

## □ Function & Features

- Frequency or Pulse inputs
- 10-position rotary switch : ( x100, x10, x1 ) x Rate(Hz)
- Rotary Switch Type :  
The Input range is set by using a combination of Rate(Hz) and the rotary switches.  
The rotary selector value is multiplied by the multiplication factor set on Rate(Hz)  
The minimum full-scale value for the input is : 001 x 0.0001 = 0.0001 Hz  
The maximum full-scale value for the input is : 999 x 1000 = 999000 Hz
- Display Type : Front-programmable 4-digit LED display  
\*\*\* ( Input of 50KHz or more is an order specification. )
- Four-way isolation (input/output1/output2/power)
- Protection Input and output TVS diode
- Analog One or Two outputs (independent output module)
- Universal power input
- Power fuse (240V/0.12A)



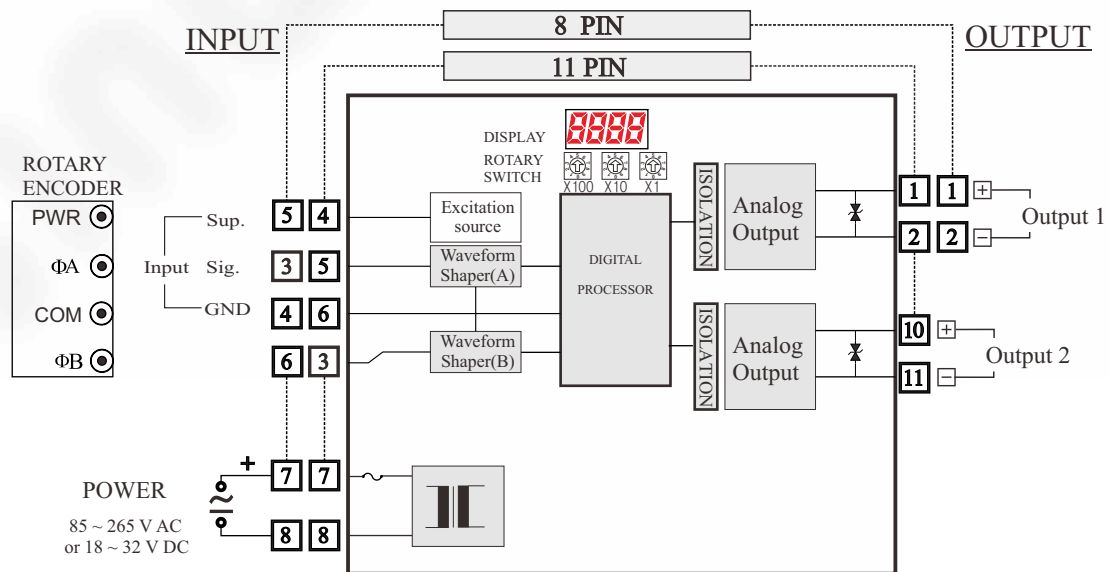
## □ PERFORMANCE

- Accuracy :  $\pm 0.2\%$  LESS(F.S) at 23 °C
- Temperature Coefficient :  $\pm 0.015\%$  / °C
- Response Time : 0.5 Sec or less ( < 5Hz )
- Insulation Resistance : 100 MΩ or more with 500V DC between Input / Output / Power
- Dielectric Strength : 1500V AC 0.5 mA/Min (Input to Output to Power)

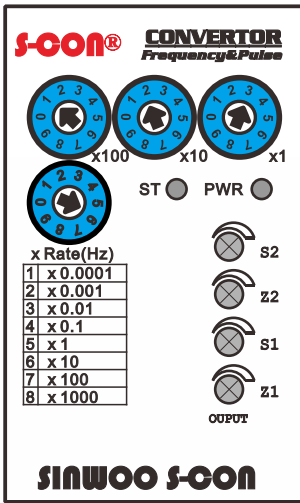
## □ GENERAL SPECIFICATIONS

- Construction : Plug-in
- Connection : M3.5 Screw terminals
- Housing material : flame-retardant Poly Carbonate (Black)
- Power supply : AC 85 ~ 265V or DC 18 ~ 32V ( about 3VA )
- Operating temperature : -5 ~ 55 °C (23 ~ 131°F)
- Operating humidity : 10 ~ 90 % RH (non-condensing)
- Isolation : Input / Output 1 / Output 2 / Power
- Display range : 4 Digits (-1999 ~ 9999)
- Dimension : W52 x H77 x D112mm (2.04" x 3.03" x 4.40")
- Weight : about 350g

