

SMART CEDM

Design of Angular Position Detector for SMART CEDM

, , , ,

150

Abstract

The measurement of the rotor position of RSM(Rotary Stepping Motor) used in SMART CEDM(Control Element Drive Mechanism) is very important means to ensure the safety of the reactor. This paper presents the design of an angular position detector and the test results of the prototype.

1.

가 .
1mm

. 가

가

가 .

가

Shippingport

PWR, Hallam, Enrico-Fermi, Peach Bottom NRU

.[1]

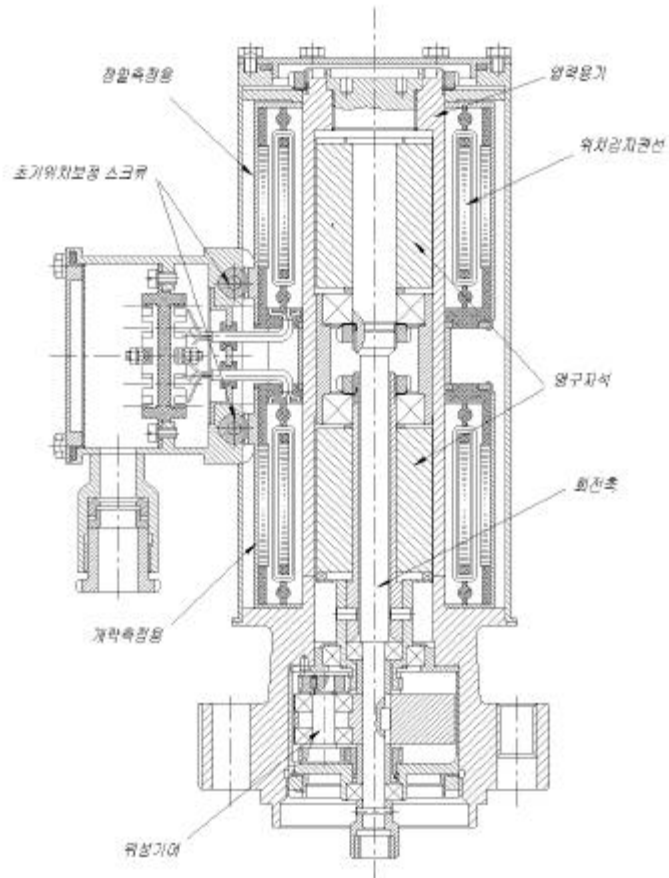
(RSM ; Rotary Step Motor)

가

2.

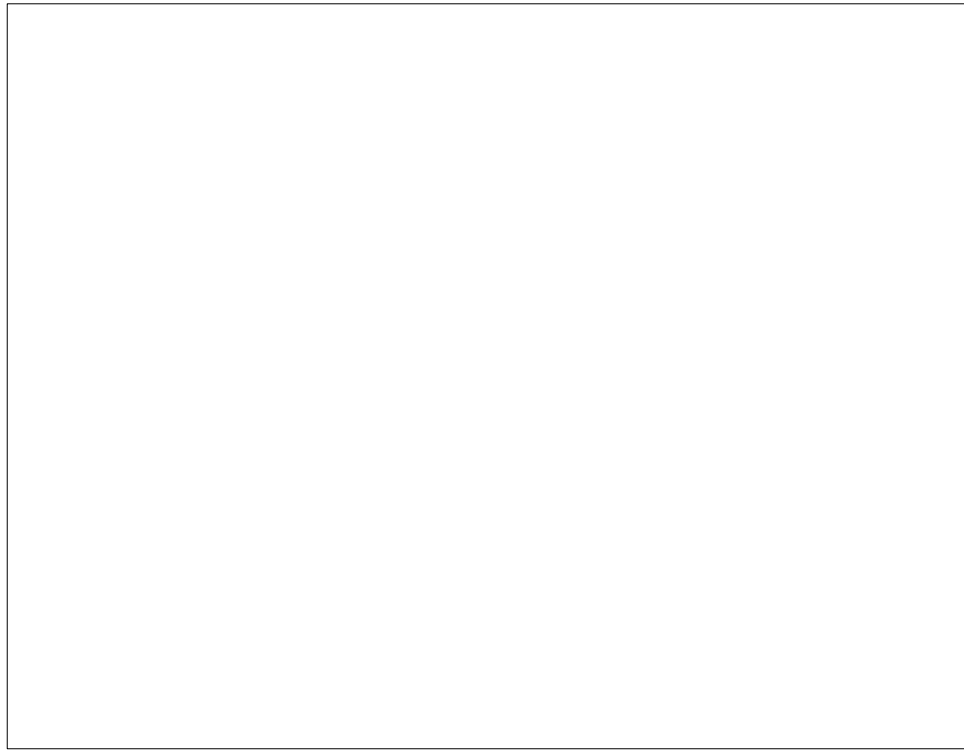
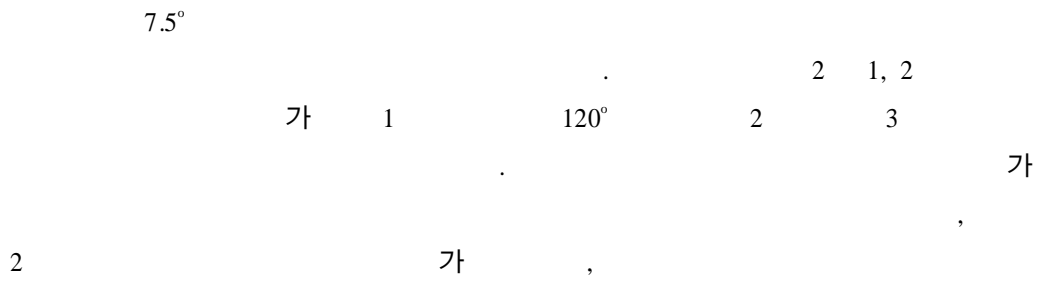
1

