



(0.2-1kgf/cm² / 3-15psi)
1950

가 . P/P

I/P

(가

),

가

가

E/P

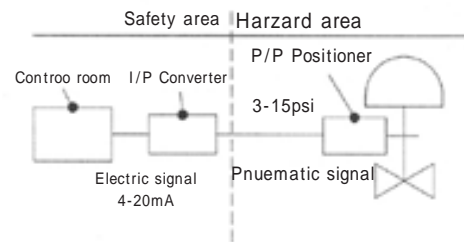
가

SMART

P/P

가 가

P/P, I/P,



(1) P/P

Pnuematic - Pnuematic positioner

1. P/P



가 P/P

P/P

(2) E/P

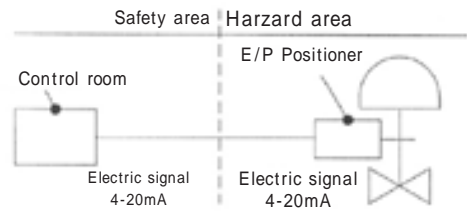
Electric-pneumatic

, P/P

1970

. P/P

가



2. ,

, E/P

I/P 가

E/P

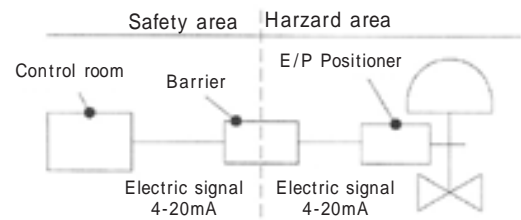
가 ()

,

가

P/P

가



3.

, E/P

E/P

가

가,

E/P
)

(가 .

가 ,

가 .

, , 2가

(3)

1980

90

MPU

가 , 가 .

가 ,
가

가 5

가 ,
16 ~ 256
가
가 가

가 가
가
3가 가
4

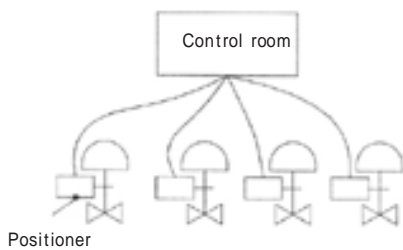
1:1
가 100
100
가

a. HART
Highway Addressable Remote Transducer

4-20mA
Bell
1200, 2200Hz

4-20mA 가

가 가
가 HART
가



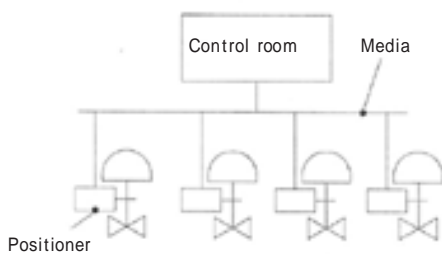
4.

b. FF (Foundation Fieldbus)

IEC 1997

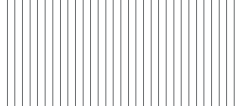
2003

7가
(IEC61158, IEC61784)



5.

FF 가
가



(31.25kbps)

H1
HSE

(Transmitter)

c. Profibus

Profibus-DP

Profibus-PA가

가

4-20mA

. FF

(1) 2가

4wire

2 2

가

R1 R2 , R3

가 , 가

R1+R2

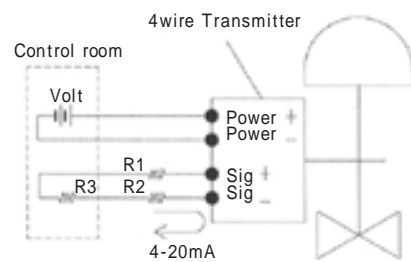
가

, 가 .

