DIMENSIONS

Reference Figure 1-1.

POWER REQUIREMENTS:

Model 300-00-000-00: 115 Vac ± 15% 50/60 Hz or 12 to 24 Vdc ± 10%

Model 300-00-000-01: 230 Vac ± 15% 50/60 Hz or 12 to 24 Vdc ± 10%

NOTE: When dc power is used, no dc outputs are available.

OPERATING TEMPERATURE:

+32° to +131° F (0° to +55° C)

STORAGE TEMPERATURE:

-40° to +158° F (-40° to +70° C)

FRONT PANEL CONTROLS (Reference Figure 1-2)

Indication: 8-character, alphanumeric LED's
Programmable decimal point location

Data Entry: 12-button numeric key pad.

Controls: 4 multi-function push buttons

The run mode includes separate buttons for START, STOP, RESET and MENU.

Remote START, STOP and RESET are rear terminal connections.

SCALING

K-factor is a 4-digit number entered by scientific notation. The incoming pulses are divided by this K-factor to obtain the scaled quantity for display or output.

RANGE OF K-FACTOR SELECTION

0.100 E0 to (E0 equaling 10⁰ or 1)

9.999 E5 inclusive (E5 equaling 10⁵ or 100,000)

Total K-Factor Range: 0.100 to 999, 900

Entry of K-factor is accomplished and illustrated in the following examples:

Example 1: Meter K-factor is 386.3

Enter: 3.863; E2 (E2 = 10² or 100)

Example 2: Meter K-factor is 23.91

Enter: 2.391 E1 (E1 = 10¹ or 10)

Example 3: Meter K-factor is 1969.1

Enter: 1.969 E3 (E3 = 10³ or 1,000)

INPUT SIGNALS

Pulse:

0 to 20 kHz (for K-factors greater than 1.0); minimum pulse width 3 microseconds.

V_L 0 to 1.0 Vdc; V_H 3.0 to 30.0 Vdc

For K-factors less than 1.0, Input Frequency = 20,000 X K-factor

Contact Closure:

0 to 400 Hz internal switch, debounce keypad selectable.

OUTPUT SIGNALS

Auxiliary Power:

12 Vdc ± 5% regulated, 100 mA (not available when operated with dc power)

Isolated 12 Vdc, 100 mA (not available when operated with dc power)

Relays:

2 DPDT - one for PRESET and one for PREWARN. (115/230 Vac 5A contact ratings)

Remote START, STOP, RESET

3-30 Vdc (active high)

Open Collector:

One each scaled (frequency same as indicator batch count)

One each unscaled (same as input frequency)

Both outputs sink up to 100 mA at 30V

EXTERNAL CONNECTIONS

All power, input and output connections are rear panel terminals.

DATA RETENTION

Data is stored in EEPROM memory

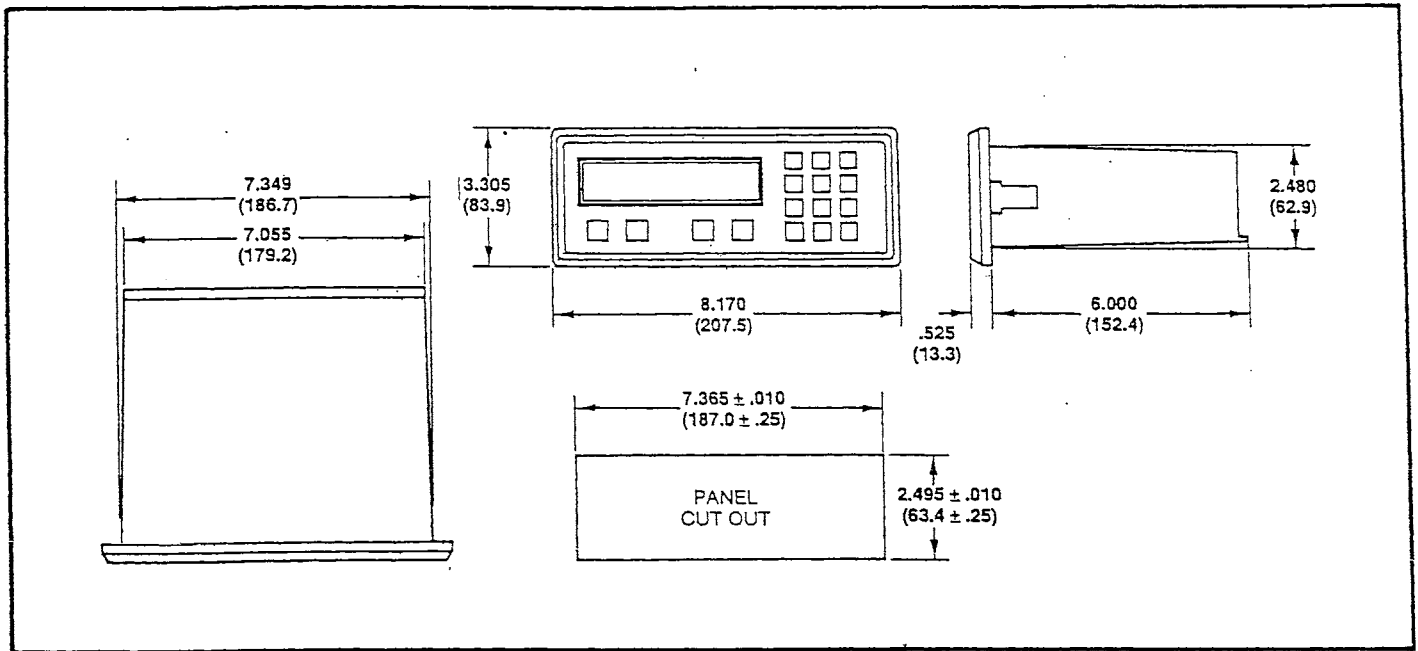


Figure 1-1 Model 300 Dimensions (For Certified Prints Consult Factory)