가

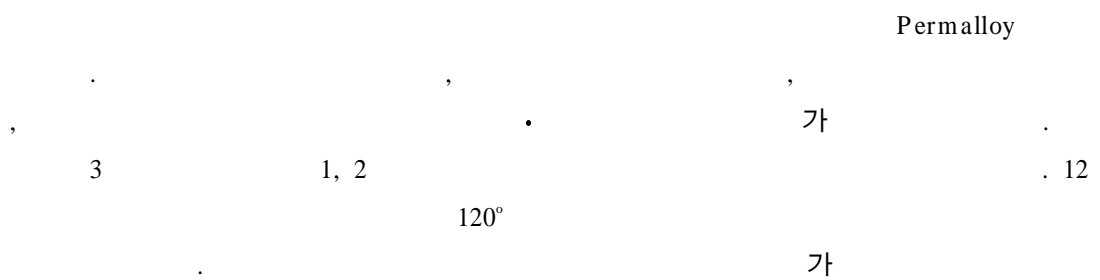


1.

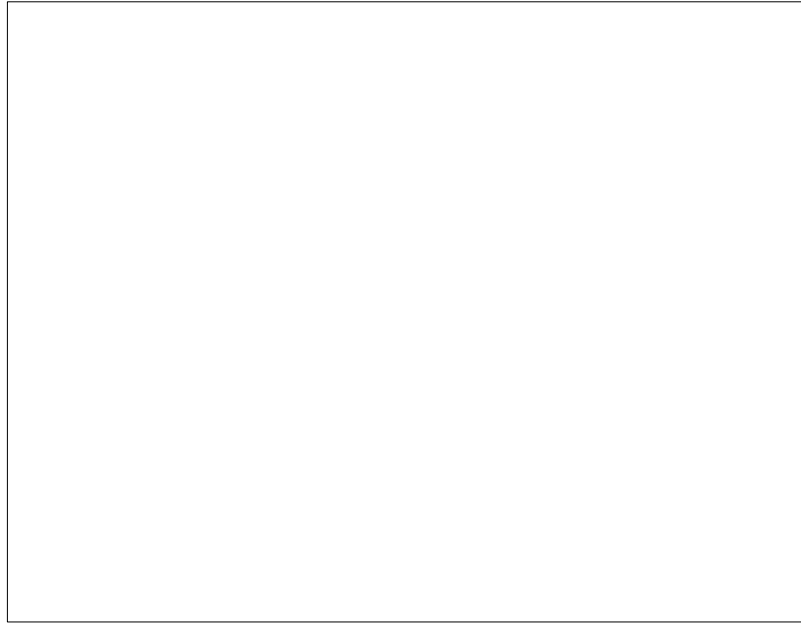
(1)



2. 1, 2



가 .
 (exciting voltage) 가 toroid
 1, 2 3
 2 . 2
 가 .



3.

