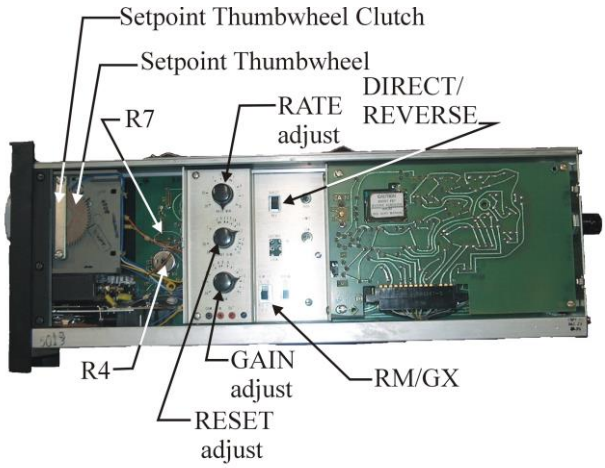
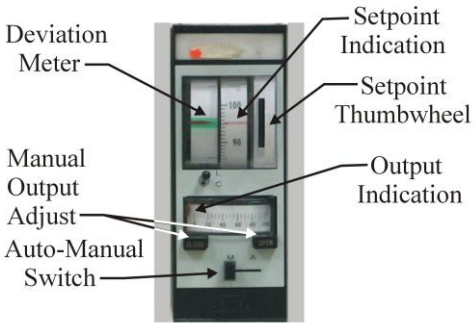
Applications

A. Applications

1. Bailey Type 701 Controller





Picture 1, Bailey 701 PID Controller

2. Basic self-contained PID controller.
   a. 1 - 5v input, 4 - 20 mA output
   b. Local or remote setpoint

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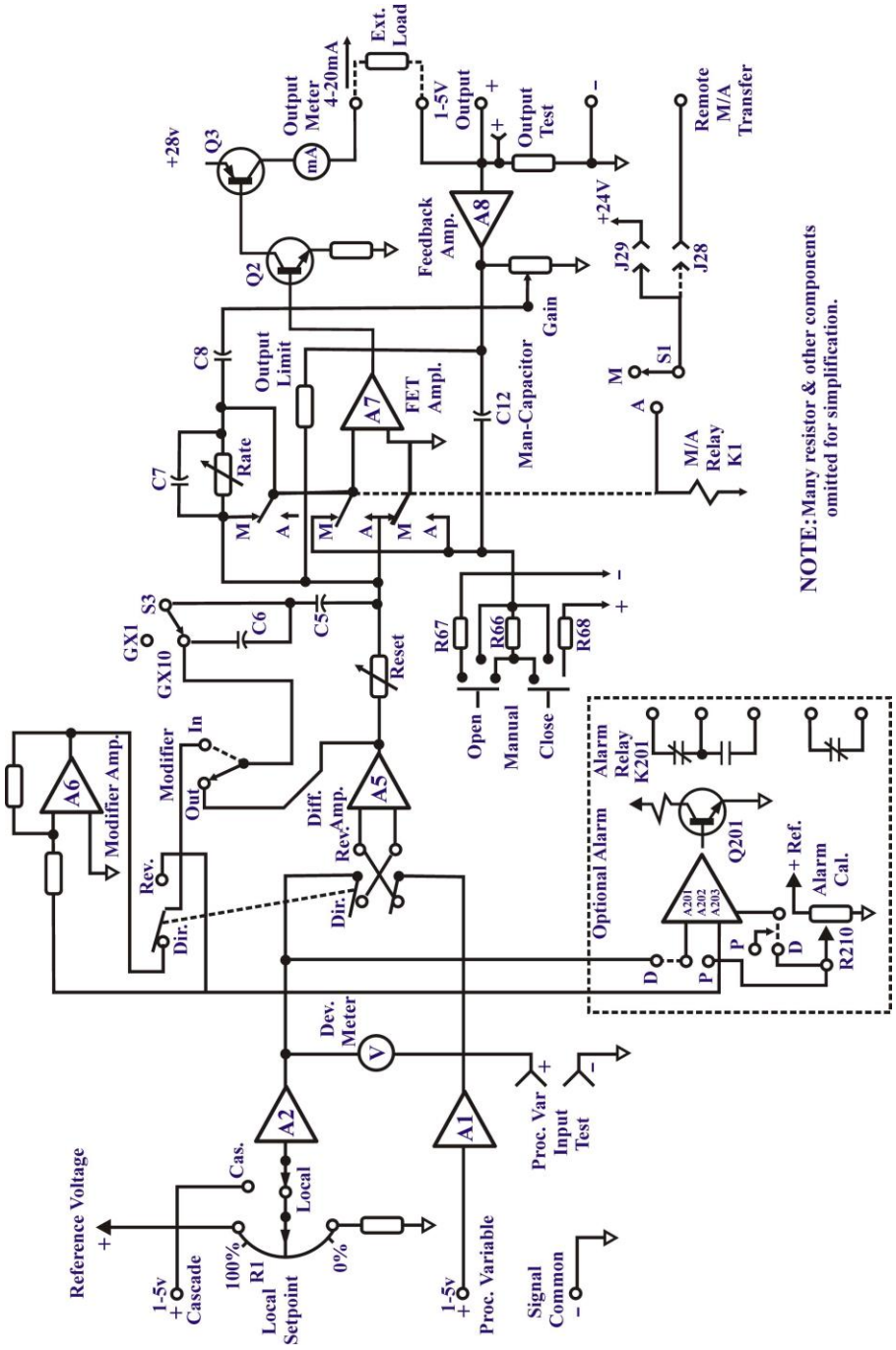
3. Functional Schematic Diagram