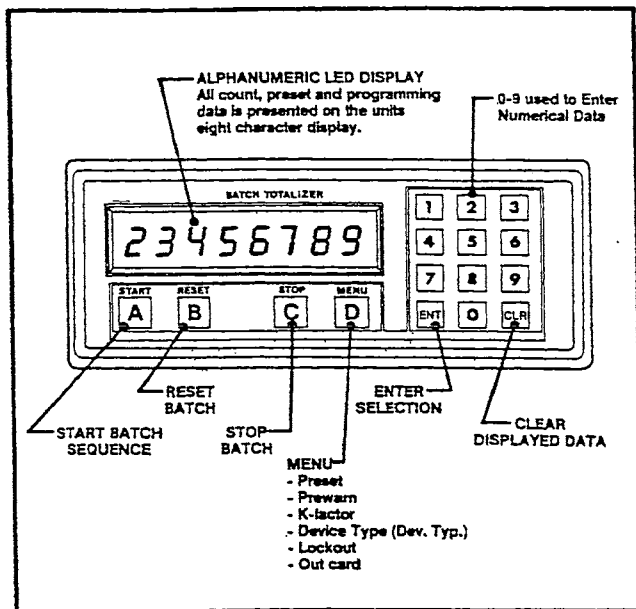


Figure 1-2 Keypad and Front Panel Functions

SECTION 2 INSTALLATION

2-1 Receipt of Equipment

When the equipment is received, the outside packing case should be checked for any damage incurred during shipment. If the packing case is damaged, the local carrier should be notified at once regarding his liability. A report should be submitted to

Brodie Meter Co., LLC
P.O. Box 450
Statesboro, GA 30459

Remove the envelope containing the shipping list and the Installation and Operation Instructions. Carefully remove the equipment from the packing case and inspect for damaged or missing parts.

2-2 Return Shipment

Do not return assembly or part without a Return Material Report. The Return Material Report is available from all District Sales Offices and Product Service Department, Statesboro, Georgia. Information describing the problem, corrective action, if any, and the work to be accomplished at the factory must be included.

2-3 Panel Mounting

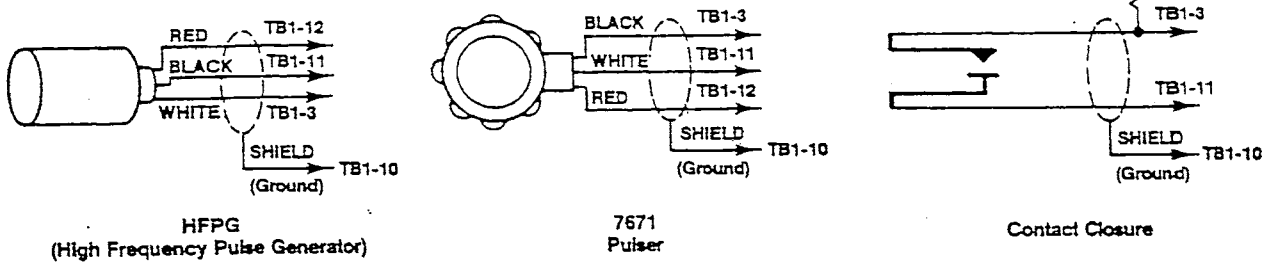
The controller should be located in an area with a clean, dry atmosphere which is relatively free of shock and vibration. The Model 300 is installed in a 7.365" (187.0MM) wide by 2.495" (63.4MM) high-panel cutout. To panel mount the controller proceed as follows:

- Prepare the panel opening.
- Slip the gasket (provided) over the rear of the counter case and slide it forward until it engages the inner surface of the front bezel.
- Install the screws (provided) in the mounting brackets and insert in the holes located on both sides of the counter.
- Tighten the screws firmly to attach the counter bezel to the panel.

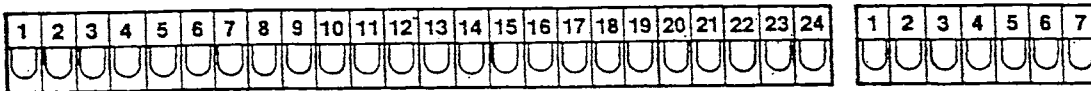
2-4 Electrical Connections (Reference Figures 2-1, 2-2, 2-3, and 2-4)

All connections to the controller are completed at terminal strips located at the rear of the case as indicated in the external wiring diagram. Make sure all power is disconnected before making any electrical connections. In cases where cables are situated in areas with heavy electrical fields, shielding is required for maximum noise immunity. One end of the shielding should be connected to earth ground.

TYPICAL WIRING CONNECTIONS



UNIT TERMINAL CONNECTIONS



- | | |
|------------------|-------------------------------|
| 1. START INPUT | 13. DC POWER IN |
| 2. GROUND | 14. ISOLATED -12 VOLTS OUT |
| 3. COUNT INPUT | 15. ISOLATED +12 VOLTS OUT |
| 4. RESET INPUT | 16. AC GROUND |
| 5. STOP INPUT | 17. AC INPUT |
| 6. SCALED OUTPUT | 18. AC INPUT |
| 7. BUFFER OUTPUT | 19. NO CONNECTION |
| 8. NOT USED | 20. PREWARN NORMALLY CLOSED 1 |
| 9. GROUND | 21. PREWARN COMMON 1 |
| 10. GROUND | 22. PREWARN NORMALLY OPEN 1 |
| 11. GROUND | 23. PREWARN NORMALLY CLOSED 2 |
| 12. 12 VOLTS OUT | 24. PREWARN COMMON 2 |

- | |
|-----------------------------|
| 1. PREWARN NORMALLY OPEN 2 |
| 2. PRESET NORMALLY CLOSED 1 |
| 3. PRESET COMMON 1 |
| 4. PRESET NORMALLY OPEN 1 |
| 5. PRESET NORMALLY CLOSED 2 |
| 6. PRESET COMMON 2 |
| 7. PRESET NORMALLY OPEN 2 |

REMOTE INPUTS:

The remote inputs START, STOP, and RESET will all take 3-30 volt input with a pulse width of 1 millisecond minimum.