(2)

가 1:120 가 1
 3°(360/120) 가

(3)

가 1 $V_1 = V_{1m} \sin wt$,
 θ 20° 3 2
 (1)-(3) (E_A, E_B, E_C) .

$$E_A = K V_{1m} \sin (wt) \sin (\theta) \quad (1)$$

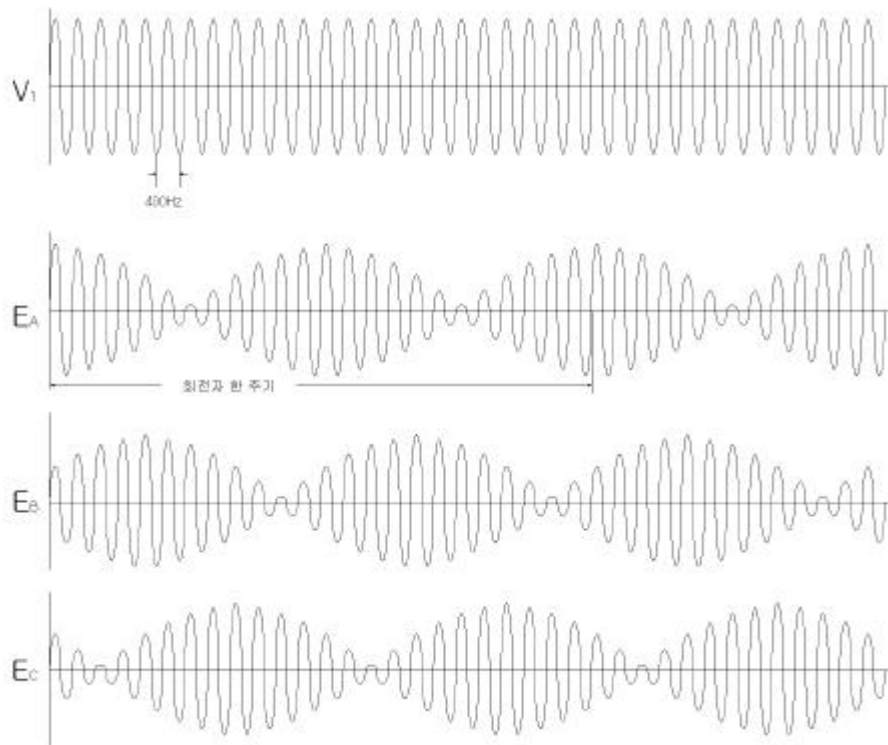
$$E_B = K V_{1m} \sin(\omega t) \sin(\theta - 120^\circ) \quad (2)$$

$$E_C = K V_{1m} \sin(\omega t) \sin(\theta - 240^\circ) \quad (3)$$

K : , V_{1m} : 1

(1)-(3)

4



4. 2

2

가

(4)

1

가

115VAC, 400Hz

2

3

가 11.8VAC

400Hz가

0.5mm . 1

120

, 2

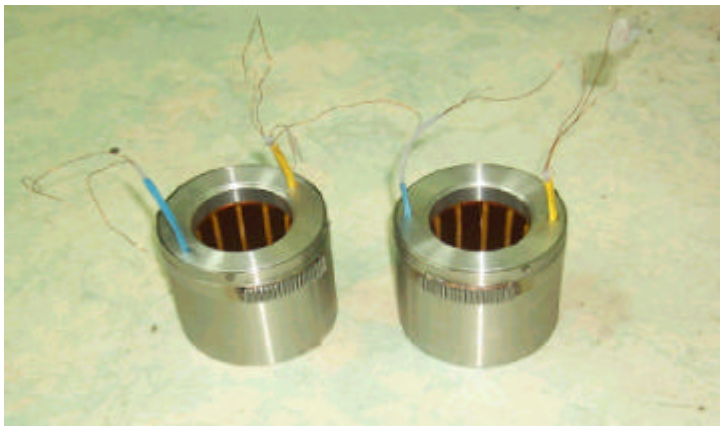
480

3.

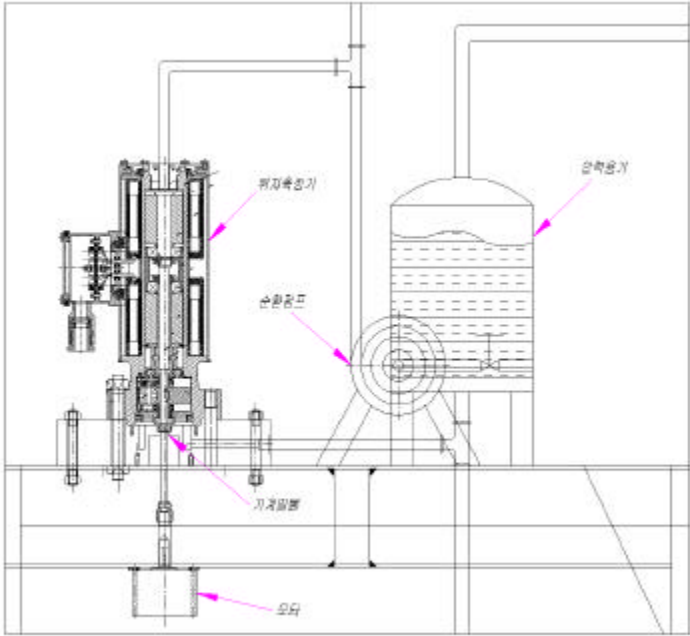
(1)