가

가

가



- LCD

6. 4wire

-

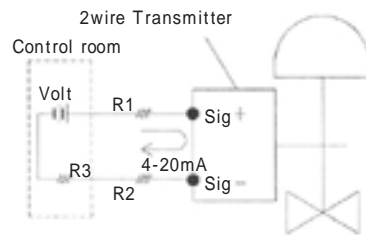
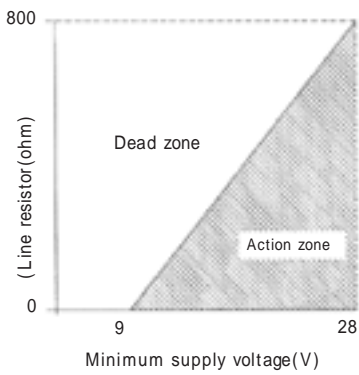
(EqualPercent,QuickOpen,Linear,UserSet)

- PID

-

가

7

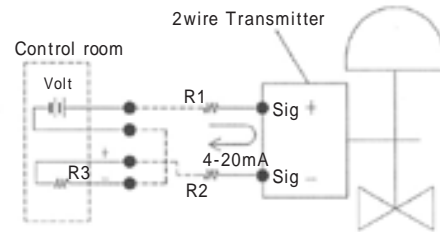


8. 2wire

가 4wire
가 2wire

28V

$$(V) = \frac{19 \times}{800} + 7200$$



9. 4wire -2wire

500
21(V)
500
가 21(V)

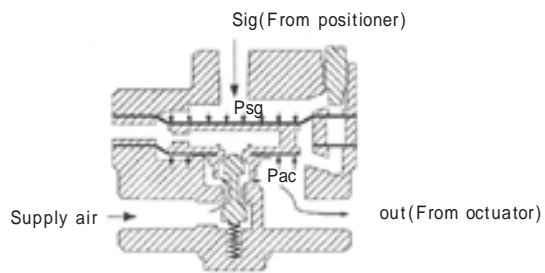
2wire

가 2

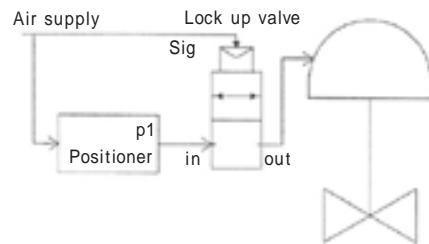
4wire

2wire

8 2wire
4wire

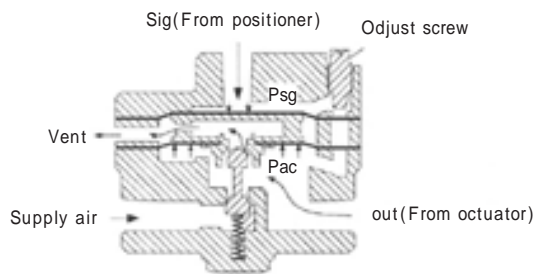


13.



15.

()



14.

가

가 가

Pac

가

in
out

out

15

가

)

(

in,out

가 Pa

가

가

가

가

Adjust screw

in,out

가

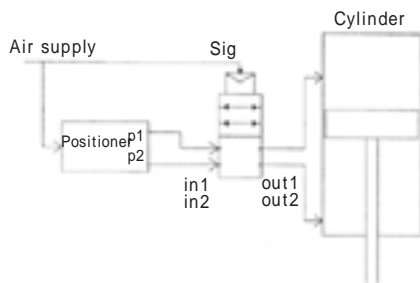
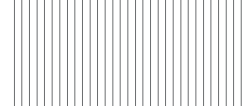
Air fail freeze

가

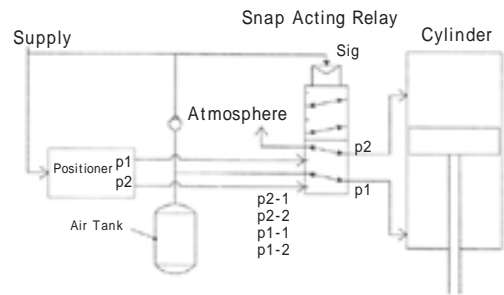
(Lock Up Valve)

가

가



16. ()



18. ()

(Snap Acting Relay)

(P1)-(P1-2), (P2)-(P2-2)

Fail ,

가

Fail safe ,

가

Fail safe ,

(P1)-(P1-1),(P2)-(P2-1)

가

17

P-

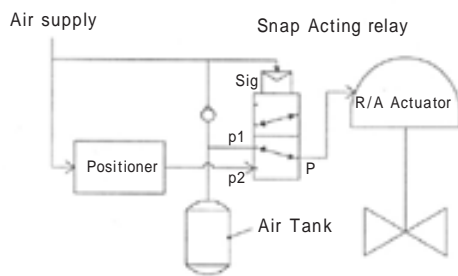
P2

가

가

가

P-P1 가



17.