OUTPUTS:

Both scaled and buffered (unscaled) output are open collector, therefore require a pull up resistor. Typically 1 K OHM.

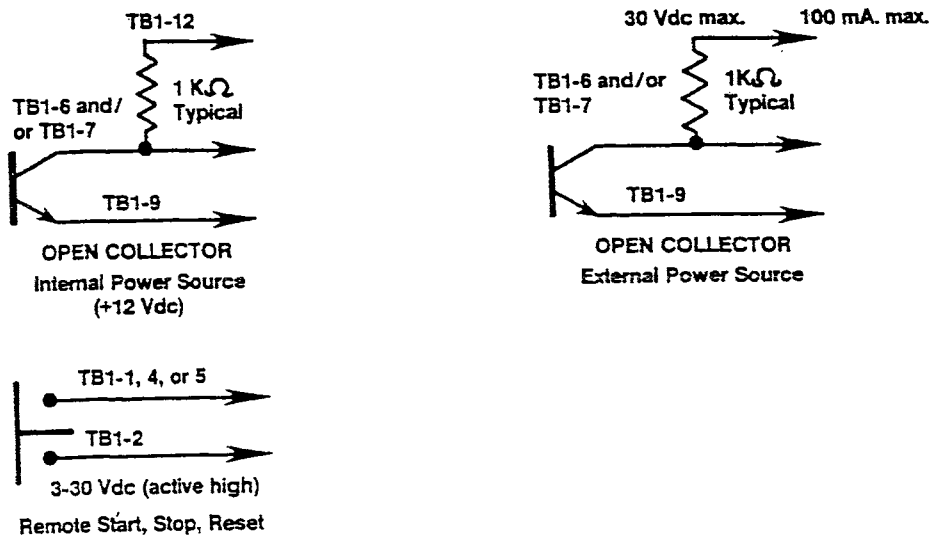


Figure 2- Typical Wiring Connections and Unit Terminal Connections

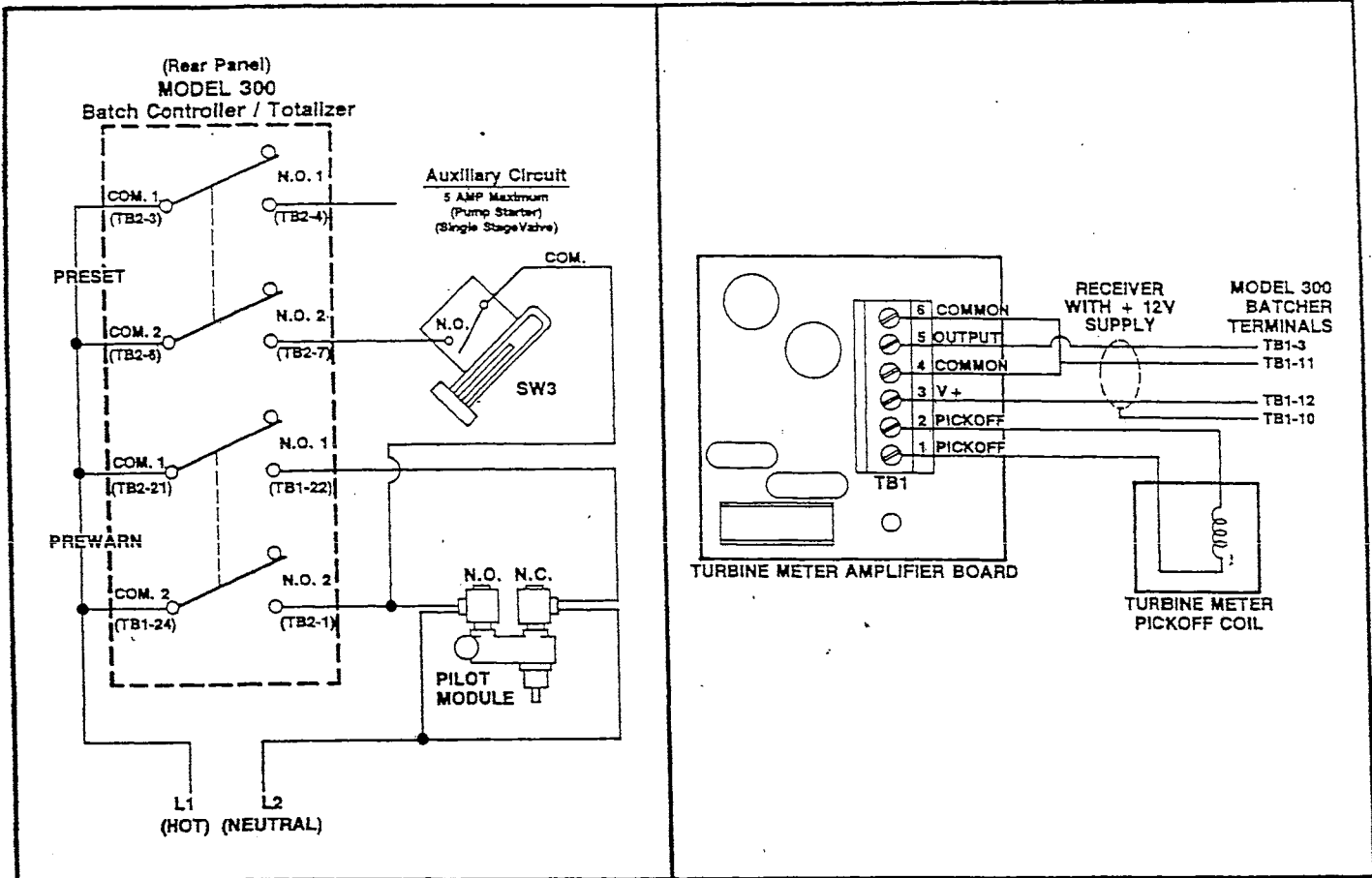


Figure 2-2 Two-Stage Valve Wiring Hook-up Diagram

Figure 2-3 Typical Wiring Hook-up Diagram

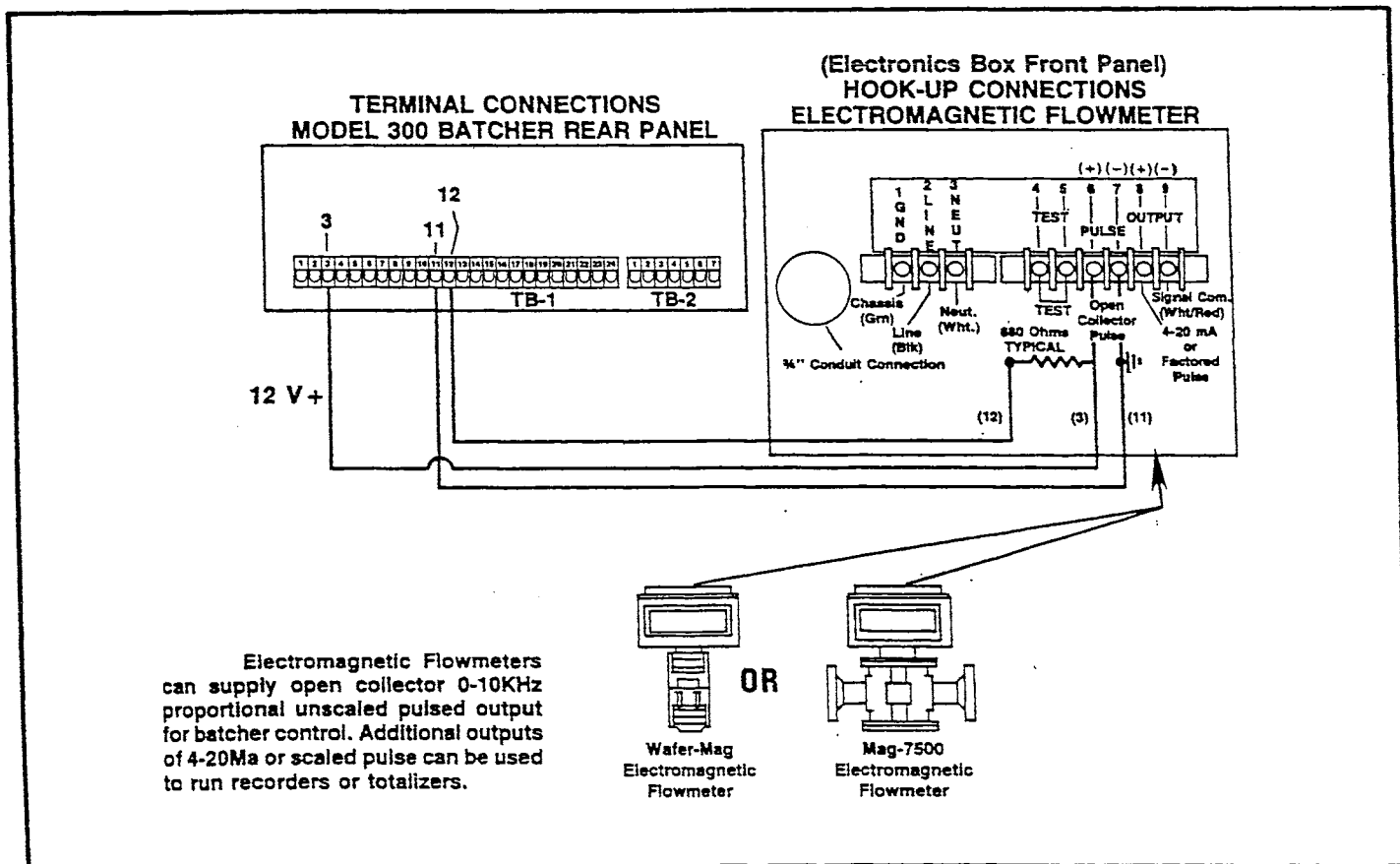


Figure 2-4 Typical Wiring Hook-up Diagram

SECTION 3 OPERATION

3-1 Programming

A. Menu (Button D)

The Menu section is the area of the batch controller's programming where control points or parameters for operation are set. In order, the control parameters that are available within the menu section are; PRESET, PREWARN, K-FACTOR, DEVICE TYPE (DEV TYP), LOCKOUT and OUTCARD.

PRESET

Menu Control Parameter I is the location in the batch controller's programming where the batch amount is set into the unit.

PREWARN

Menu Control Parameter II is the location in the batch controller's programming where the low flow shut down quantity (first stage trip quantity) is set into the unit.

K-FACTOR

Menu Control Parameter III is the location in the batch controller's programming where the number of counts per unit volume produced by the flow meter are scaled for display or output.

DEVICE TYPE (DEV TYP)

Menu Control Parameter IV is the location in the batch controller's programming where the preset mode is configured, the decimal point location is set, and switch debounce settings are entered.

LOCKOUT

Menu Control Parameter V is the security parameter of the unit. The lockout feature enables the operator to shut-off selected features of the batch controller to the general user of the equipment.

NOTE: The Outcard control parameter is included in the batch controller's software for the future addition of communications cards for two-way communication. Although this feature is included in the batcher's software, the communications option is not available at this time.

The initial programming of the unit is accomplished by first depressing the MENU button. After pressing the MENU button once, the display will read "PRESET". To cycle to the next control parameter option, merely press the MENU button and "PREWARN" will appear on the display. If the user does not wish to choose this section of the menu, depress MENU button again and the next control/parameter will appear.

Selection of all MENU control parameters is accomplished through the routine described for PRESET and PREWARN.

B. Preset - Menu Control Parameter I

When PRESET is selected, depress the ENTER (ENT) button, and the unit will show the value that is currently entered in the unit and the display will flash to indicate this is not the batch amount. If the operator does not wish to change this value, depress the ENTER (ENT) button and this value will be saved. To change the preset value, depress

the CLEAR (CLR) button and enter the new number. When the display holds the desired preset value, depress the ENTER (ENT) button. At this point the new data is entered into the batch controller and stored in non-volatile memory. Simultaneously, the batcher will return to the run mode.

