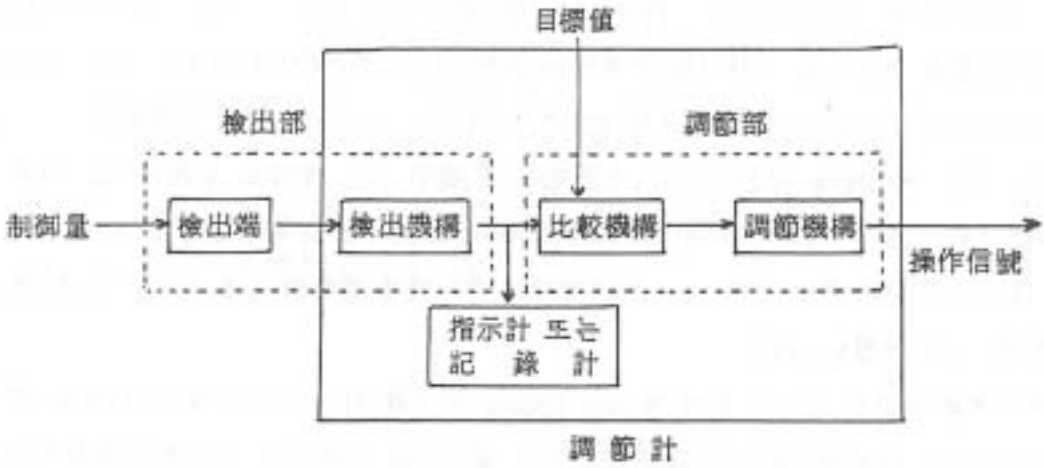


(3)

4.

(訂正動作信號)

， ， ， 　　が が
． < 13> ．

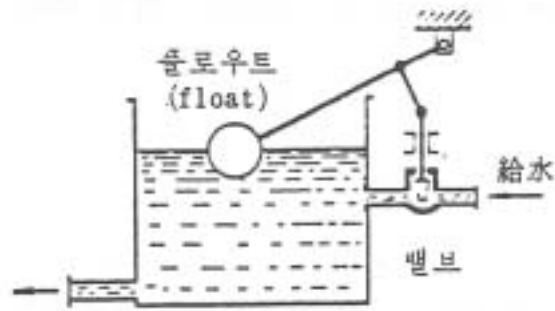


< 13>

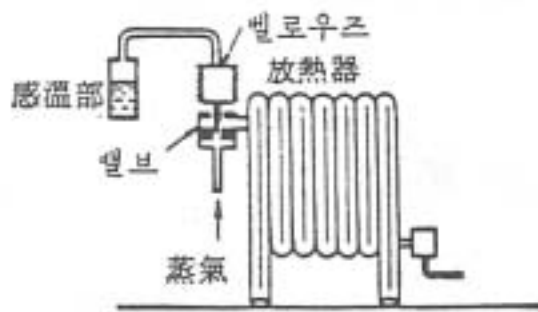
(自力式), ， ，

(組合式) ．

< 14> (自己變位)



(a)



(b) (自動放熱器)

< 14 >

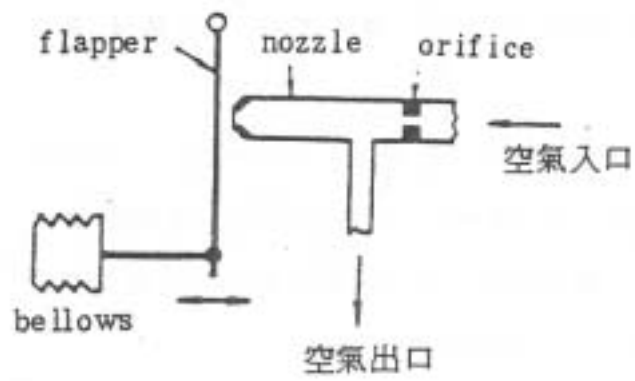
, (電位差計)(potentiometer)