## SCHEMATIC CIRCUIT & CONNECTION DIAGRAM



## ※ ROTARY SWITCH



### Input

The Input range is set by using a combination of Rate(Hz) and the rotary switches.  
The rotary selector value is multiplied by the multiplication factor set on RATE(Hz)

### For Example:

The input frequency full-scale value is 563Hz.  
The 100's selector is set to 5, the 10's selector is set to 6 and the 1's selector is set to 3.  
The multiplier is then set to 5(x1) (563 x 1 = 563Hz).  
The minimum full-scale value for the input is : 001 x 0.0001 = 0.0001 Hz  
The maximum full-scale value for the input is : 999 x 1000 = 999000 Hz  
\*\*\* ( Input of 50KHz or more is an order specification. )

### Calculation of input frequency :

$$((N \times 100) + (N \times 10) + (N \times 1)) \times (6 : x10 \text{ Rate(Hz)})$$

$$((1 \times 100) + (2 \times 10) + (3 \times 1)) \times (10) = 123 \times 10 = 1230 \text{ Hz}$$

$$((1 \times 100) + (2 \times 10) + (3 \times 1)) \times (0.1) = 123 \times 0.1 = 12.3 \text{ Hz}$$

## ■ INPUT SPECIFICATIONS

Excitation : 12V DC  $\pm$ 2V @30mA

### - Open Collector

Max. frequency : 100 KHz  
Sensing : Approx. 12V DC @2.5 mA  
ON/OFF Level : >OFF (>2.5k $\Omega$ /6V), ON (<1.6k $\Omega$ /4V)

### - DC Voltage Pulse

Max. frequency : 100 KHz  
Waveform : Square or Sine  
Input impedance : 10 k $\Omega$  min.  
Input Amplitude : 2~50Vp-p  
Detecting Level : 12V pulse : Low(off) < 4V - 6V < High(on)  
5V pulse : Low(off) < 1V - 3V < High(on)

### - AC Voltage Pulse

Max. frequency : 100 KHz  
Waveform : Sine  
Input impedance : 10 k $\Omega$  min.  
Input Amplitude : 0.1~100Vp-p ( $\pm$  50V max.)

### - Two-wire Current Pulse

Max. frequency : 100 KHz  
Input Resistance : 250  $\Omega$   
Input Range : 0 ~ 25mA  
Detecting Level : Low(off) < 4mA - 12mA < High(on)

- 10-position rotary switch : (X100,X10,X1) x (X)rate

- Frequency Range : 0.0001 to 999000 (\*\*\*) Input of 50KHz or more is an order specification. )

## ■ ANALOG OUTPUT :

- DC Current : 0 ~ 20 mA DC max. ( Load resistance : 600 $\Omega$  max. )
- DC Voltage : -10V min. ~ +10V DC max. ( Load Resistance : 10 K $\Omega$  or more )
- 2-Wire Transmitter(4~20mA DC), supply out voltage (9 V ~ 35 V DC)
- Easy Calibration of the Gain (Max.  $\pm$ 5% of F.S) and Offset(Max.  $\pm$ 5% of F.S)

## MODEL & SUFFIX CODE

NFDC - □ □ □ □

### Model Type Selection

- 2 : 1 Output with Display
- 5 : 1 Output with Rotary Switch
- 7 : 2 Output with Display
- 8 : 2 Output with Rotary Switch

### Input Type Selection

- A : 3-Wire Voltage Pulse
- B : 2-Wire Current Pulse
- C : 2-Wire Voltage Pulse
- D : Open Collector
- E : Dry Contact

R : Other Special Spec.