NOTE: Within DEVICE TYPE (DEV TYP) - Menu Control Parameter IV - There are two ways to configure the PRESET:

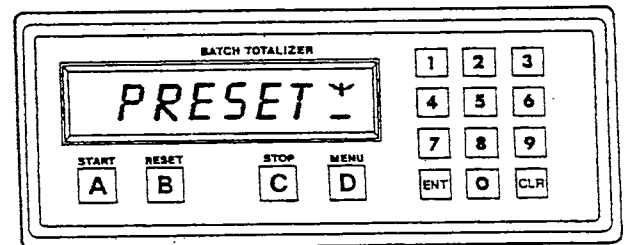
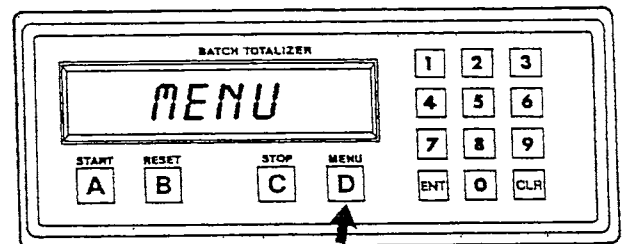
- I. Set to the preset value. Designated in this manner **SP R0**.
- II. Reset to "0" zero. Designated **SP R0**

When SP is selected in DEV TYP, Menu Control Parameter IV, the described procedure for setting batch size needs only to be set once or until a change in batch size is required.

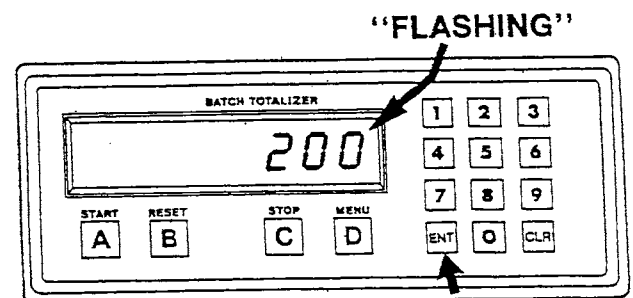
When R0 is selected at DEV TYP, the described procedure must precede each batch, i.e. a new preset amount must be entered prior to starting a batch.

Following is the entry sequence for a preset quantity.

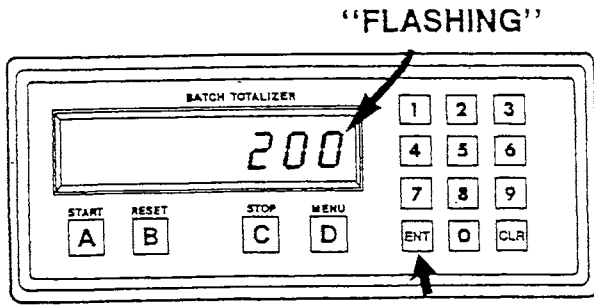
1. Depress the MENU ("D") button once. The display will read "MENU". After a one-second pause the display will read "PRESET".



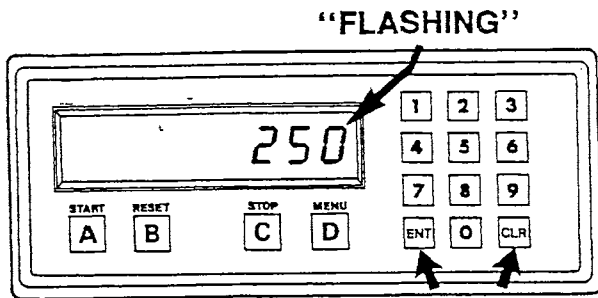
2. Depress the ENTER (ENT) button; display will flash to indicate this is not the batch quantity.



3. If batch size is satisfactory, depress the ENTER (ENT) button. This value will be entered into memory. Simultaneously, the unit will return to the run mode.



4. To change the preset value, depress the CLEAR (CLR) button and enter new number. Example "250", New Batch Size.



When the display holds the desired value, depress the ENTER (ENT) button. The new batch size will be stored in memory and simultaneously the batcher will return to the run mode.

C. Prewarn - Menu Control Parameter II

When PREWARN is selected, depress the ENTER (ENT) button and the unit will display the amount at which the unit will initiate low flow operation. This value will flash at one second intervals to indicate it is not the batch amount. In the event the operator does not wish to change the value on the display, depress the ENTER (ENT) button and the value is restored to memory. Should the user wish to change this value, press the CLEAR (CLR) button and enter the desired value. When the display holds the proper value, depress the ENTER (ENT) button. At this point the new data is entered into the batch controller and stored in non-volatile memory. Simultaneously, the batcher will return to the run mode.

D. K-factor - Menu Control Parameter III

Scaling is accomplished in the Series 300 by entering the four most significant digits of the K-factor. For entry of the K-factor, the **decimal point location is fixed**. Therefore, an order of magnitude is assigned to this number to change the decimal point location. The incoming pulses are divided by this K-factor to obtain the scaled quantity for display or output

Arithmetically.

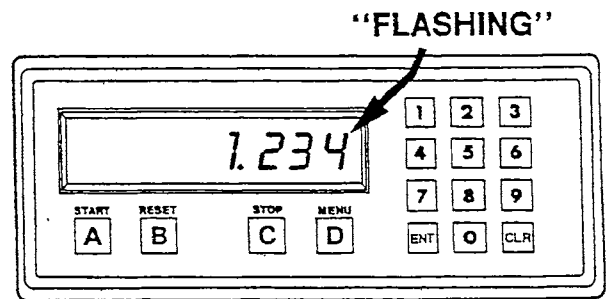
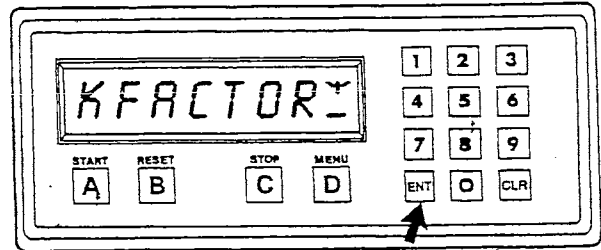
Example: K-factor is 386.3
 Enter 3.863 E2 ($E2=10^2=100$)
 $3.863 \times 100 = 386.3$
 386.3

K-factor 386.3 = 1 Scaled Unit

Following are step-by-step instructions for entry of K-factor.