, ,

가

< 15> Nozzle flapper 가 ,

< 15>

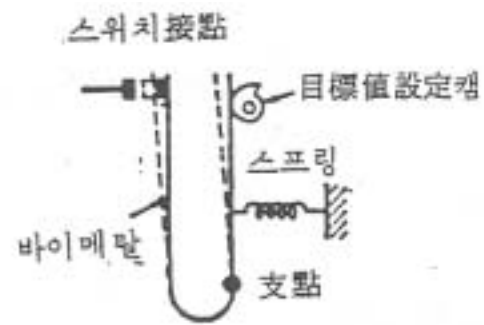


< 15> Nozzle flapper (機構)

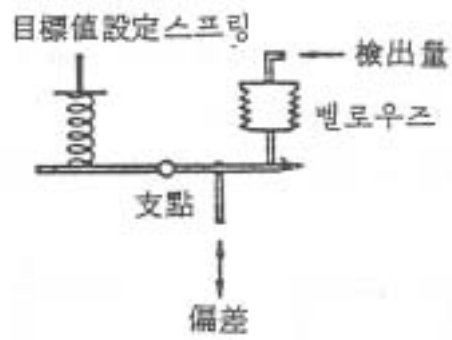
가 < 16>

< 16> (a) (thermostat)

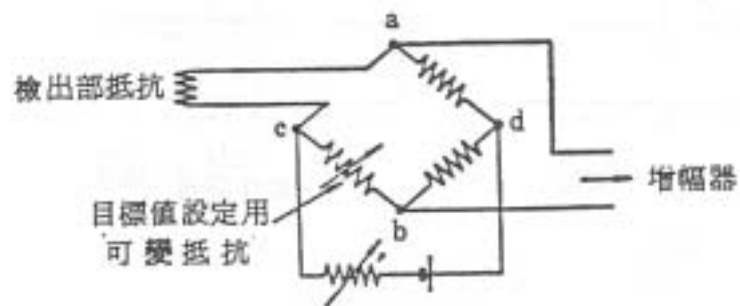
, (b) , (c)



(a)



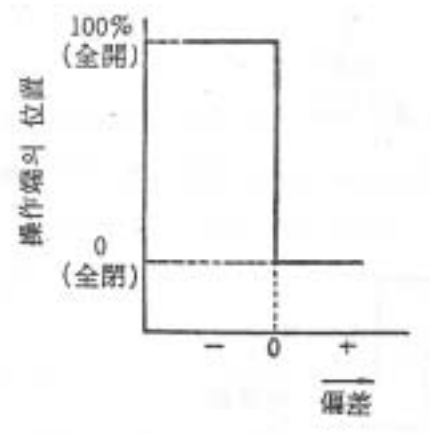
(b)



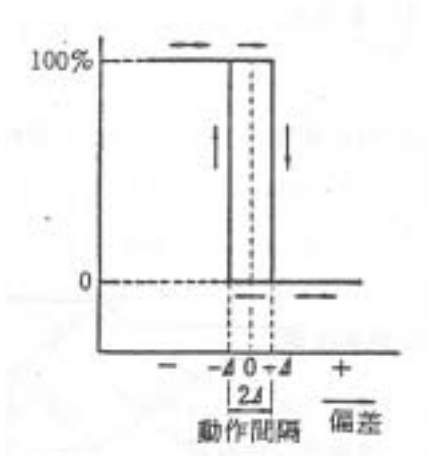
(c) Whiston bridge

. 2 (位置動作),
 (多位置動作), (單速度動作), (多速度動作),
 (比例位置動作), (積分動作), (比例+積分動作),
 (比例+微分動作), (比例+積分+微分動作)
 가 가 (述) .

4.1 2 (位置動作)



(a)



(b)

on-off

(正負)