### Output Type & Range Selection (Available for Output 1 & Output 2)

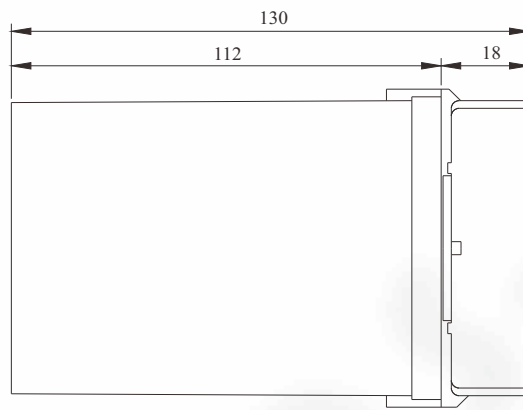
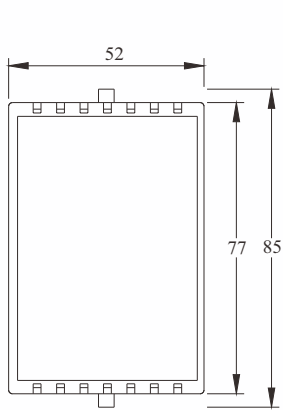
- 0 : Not Used
- 1 : DC 4~20mA (Load Resistance : 0~600 Ω)
- 2 : DC 0~20mA (Load Resistance : 0~600 Ω)
- 3 : DC 1~5V (Load Resistance : 5 KΩ or more)
- 4 : DC 0~5V (Load Resistance : 5 KΩ or more)
- 5 : DC 2~10V (Load Resistance : 10 KΩ or more)
- 6 : DC 0~10V (Load Resistance : 10 KΩ or more)
- 7 : DC -5~+5V (Load Resistance : 10 KΩ or more)
- 8 : DC -10~+10V (Load Resistance : 10 KΩ or more)
- 9 : 2-Wire Transmitter(4~20mA DC) (9V ~ 35V DC)

R : Other Special Spec.

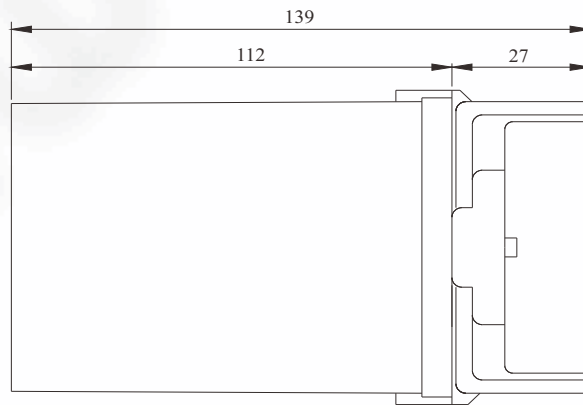
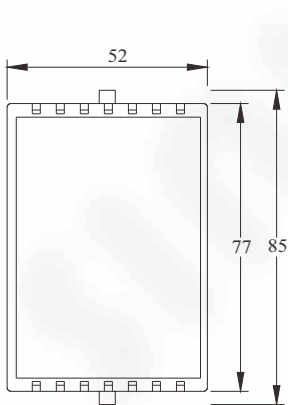
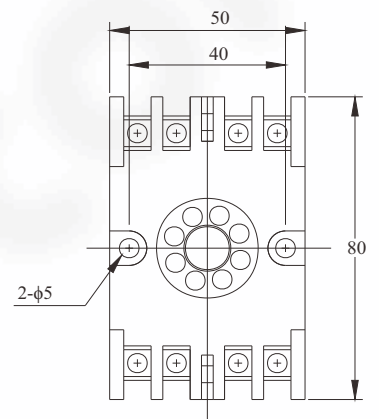
### Power Supply

- Z : AC 85~265V
- Y : DC 18~32V
- R : Other Special Spec.