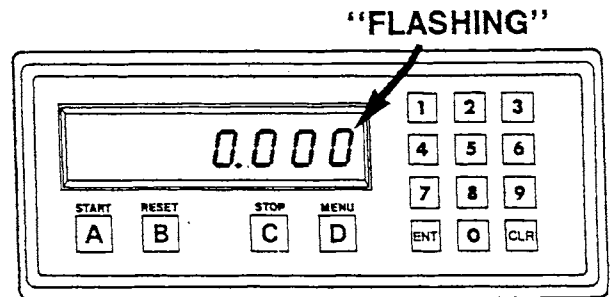
Example: K-factor is 386.3

When K-factor is selected, depress the ENTER (ENT) button. The operator will see the K-factor that is currently set into the unit. The display will flash once per second to indicate this is the current K-factor setting and not the batch amount.

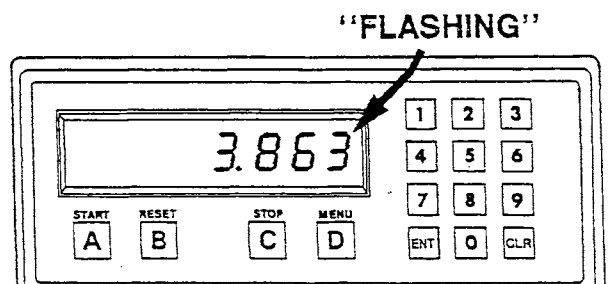


The unit displays a 4-digit number. This number represents the four most significant digits of the K-factor.

Should the operator wish to change this value, depress the CLEAR (CLR) button. The display will flash all zeroes indicating the old K-factor is cleared from the batcher.

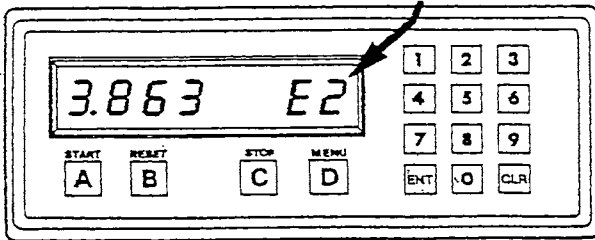


Enter the new K-factor utilizing the keypad. In this example 3863. The new K-factor will be displayed on the unit in the following manner:



Once the proper data is in the display, depress the ENTER (ENT) button. At this point, the display will show the order of magnitude assigned to the K-factor.

"FLASHING"



For this example the unit should read 3.863 E2 (Reference Table 3-1, Truth Table, Equivalent Powers of "E")

To change the order of magnitude of the K-factor, depress any number from 0 to 5. When the proper data is in the display window, depress the ENTER (ENT) button to save the data in memory. Simultaneously, the batcher will return to the run mode.

NOTE: If a K-factor that is less than 0.100 is entered, the error message "TOO SMALL" will appear on the display.

If the LOCKOUT is on, the user may view the K-factor setting but cannot alter the information.

Table 3-1 Truth Table, Equivalent Powers of "E"

E0	=	10 ⁰	=	1
E1	=	10 ¹	=	10
E2	=	10 ²	=	100
E3	=	10 ³	=	1,000
E4	=	10 ⁴	=	10,000
E5	=	10 ⁵	=	100,000

Examples 1 through 5 provide a convenient method for determining the appropriate factor setting in Control Parameter III. Likewise, these examples show the proper decimal location for batcher display.

Example #1

K-factor (Pulses per Unit Volume)	+	Required Pulses Per unit volume	=	Scale Factor	Power Of "E"	Key In	Display Will Read	Decimal Location	Factored Pulse Output Per Unit Volume
2163	+	1	=	2163.	2 1 6 3. ↑ ↑ ↑ 3 2 1	2.163 E3	Whole Units	00000000.	1
2163	+	10	=	216.3	2 1 6 3 ↑ ↑ 2 1	2.163 E2	1/10 Units	0000000.0	10
2163	+	100	=	21.63	2 1 .6 3 ↑ 1	2.163 E1	1/100 Units	000000.00	100
2163	+	0.1	=	21630.	2 1 6 3 0. ↑ ↑ ↑ ↑ 4 3 2 1	2.163 E4	Units X 10	00000000.	0.1
2163	+	0.01	=	216300.	2 1 6 3 3 0. ↑ ↑ ↑ ↑ ↑ 5 4 3 2 1	2.163 E5	Units X 100	00000000.	0.01

Example #2

K-factor (Pulses per Unit Volume)	+	Required Pulses Per unit volume	=	Scale Factor	Power Of "E"	Key In	Display Will Read	Decimal Location	Factored Pulse Output Per Unit Volume
175	+	1	=	175.	1 7 5. ↑ ↑ ↑ 3 2 1	0.175 E3	Whole Units	00000000.	1
175	+	10	=	17.5	1 7 5 ↑ ↑ 2 1	0.175 E2	1/10 Units	0000000.0	10
175	+	100	=	1.75	1 .7 5 ↑ 1	0.175 E1	1/100 Units	000000.00	100
175	+	0.1	=	1750.	1 7 5 0. ↑ ↑ ↑ ↑ 3 2 1	1.750 E3	Units X 10	00000000.	0.1
175	+	0.01	=	17,500.	1 7 5 0 0. ↑ ↑ ↑ ↑ ↑ 4 3 2 1	1.750 E4	Units X 100	00000000.	0.01