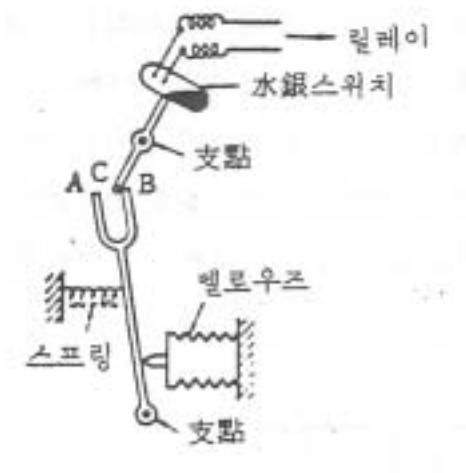
< 17>

(b) ±

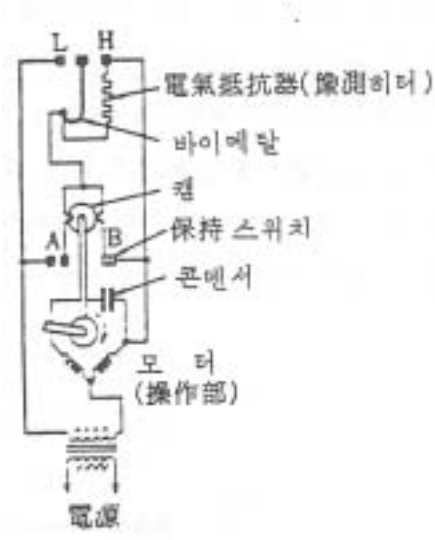
(a) + -

< 18> 2 (位置動作)

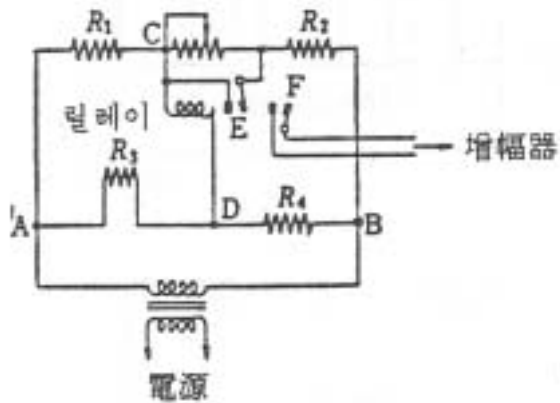
(一例)



(a)



(b)



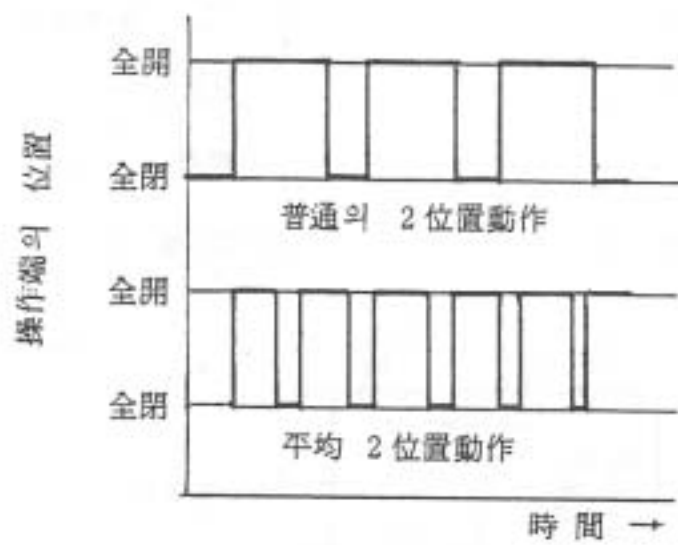
(c)

< 18> (位置動作)

가

2 (位置動作) ±

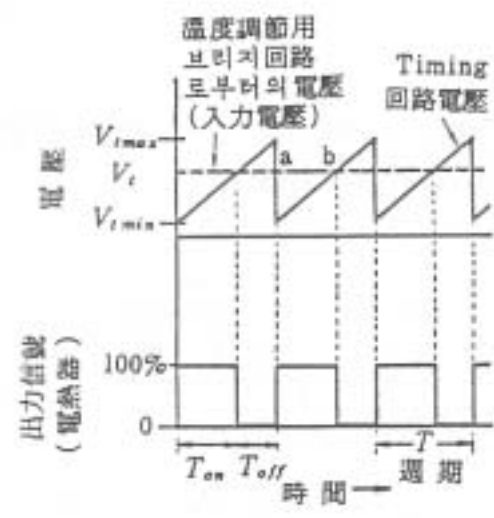
2 (位置動作) .