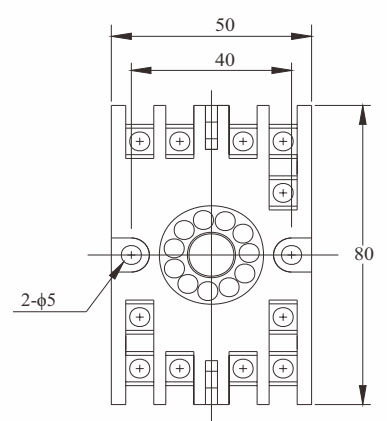
**DEMENSION**



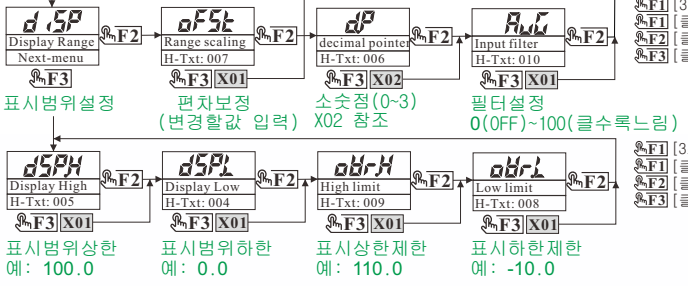
( 8 PIN SOCKET )



( 11 PIN SOCKET )



## F1 Menu (Operating Mode) 운전 모드



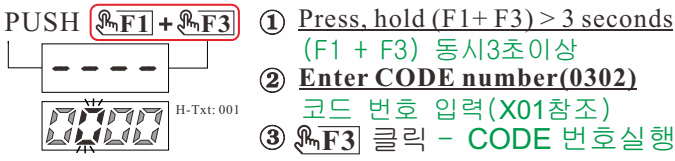
F1 [클릭]-메뉴시작 d.SP  
 F1 [클릭]-복귀 0.0

## DISPLAY

F1 [3초이상누름] - 복귀 0.0  
 F1 [클릭]-복귀 0.0  
 F2 [클릭]-다음메뉴  
 F3 [클릭]-선택(값변경)

F1 [3초이상누름] - 복귀 0.0  
 F1 [클릭]-메뉴시작 d.SP  
 F2 [클릭]-다음메뉴  
 F3 [클릭]-선택(값변경) X01참조

## Setting Mode (설정 모드)



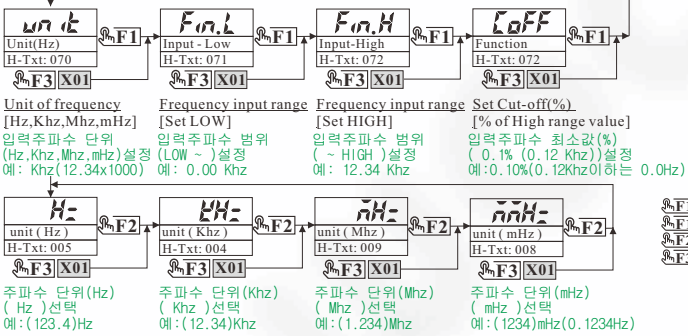
\*\* 주의가 필요합니다 [ Needs attention. ]

## Executable CODE (Setup setting)

CODE	Description
302	Set frequency input range [First, set the unit(Hz,Khz,Mhz,mHz)]
330	[FL.Ad]Display Filter(0:off~100),[FL.FV]Allowable fluctuation value (%)

실행할 CODE 번호  
 (000) 취소 ( cancel )  
 (302) 주파수 입력 범위 설정 (먼저, 단위설정)  
 (330) 필터 (0~100), 허용변동값 (%) 0.01~49.99%

## 302 (Input Range) 입력범위 설정

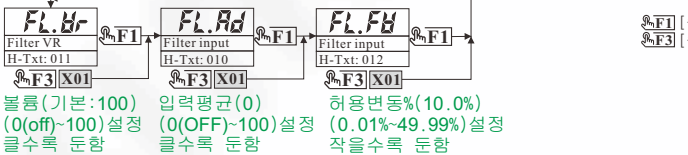


F1(Hold)>3sec. (302) 주파수 입력 범위 설정 (먼저, 단위설정)  
 X05 (Exit) F1 [3초이상누름] - 복귀 X05참조