5

6



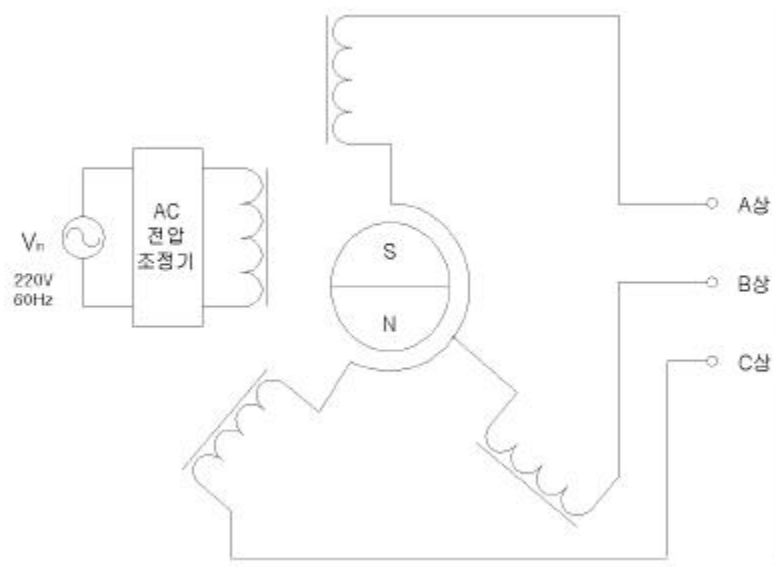
5.



6.

(2)

7
2 120 , 1 10 . 1 120
480 . 1 가
가 가 가 25V
5-15V , 5.4V



7.

(가) 5V 60Hz 가 가

() 가 가 , 가

() , 가
가 가

1 , 8

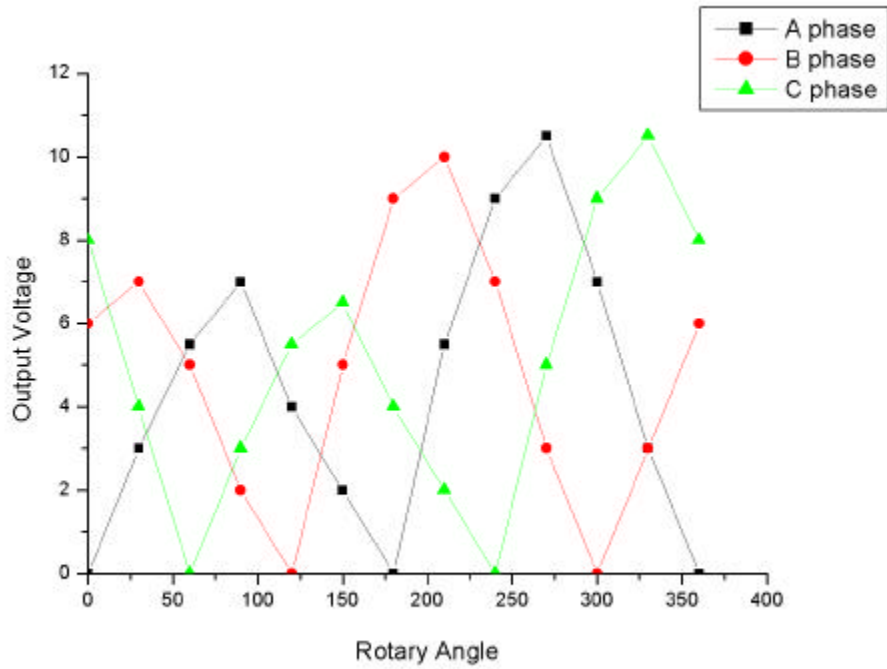
120°

가

가

1.

	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°	360°
A	0	3	5.5	7	4	2	0	5.5	9	10.5	7	3	0
B	6	7	5	2	0	5	9	10	7	3	0	3	6
C	8	4	0	3	5.5	6.5	4	2	0	5	9	10.5	8



8.

4.

(가) CEDM

가

2

가

()

N, S

가

[1]

, 1999. 12.

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