< 19> 2 (位置動作)

< 18> (b) ()가
 , 가
 L , 가 .
 가 L .
 . < 18> (全開)
 (全閉)

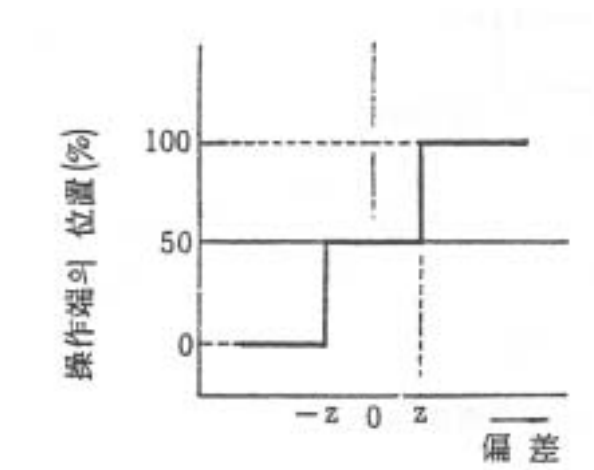
< 20>
 on . on-off 2 (後述)
 (時間比例動作)
 SCK
 , 가
 Ton . T
 on-off



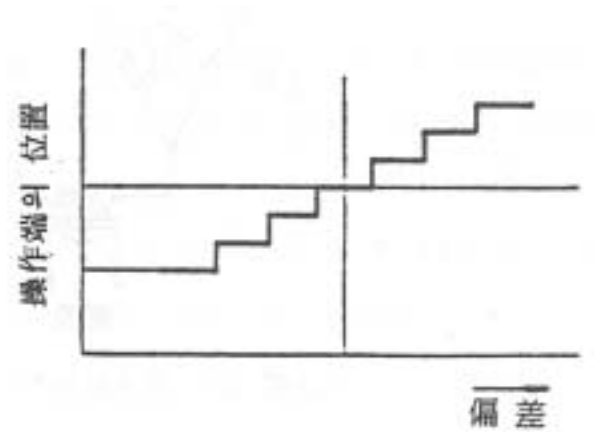
< 20> (時間比例制御)

4.2 (多位置動作),

3 (位置動作) step 가 (21, 22).



< 21> 3 (位置動作)

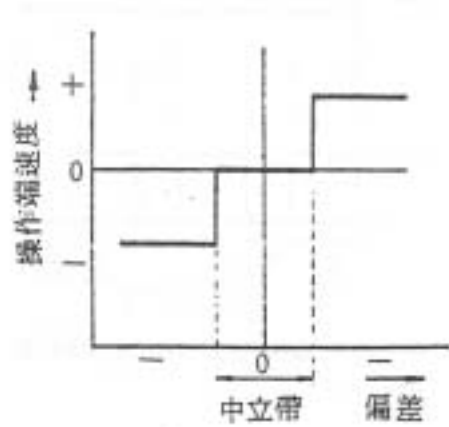


< 22> Step

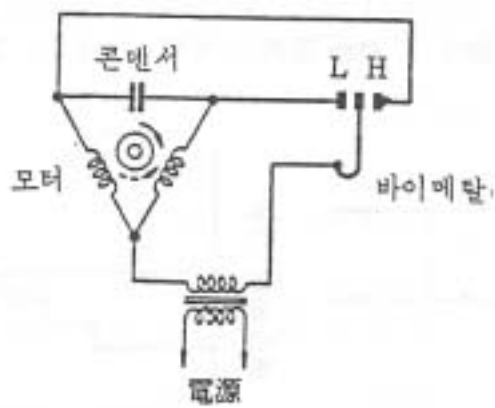
4.3 (單速度動作)

Floating . < 23>

(中立帶)



< 23> (單速度動作)



< 24> (單速度動作) ()

(單速度動作) (時定數) ,

4.4 (比例)()