Example #3

K-factor (Pulses per Unit Volume)	+	Required Pulses Per unit volume	=	Scale Factor	Power Of "E"	Key In	Display Will Read	Decimal Location	Factored Pulse Output Per Unit Volume
49	+	1	=	49.	0 4 9. ↑ ↑ ↑ 3 2 1	0.049 E3	Whole Units	00000000. ↑	1
49	+	10	=	4.9	0 4 9. ↑ ↑ 2 1	0.049 E2	1/10 Units	0000000.0 ↑	10
49	+	100	=	0.49	0 .49 ↑	0.049 E1	1/100 Units	000000.00 ↑	100
49	+	0.1	=	490.	4 9 0. ↑ ↑ ↑ 3 2 1	0.490 E3	Units X 10	00000000. ↑	0.1
49	+	0.01	=	4900.	4 9 0 0. ↑ ↑ ↑ 3 2 1	4.900 E3	Units X 100	00000000. ↑	0.01

Example #4

K-factor (Pulses per Unit Volume)	+	Required Pulses Per unit volume	=	Scale Factor	Power Of "E"	Key In	Display Will Read	Decimal Location	Factored Pulse Output Per Unit Volume
1	+	1	=	1.	1.	1.000 E0	Whole Units	00000000. ↑	1

Example #5

K-factor (Pulses per Unit Volume)	+	Required Pulses Per unit volume	=	Scale Factor	Power Of "E"	Key In	Display Will Read	Decimal Location	Factored Pulse Output Per Unit Volume
43987	+	1	=	43987.	4 3 9 8 7 ↑ ↑ ↑ ↑ 4 3 2 1	4.399 E4	Whole Units	00000000. ↑	1
43987	+	10	=	4398.7	4 3 9 8.7 ↑ ↑ ↑ 3 2 1	4.399 E3	1/10 Units	0000000.0 ↑	10
43987	+	100	=	439.87	4 3 9.87 ↑ ↑ 2 1	4.399 E2	1/100 Units	000000.00 ↑	100
43987	+	0.1	=	439870.	4 3 9 8 7 0. ↑ ↑ ↑ ↑ ↑ 5 4 3 2 1	4.399 E5	Units X 10	00000000. ↑	0.1

E. Device Type (DEV TYP) - Menu Control Parameter IV

When the DEV TYP parameter is selected, depress the ENTER (ENT) button. The display will read: SP R0. If SP is selected, the device will return the batch counter to zero but the preset quantity will be retained when the reset function is initiated. If R0 is selected, the device will clear the preset quantity to zero when the reset button is actuated. The operator must enter a new preset amount before starting the next batch. The prewarn quantity is not cleared when the reset button is actuated.

In order to select between SP (Set to Preset) or R0 (Reset to Zero), the operator pushes button "B" (RESET) OR "D" (MENU). A bar under the arrow indicates the configuration for the unit that has been selected.

Once the desired unit configuration has been selected, the operator presses the ENTER (ENT) button. At this point, the unit will prompt the user for setting the location of the decimal point. The decimal point is moved by pressing any number from 0 to 8 with 0 (zero) indicating no decimal point location, 8 indicating a decimal point location to the far left of the display. Once the location of the decimal point is determined, press the ENTER (ENT) button to lock this information into the unit. The next programming function within the DEV TYP routine is the setting of switch Debounce information into the counter. Once the Debounce message leaves the display screen, it will be replaced by the letters CNT and a debounce time. CNT stands for the count input. The debounce time is the minimum time needed to see a pulse.

Table 3-2 Count Input Debounce Settings

Count Input	Select
100 Hz Maximum	5 Milliseconds
8 KHz Maximum	61 Microseconds
20 KHz Maximum	3 Microseconds

Note: For start, stop and reset debounce settings, the 5 millisecond setting is recommended when operating with mechanical switches. Either the 61 microsecond or 3 microsecond setting is recommended when operating with electronic switches.

The debounce time is changed by pressing the "D" (MENU) button until the desired debounce time is displayed. The debounce selection choices are 5 milliseconds, 61 microseconds, or 3 microseconds. At this time the ENTER (ENT) button is depressed locking the data into the unit.

Start Input Debounce Time

This is the second debounce setting for the batcher. The unit will display the letters "STRT" and the debounce time. This data is altered by depressing the D (MENU) button until the desired debounce time is displayed in the window. The ENTER (ENT) button is depressed and the data is entered into the unit.

Stop Input Debounce Time

The third debounce setting is STOP INPUT DEBOUNCE TIME. The unit will prompt the operator with letters "STOP" and a debounce time. Select the debounce time that is needed for the external stop input. Again, the debounce data is altered by pressing the "D" (MENU) button and is entered by pressing the ENTER (ENT) button.

External Reset Input

The fourth and last debounce setting is for EXTERNAL RESET INPUT. The unit will display "RST" and a debounce time. Debounce settings can be changed by pressing the "D" (MENU) button. Entry of desired debounce time is accomplished by depressing the ENTER (ENT) button.

At this point the unit will return to the run mode. The external Start, Stop, and Reset inputs require 1 millisecond pulse to insure acceptance.

NOTE: If the lockout is on, DEV TYP information may be viewed; however, changes cannot be made.

Each time a menu control parameter is "entered," the unit will return to the run mode.

F. Lockout - Menu Control Parameter V

When the lockout parameter is selected, depress the ENTER (ENT) button. The display will show the lockout code that is set into the unit. This code can be any 4-digit number desired by the operator. If the operator does not wish to change this value, depress the ENTER (ENT) button and the unit will return to the Run Mode. If the operator wishes to change this value, the CLEAR (CLR) button is depressed, a new 4-digit code keyed in

and the value stored in memory by depressing the ENTER (ENT) button.

The LOCK ON or LOCK OFF mode of operation is controlled by entry of the 4-digit code.