F1 [클릭]-다음메뉴  
 F3 [클릭]-선택(값변경) X01참조

F1 [3초이상누름] - 복귀 0.0  
 F1 [클릭]-메뉴시작 d.SP  
 F2 [클릭]-다음메뉴  
 F3 [클릭]-선택(값변경) X01참조

## 330 (Filter) 입력평활



F1(Hold)>3sec. (330) 필터 (평활) 설정  
 X05 (Exit) F1 [3초이상누름] - 복귀 X05참조

F1 [클릭]-다음메뉴  
 F3 [클릭]-설정(값변경) X01참조

### HELP-Text :

- [001][---] Enter Setup (see the CODE number table)
- [004][dSP.L] Set display range low(display readout low)
- [005][dSP.H] Set display range high(display readout high)
- [006][dP] Set the decimal point position to a number ( 0 ~ 3 )
- [007][oFFt] Display range scaling for deviation correction  
 Low value calibration is less than 40% of displayed  
 High value calibration is more than 60% of displayed  
 Offset clear at display 50%
- [008][oVr.L] Set lower limit of display value.
- [009][oVr.H] Set upper limit of display value.
- [010][AvG][FL.Ad] Set input filter(0(off) ~ 100) It is similar to the input average(def: 0)[The higher the value, the slower it is.]
- [011][FL.Vr] Set VR(zs) filter(0(off) ~ 100) It is similar to the input average(def: 100)
- [012][FL.FV] Allowable Fluctuation Value(0.01 ~ 49.99%) [The smaller the value, the slower it is]

- [020][unit] (INPUT-A) Input Type ( see the CODE(Input-A) table) [0 ~ 6]
- [021][Fin.L] (INPUT-B) Input Type (see the CODE(Input-B) table) [0 ~ 6]
- [022][Fin.H] (FUNCTION) Selection of function (see the CODE(Function) table)[0~10, 101~109]
- [023][CoFF] Set a low input value for the display range (ex.: 4.00)

**X01 (Set Value)**  
 값 설정(값변경)  
 -1999~+9999

**F1 Next Digit**  
 다음 자리

**F2 Inc. Value**  
 숫자 올림

**F3 Set END**  
 설정 완료

**X02 (D.P.)**  
 소숫점설정  
 0000 ~ 0003  
 0 0  
 1 0.0  
 2 00.00  
 3 0000 0.000

**X05 (Exit)**  
 메인 복귀

**F1**

Press&hold>3sec.  
 3초이상 누름  
 DISPLAY(표시)

SAVE & RUN (MAIN)  
 저장 및 복귀

Output Type (OUTPUT-1, 2)			
Type		CODE	Range
Unspecified	OFF	0	
DC current	20 mA	1	4~20mA
	20 mA	2	0~20mA
DC voltage	5 V	3	1~5 V
	5 V	4	0~5 V
	10 V	5	2~10 V
	10 V	6	0~10 V
	±5 V	7	-5 ~ +5 V
	±10 V	8	-10 ~ +10 V

출력(1,2) 유형(0-8)설정(예: 4-20mA)

- (0)출력 없음(없음)
- (1)전류출력(4-20mA)
- (3)전압출력(1-5V)

\*\* 전압 및 전류출력은 주문시 결정 됩니다  
[Voltage and current output are determined when ordering]  
\*\* 출고시 표준 출력으로 설정 됩니다  
[It is set to standard output at the factory]

### Setting Mode (설정 모드)

PUSH **F1 + F3**

- Press, hold (F1 + F3) > 3 seconds (F1 + F3) 동시3초이상
- Enter CODE number(0302) 코드 번호 입력(X01참조)
- F3** 클릭 - CODE 번호실행

CODE Number H-Txt: 001

\*\* 주의가 필요합니다  
[Needs attention.]