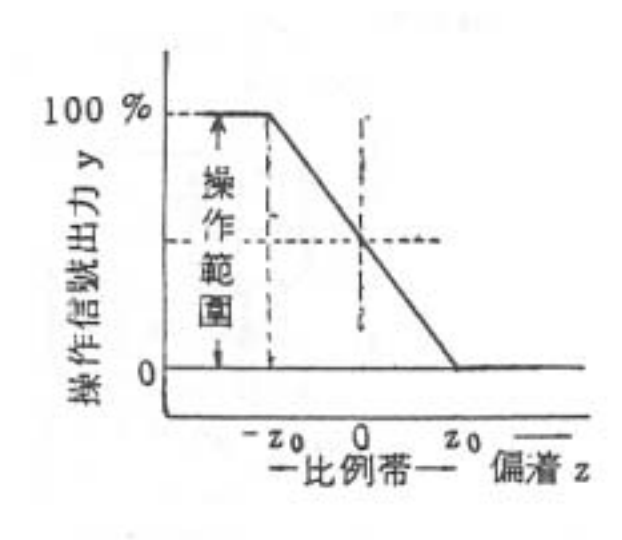
P .

z, y

$$y = -K_p \cdot z \text{ -----(8)}$$

K_p :

$$1/ K_p$$



< 25> (比例動作)

例亂) 0

(例亂)

가 0

가

off-set (外亂)

(外亂)

0

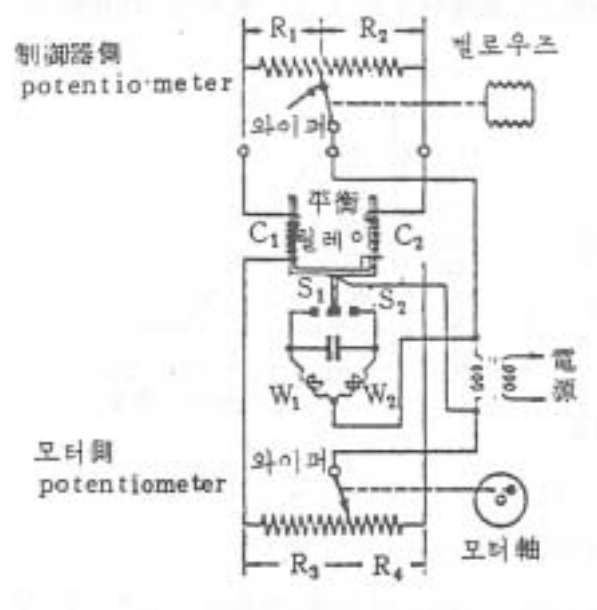
0

reset

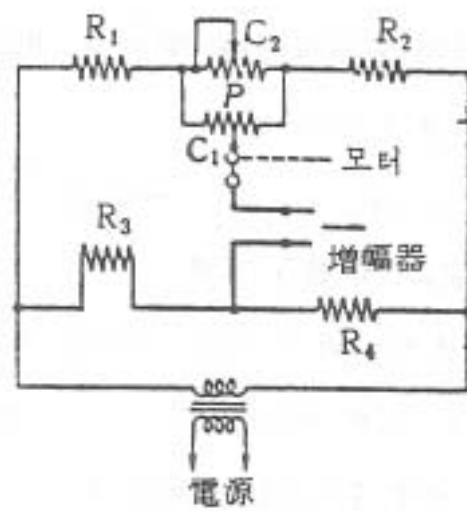
(述)

(積分動作)

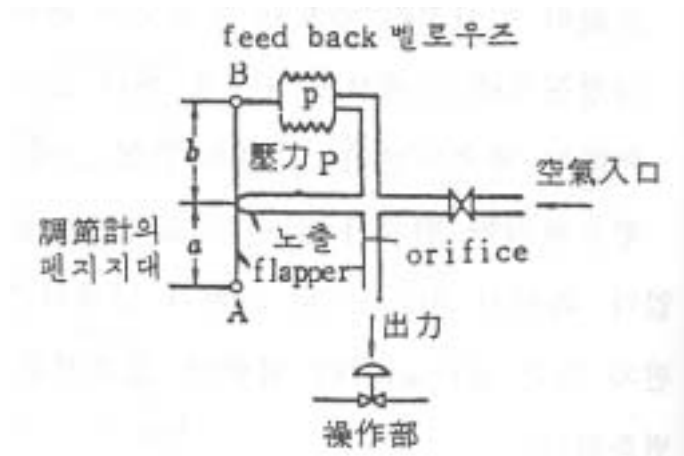
. < 26 >



(a)