For example:

The 4-digit code is 7777. Lockout is in the Lock On state.

To change Lockout status to Lock Off:

Enter: 7777 - "Lock off" will appear on the display for 1 second.

NOTE: Lockout status may be changed any time the unit is in the run mode.

The Lockout feature enables the operator to shut off selected features of the batch controller to the general user of the equipment. When the 4-digit code is set into the unit, the unit will respond with one of two statements, Lock-On or Lock-Off. If the lock is "ON" the user will have limited access from the front key pad. The START ("A" button), RESET ("B" button) and STOP ("C" button) are unaffected by the lock. However, the user will have limited access to the MENU ("D" button).

The user will continue to have the ability to set in preset values. The other set points of the unit may be verified, but not altered. The totalizing counter will be able to be displayed; however, in order to reset the counter, the lock must be off. When the lock is off, any user will have full access to all functions. When the lockout code is on, this control parameter will not be displayed in the menu.

Model 300 batch controllers are shipped from the factory with the lockout in the "off" position.

Section 3-2 Recommended Programming Sequence

The initial programming of the Model 300 Batch Controller is critical to the satisfactory operation of the unit. Following, in order, are the recommended steps for the initial programming of the Model 300 Batcher.

1. Program into the unit the required K-factor Setting. (Menu Control Parameter III "K-factor")
2. Program into the unit the correct Decimal Point Location. (Menu Control Parameter IV "Device Type")
3. Program into the unit the desired Prewarn Setting. (Menu Control Parameter II "Prewarn")
4. Program into the unit the Preset Mode to be used. "Set to Preset" (SP) or "Reset to Zero" (R0). (Menu Control Parameter IV "Device Type")
5. Program into the unit the appropriate Debounce information. (Menu Control Parameter IV "Device Type")
6. Program into the unit a four digit Security Code. (Menu Control Parameter V "Lockout")
7. Reset the totalizer counter to zero. (See Section 3-5 Totalizer Counter).
8. Set the security lockout to the "ON" position.
9. Program into the unit the desired preset batch amount. (Menu Control Parameter I "Preset")

At this point, the unit is programmed to start a batch delivery.

3-6 Start ("A" Button)

This command is used to initiate the batch sequence. There are two ways of giving the Start command. The first is to push button "A" (START) on the front panel. The second is to use the remote START input on the rear terminal block.

Once the unit is started, the display will prompt the operator with the word "STARTED" to indicate the unit has received the command and is carrying it out.

The unit will engage both relays unless the prewarn relay set point has already been attained. The relays will remain engaged until the predetermined set points are reached. Once the set points are attained for PREWARN and PRESET, the relays will disengage.

NOTE: Once both PREWARN and PRESET set points are reached, the unit cannot be started until it receives a reset command.

Once the unit is started, all buttons are locked out from use except the STOP button and the ENTER (ENT) button which allows access to the totalizing counter.

3-7 Reset ("B" Button)

This command is used when the unit is stopped to reset the batch. When the RESET button ("B") is pressed, the unit will reset to "0" Zero.

There are two ways to initiate this command. The first is through the front panel using the RESET button ("B"). The second is through the terminal block (remote reset) in the rear of the unit.

When the unit is reset, the relays are also reenabled if they were turned off by reaching the preset values.

3-8 Stop ("C" Button)

This command is used to stop a batch that has already started. There are two ways to initiate this command. The first is through the front panel with the STOP ("C") button. The second is through the terminal block (remote stop) in the rear of the unit.

When the unit receives a stop command, the word STOPPED will appear on the display and both relays will disengage. Once a batch has been stopped, it can be restarted by pressing the START ("A") button.

When the unit is stopped, the operator has the option of resetting all of the parameters of the unit.

3-9 Warning Messages

PREWRONG

Prewrong is a warning message given to the operator indicating the values in preset and prewarn are not acceptable. For example: this condition will occur if the preset value is less than the prewarn value.

OVERFLOW

Overflow is a warning message to the user that the unit is receiving too many pulses into the count input. This indicates that the input frequency has exceeded the 20 KHz maximum of the unit. The unit

will not be able to handle the overflow of pulses. At this point, the unit will begin to lose count in the display.

DATA LOST

Data Lost is a warning message indicating the unit is trying to output more pulses out of the scaled pulse output line than the unit can handle. The maximum count speed out is 20 kHz.

Section 4 MAINTENANCE

4-1 GENERAL

The Model 300 Electronic Batch Controller/-Totalizer does not require any "Routine Maintenance" to be performed by the user. If a problem should occur; and if after all troubleshooting procedures have been exhausted, refer to Section 5-2 for procedures for repair and/or replacement.

Section 5 TROUBLESHOOTING

5-1 General

The following troubleshooting procedures have been developed as an aid in locating defects. Each problem could not be considered or listed, but a general isolation procedure is presented.

5-2 Repair

If it is determined that the unit is faulty, contact your local Factory Representative or Sales Office concerning replacement. The Model 300 Electronic Batch Controller/Totalizer is not field servicable and all repairs should be performed at the factory.

Table 5-1 Troubleshooting

Symptom	Possible Cause	Test Procedure	Corrective Action
No display reading	No power to unit.	Check AC voltage input on terminals TB 1-17 and 18.	If power checks okay - replace unit.
		Check D.C. voltage input on terminals TB1-11 and 13.	
		(See Specifications Sect. 1-3 for proper input voltages)	
Unable to start batch	1. Incorrect programming	Review operational procedures in manual	Reprogram unit as required.
	2. Defective P.C. Board	Depress start button and check for relay action on terminals TB2-1 through 7. Use an OHM meter to perform check.	If no relay action, replace unit.
Unit not totalizing	1. Incorrect programming	Review operational procedures in manual.	Reprogram unit as required.
	2. No pulse input	Use oscilloscope to check for pulse input between terminals: TB1-2=GRD TB1-3=Count Input (+) (See Specifications Sect. 1-3 for proper pulse input voltage levels.)	If pulse input is present, replace unit.