Picture 2, Bailey 701 PID Circuitry

a. Local or remote setpoint and measured variable applied to difference amp after passing through reverse/direct switch.

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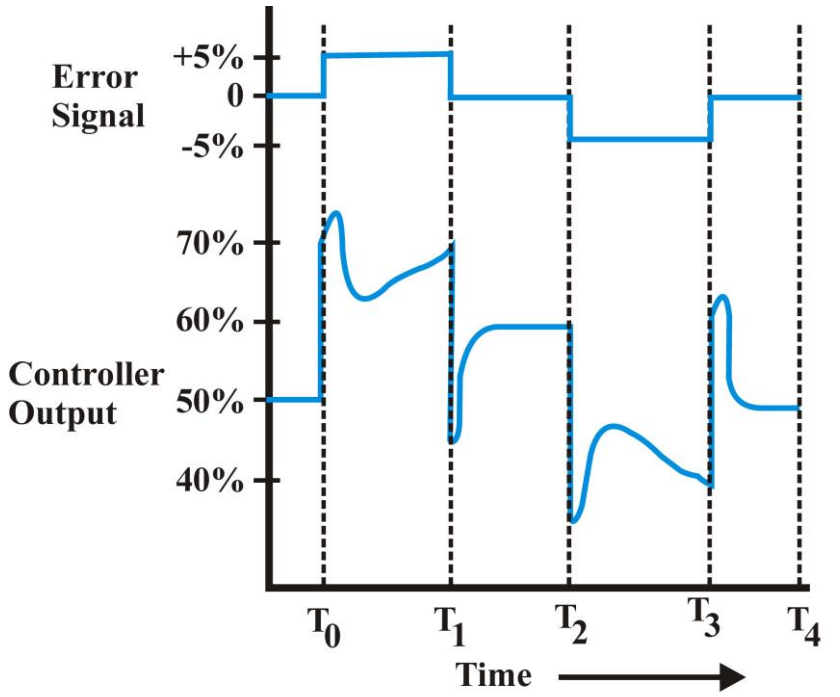
b. Modifier amp also gets setpoint and variable signal. If modifier amp switch is "in" then it enables controller to respond to setpoint gradually rather than in a step manner.

c. Error signal out of A5 is applied to A7 circuit and is gained and modified for integral, derivative and prop.

d. Q2 and Q3 are output drivers for 4 20mA.

4. Auto-manual operation



Picture 3, Open Loop Response of PID Controller

a. R66 common to both open and closed positions.

1) R66 causes slow change of output current at about 50 seconds for 100% output change.

2) If operator presses button hard, the center contact shorts out or bypasses R66 causing full output change in 5 seconds.

3) For this reason - use caution when manually changing output.

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4) Polarity of input into FET amp determined by open or closed manual switches and also the voltage stored on C12.

5) Shifting from manual to automatic is "Bumpless" because charge on C8 same as that on C12

5. In AUTO- input 1-5VDC
6. In LOCAL the setpoint provides 1 5VDC for 0 100% of seals.
7. Change in setpoint causes output of A5 to increase.
8. Input capacitor now charges as ramp because reset resistor is in charging path for input capacitor.
9. Without maxifier circuit, input capacitor would charge immediately rather than as a ramp.
10. A6 amp has unit gain - used when direct acting.
11. Proportional action of main amp A7 determined by input capacitor C5 or C5 and C6 in Gx1 position.
12. Gain control determine amount of feedback applied to feedback capacitor C8.
13. Reset action controlled by reset resistor and C8.
14. C5 and C6 and rate resistor determine rate action
15. Output voltage from A7 converted to current signal by Q2 and Q3.
16. Feedback amp, A8 has unity gain and isolates the output current signal from feedback circuit.

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PRACTICE:

1 Of the three control functions, Proportional, Integra, and Derivative, which one(s) do(es) the Bailey 701 controller perform?

2. In the Bailey 701 controller, how is the controller changed from Direct acting to reverse acting? (which component)