(b)



(c)

< 26> (比例動作)

4.5 (比例)+(積分動作)(PI)

가

(操作端) 가

. (操作端) 가

z, y, t

가 (操作信號出力)

dy/dt

$$\frac{dy}{dt} = -y_1 z \text{ -----(9)}$$

. k .

$$y = -k_1 \int z dt \text{ -----(10)}$$

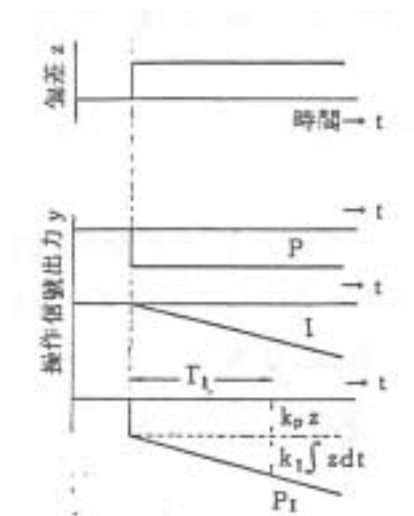
, .

.

(比例)+(PI)

$$y = -k_p z - k_1 \int z dt \text{ -----(11)}$$

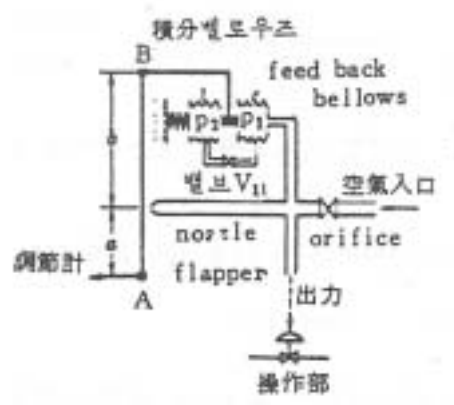
T_1



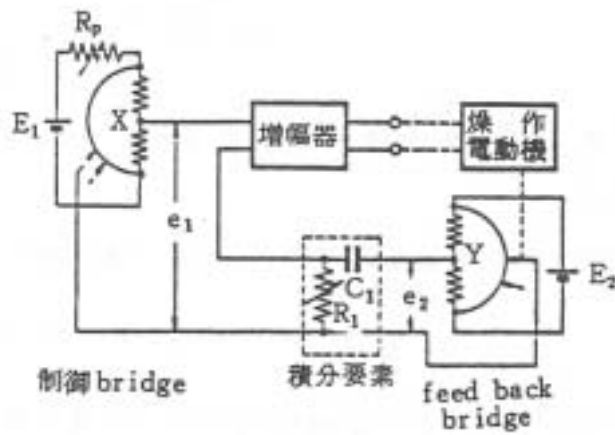
< 27> (比例)+ (積分動作)

$$y = -k_p(z + \frac{1}{T_1} \int z dt) \text{ -----(12)}$$

$1/T_1$ reset



(a)



(b)

< 28> (比例)+(積分動作)

< 28> +

4.6 (比例)+(積分動作)(PD)

가 (外亂)

가 가 가 .

z, y, t

$$y = -k_2 \frac{dz}{dt} \text{-----(13)}$$

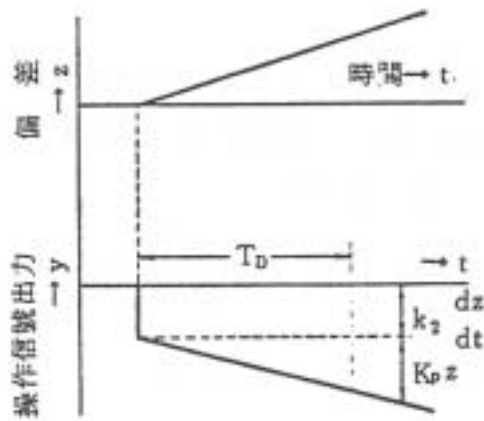
(微分動作)(D)

가

(減殺時間)