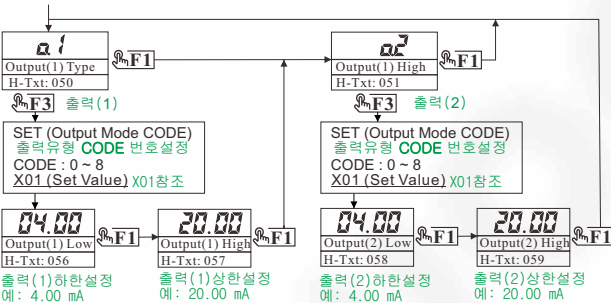
### Setting CODE number (CODE 번호)

200	Output Type & Output range (mA, V) [ OUTPUT-1, 2 ]
210	Display range to output [ OUTPUT-1, 2 ]
800	Calibration Analog output [OUTPUT-1 (0~20mA)]
810	Calibration Analog output [OUTPUT-2 (0~20mA)]

- 실행할 CODE 번호 (0000) 취소 (cancel)
- (200) 출력유형 및 범위 설정 (예:4.00-20.00)
- (210) 출력할 표시범위 설정 (예:0.0-100.0)
- (800) 출력(1) 교정 (0%(0mA)~100%(20mA))
- (810) 출력(2) 교정 (0%(0mA)~100%(20mA))

### 200 Output-Type & range (mA, V) 출력유형및범위

**F1(Hold)>3sec. X05 (Exit)** (200)출력유형 및 범위설정 **F1** [3초이상누름]-복귀X05참조



출력설정(예:출력1 또는 출력2)  
**F1** [3초이상누름]-복귀X05참조  
**F1** [클릭]-다음메뉴  
**F3** [클릭]-선택(값변경)X01참조

출력유형 CODE 설정(0~8) X01참조  
출력범위 설정(예: 4.00mA~20.00mA) X01참조

**X01 (Set Value)**  
값 설정(값변경)

-1999~+9999

**F1** Next Digit 다음 자리  
**F2** Inc. Value 숫자 올림  
**F3** Set END 설정 완료

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**X05 (Exit)**  
메인 복귀

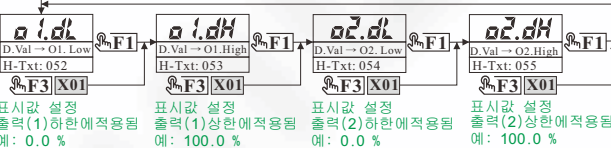
**F1**  
Press & hold > 3sec. 3초이상 누름

DISPLAY (표시)  
0.00

SAVE & RUN (MAIN)  
저장 및 복귀

### 210 (Display range to output) 표시치의 출력할범위

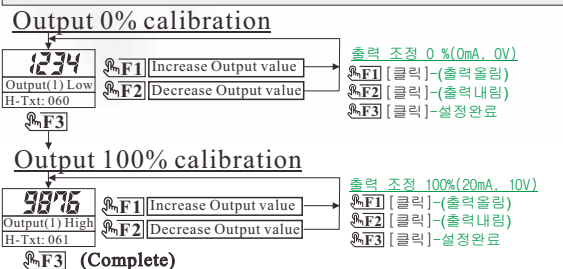
**F1(Hold)>3sec. X05 (Exit)** (210)표시값의 출력할범위설정(예:0.0-100.0) **F1** [3초이상누름]-복귀X05참조



\*\*범위 출력 [Range output]  
**F1** [3초이상누름]-복귀X05참조  
**F1** [클릭]-다음메뉴  
**F3** [클릭]-선택(값변경)X01참조

### 800 (Calibration Output-1) 출력(1)

### 810 (Calibration Output-2) 출력(2)



\*\*Check output value with DM. (DM으로 출력값 확인)

### Help text in display (H-txt: 000)

- [050] Set Output-1 Type(mA,V)
- [051] Set Output-2 Type(mA,V)
- [052] Display value for output-1 Low (The output range is within display range)
- [053] Display value for output-1 High (The output range is within display range)
- [054] Display value for output-2 Low (The output range is within display range)
- [055] Display value for output-2 High (The output range is within display range)
- [056] Output-1 Low Range in (mA or Voltage)
- [057] Output-1 High Range in (mA or Voltage)
- [058] Output-2 Low Range in (mA or Voltage)
- [059] Output-2 High Range in (mA or Voltage)
- [060] Calibration output LOW to process value 0%
- [061] Calibration output HIGH to process value 100%