0 가

$$dz/dt = 0$$



< 29> (比例)+(積分動作)

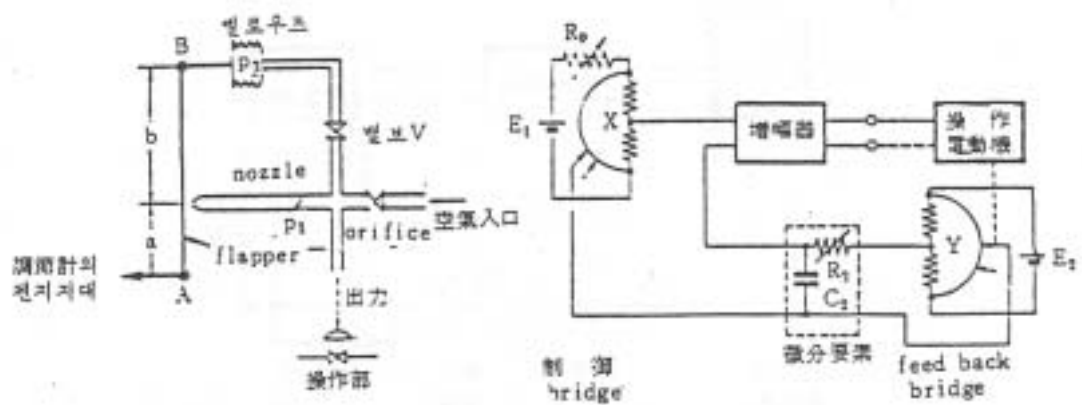
$$y = -k_p z - k_2 \frac{dz}{dt} \text{ ----- (14)}$$

가

T_b

$$Y = -k_p(z + T_D \frac{dz}{dt}) \text{ ----- (15)}$$

< 30> +



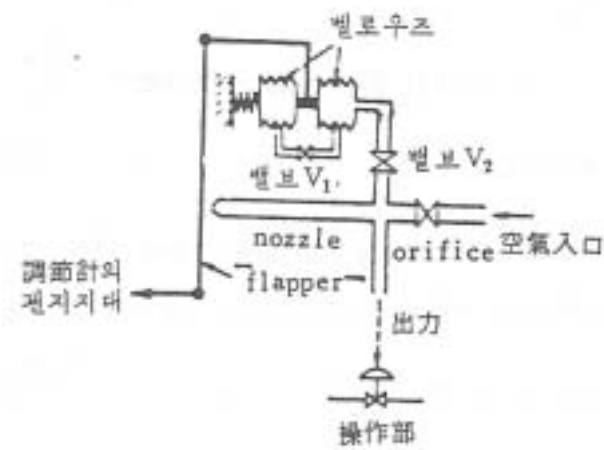
< 30> (比例)+(微分動作)

4.7 (比例) + (積分) + (微分)(PID)

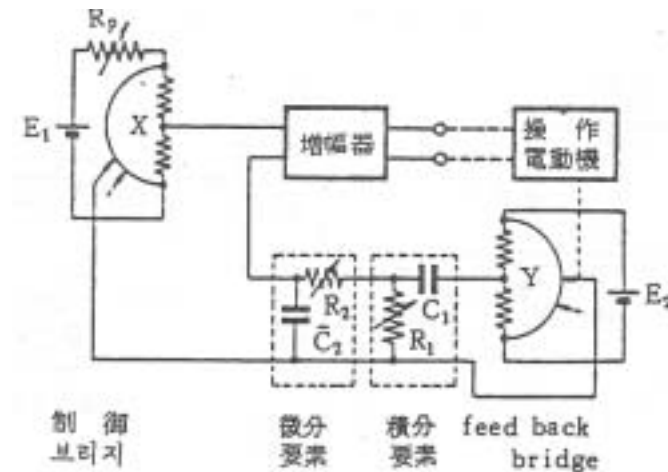
PID 3가

$$y = -k_p(z + \frac{1}{T_1} \int zdt + T_D \frac{dz}{dt}) \text{-----(16)}$$

$$K_p : \qquad T_1 : \qquad T_D :$$



(a)



(b)

< 31> PID

.